ARTIFICIAL INTELLIGENCE A SUPER POWER

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Outcomes of Best Practices in Classroom Research

About the Book

It is a fact that Teaching and Research are interwoven. Every potential teacher is a researcher and their classroom is a platform to execute their innovation in research. Students of such teachers are gifted as they too are involved in the process of research either as a sample or as a co-investigator. This book is one such evidence that portrays the outcome of classroom research in the form of theoretical research. The students were exposed to collect knowledge about the recent advancement in Engineering and Technology from authentic academic portals and fragment them in a standard framework. Even if the subheadings are common, the literature review conducted against each subheading is different from person to person. Gathering resources, following a unique way of writing and understanding the nuances of academic writing by the budding engineering students are the learning outcomes of the whole process. Though faculty assistance played a key role in organizing the whole process, the students demonstrated enthusiasm and incessant thirst to acquire knowledge.

"Keep your dreams alive. Understand to achieve anything requires faith and belief in yourself, vision, hard work, determination, and dedication. Remember all things are possible for those who believe".

Gail Devers

OUTCOMES OF BEST PRACTICES IN CLASSROOM RESEARCH

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ARTIFICIAL INTELLIGENCE AND ITS APPLICATIONS THAT ARE CHANGING THE WORLD

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What is Artificial Intelligence?

[1] It is basically the science of developing smart machines in the form of different computer programs. It is related to making computer so intelligent that they can understand humans but it does not mean that they should also be biologically related to human.[2] Artificial Intelligence is the ability of digital computers to solve problems that are associated with high thinking ability which cannot be solved by human beings at the present time.[3] AI is a field of computer science that allows us to create intelligent machines that behave like humans, think like humans and make their own decisions. Artificial intelligence is composed of two words, artificial which defines artificial things and intelligence which expresses the ability to think for oneself, so artificial intelligence is "artificial thinking power". This field was founded on the idea that someday machines will be able to think, that is, they will be able to reproduce intellect and intelligence, along with consciousness, the functions that make us human. It may sound like science fiction or a concept of a new era, but in fact there are references to them in myths as well as other text, scriptures, and artefacts. Artificial Intelligence is not just a turning point in the field of research but also in the revolutionary industry and work as we know it today. With the ultimate goal of creating consciousness, AI goes through different stages: planning, reasoning, data analysis, predicting outcomes and acting accordingly. Artificial Intelligence includes the use of statistics and probability, as well as many mathematical tools (neural networks and machine learning are mostly based on them).

History of AI

[4] Artificial intelligence (AI) missions start with dreams, like all missions. People have long imagined machines with human capabilities - automatic cars that move and the devices that work for it. Human-like machines are depicted in many stories and depicted in sculptures, paintings and drawings. You may be familiar with many of them, but let me mention a few. Homer's Iliad speaks of self-propelled chairs known as "tripods" and gold "carts" built by Hephaestus, the lame blacksmith god, to help him move. Metamorphosis, Pygmalian sculpts an ivory statue of a beautiful young girl, Galatea, which Venus brought to life. [5] In 1847, George Boole became the first person to describe formal language for logical reasoning. In 1950, Alan Turing gave a theory to check software's intelligence. According to his theory any software is considered intelligent if a human being talking to it cannot predict whether he is talking to a computer or a person. This test was called the Turing test. [6] People realized that the intelligent machine is an idea whose time has come, and it is not only this computer that presents a vehicle with which such a dream can be realized. There is a constellation of events, most notably the change from the dominant model, the energy physicist's concept, to a new model, the cybernetics' concept, and has constant efforts to describe psychology and biological phenomena mathematically. Because of these convergence points, a young associate professor of mathematics at Dartmouth College named John McCarthy, who had been fascinated by these questions for quite some time, suggested for his friends that real

progress can be realized if only everyone is solving these problems. Those three friends, Marvin Minsky, another young researcher were Harvard Junior Fellows in Mathematics and Neuroscience, Nathaniel Rochester, director of information studies at the IBM Research Centre in Poughkeepsie, N, Y., and Claude Shannon, then, a mathematician at Bell Laboratories who was heavily involved in the model transformation from energy to information, agreed that perhaps it was it's not a bad idea , and together with McCarthy submitted a proposal to the Rockefeller Foundation for "a study of ten two-month-old men on artificial intelligence conducted in the summer of 1956 in Dartmouth College in Hanover, New Hampshire. Research must be conducted on the basis of conjecture that any aspect of learning or any other characteristic of intelligence can in principle be described precisely so accurate that could bring a machine to mimic". This is the first time the term artificial intelligence has been officially used. Work going on in this area, he has promoted the term and despite several other proposals and one number of grumbles, artificial intelligence is still blocked. In addition, others made short visits to talk about related work. Among those visitors were Alex Bernstein, then programmers from IBM in New York City were invited to talk about the chess program he was working on, which would receive a lot of the public then, causing IBM, people to fear that the idea of smart machines was so threatening that it would deter customers from buying computers.

Growth of AI

[7]Artificial Intelligence is growing rapidly as a factor of competitiveness and is being used by large companies rapidly. It cannot be confined only to individual companies but also has a high potential to contribute in national economy system. [8] Artificial intelligence (AI) is considered as the Fourth Industrial Revolution. Artificial intelligence with big data has changed all industries around the world. Artificial intelligence refers to the simulation of human or animal intelligence in a computer system, thinking of it as an intelligent entity and programmed to mimic the behaviour of the intelligent entity. Computer systems with programmed intelligence can solve a variety of real-world problems much more accurately and efficiently than deterministic and hard-coded computer systems. AI plays an important role in solving problems in the business world, as many problems in business and business analytics cannot be solved by the deterministic system. Machine learning and deep learning, a subset of the realm of AI, solves and optimizes many business issues such as marketing, Credit card fraud detection, algorithmic trading, customer service, portfolio management, product recommendation and many more. AI and big data revolutionized the business world.

AI in Healthcare appliances

[9] The experts observed that out of more than 50 patients per day, which can be very debilitating for people considering the amount of advice and information needed for people. Unlike physicians, AIs are not episodic by number of patients, hours of work, and are redundant in duties. AI helps doctors assess how dangerous a patient's health is and then uses intelligence to not only develop quality of care, but also observe and advise patients on the effects side effects of certain drugs. The global impact of AI is very challenging, with high-tech developed tools to improve decision making, disease detection and management of diseases such as chronic diseases and acute diseases. Doctors and other medical professionals use AI for more accurate diagnosis. In medicine, AI uses arithmetic algorithms as well as human body data science to diagnose, better than doctors can do. This gives professionals the ability for to take immediate action on illnesses that could become serious. Health

systems need to be understood about the variety of systems that are heterogeneous, distributed and common, speak different languages, integrate medical devices and are personalized by different entities, respectively identified by people living in different contexts and aiming for different goals. Analysis of tests, X-rays, CT scans, records entry and different habitual obligations can all be achieved much quicker and with extra precision via way of means of robots. Cardiology and radiology are regions where the quantity of records to bear in mind can be overwhelming and tedious. Future cardiologists and radiologists ought to bear in mind only the maximum complicated cases for which human tracking are useful. IBM got here up with any other set of rules called Medical Sieve. It is a bold long-time period investigative project that targets to create the subsequent technology of "cognitive assistants" with analytical and reasoning competencies and a variety of medical knowledge. Medical Sieve is certified to aid medical choice making in Radiology and Cardiology. The "cognitive fitness assistant" is that may test X-ray pictures for markers and discover complications quicker and greater reliably [10] AI is nowadays been used in the orthognathic surgery as intra-oral scanner software which helps in faster and more efficient acquisition. Also the use of AI in 3D radiology improves the signal to noise ratio and gives a higher quality image which eventually helps to lower the doses of radiations.[9]Artificial Intelligence is being used in machines like echocardiograms, MRIs, CT scans, etc to test screening results. It helps to measure the accurate working and analysis from the beginning till the end of the healing process. [11] AI devices mainly divide into two main categories. The first category includes machine learning (ML) techniques that analyze structured data such as imaging, genetics, and EP data. In medical applications, ML procedures attempt to group patient's characteristics or infer probability of disease. The second category includes natural language processing (NLP) takes information from the unstructured data like medical journals to complete and enrich structured medical data. NLP procedures are used for converting text into machine-readable structured data, which can then be analyzed using ML techniques.

AI in Manufacturing and Production

[12]Smart technologies like Internet of Things, Cloud Computing, Big data and Cyber-Physical systems lead to the emergence of intelligent manufacturing as a new version of Smart manufacturing. [13] Modern production and logistics systems are supported by increasingly widespread and powerful computer networks. In these networks, the constant ocean of data is generated by sensors, machines, systems, smart devices, and people. With increasing computing power, this Big Data is being analyzed faster, wider and deeper than ever before. These advancements have redefined the value of artificial intelligence (AI) technologies and ushered in a new era known as Industry 4.0 or Smart Factory. Advanced cognitive computing and deep learning methods have begun to find applications in manufacturing systems for automated visual inspection, fault detection, and maintenance. Active efforts are being made to apply reinforcement learning methods to material handling and production planning systems. Industries that hope to transform real-time data into actionable decisions are looking for opportunities to integrate AI methods with traditional operations research approaches, concepts and technologies Internet of Things (IoT) as well as network physical systems. [14]AI technologies could assist the production planner in choosing the best production process which not only reduces the cost of production but also increases the quality and efficiency of the production process. It also helps to build an intelligent system which automatically adapts the process parameters according to changing conditions. [15]

Intelligent method designing may be a dynamic and sophisticated activity. Method designing provides a close description of manufacturability and needs for changing raw materials stock into finished product. Intelligent method designing includes computer-aided process planning (CAPP) and layout of facilities and locations. Method designing is that interface between Computer-Aided Design (CAD) and Computer-Aided Manufacturing (CAM). CAPP is important in achieving the final word goal of totally integrated factories within the future. The CAPP system contains an outsized quantity of data as well as rules for organization of machine operations and factual information concerning the shop. Inventory management is additionally thought of during these sections as a result of palmy inventory management is important to palmy producing and needs refined strategies for handling dynamical surroundings. The literature is choked with articles on freelance theoretical models of demand inventory; however it lags behind these developments. AI will play a very important role in serving to practitioners implement such models and conjointly overcome the issues related to large-scale inventory management.

AI in Security and Surveillance

[16]Michael Rogers', the director of National Security Agency (NSA) said that the agency sees AI as the foundation to the future of cyber security. In December 2016, DRDA held a head to head fight challenge between autonomous machines. Each machine was capable of automatically finding and making use of cyber vulnerabilities in its opponents and at the same time mending its own vulnerabilities and protecting itself from external cyber attacks. As a result of this tournament DoD began the 'Project Voltron' to develop such systems to scan and patch vulnerabilities in the U.S. military. [17]Activities such as Advanced Persistent Threat operations, which are currently more labour intensive in the coming times, may become largely automated and easily available on the black market with the increasing development in AI. [18] The application of AI- based techniques has great potential to boost the security and potency of data-driven Intelligent Transportation Systems (ITS) further as new services and rising of the Internet of Vehicles (IoV). This text discusses the sensible implementation of deep learning strategies to reinforce safety and security in very specific ITS scenarios such as railway crossings. This work presents the projected system named Artificial Intelligence-based Surveillance System for Railway Crossing Traffic (AISS4RCT). It supports a mixture of detection and classification strategies and specializes in numerous image processing inputs such as vehicle presence, pedestrian presence, vehicle chase, rail barriers at level crossings, scene railway signals and signal fire system. The system is meant to use properly positioned cameras to capture the complete crossing space at a given intersection. By utilizing GPU-accelerated image process and deep neural networks, the system mechanically detects risky and dangerous things at railway crossings in real time. Additionally, camera modules send information to a central server for additional process further as notification to interested parties like police, emergency services and railway operators. In addition, the system design uses privacy and security based practices deliberately to secure all communication interfaces, shield personal information and increase everyone's privacy, i.e., pedestrians and motorists.

Artificial Intelligence in Education

[19]Intelligent Tutoring Systems (ITS) uses artificial intelligence technologies to stimulate individualized human learning and provides educational activities that best match the analytical needs of the learner. In addition to this it also provides targeted and timely feedbacks without the presence of any individual faculty. Some ITS put learners in control of their own learning to help

students develop self-regulation skills; others use instructional strategies to extend learning so that learners are appropriately challenged and supported. For example, BUGGY, a revolutionary system designed to teach basic addition and subtraction, used a model of possible misconceptions that learners could present among learn their procedure. This "error library", is in fact the system's domain model, used to diagnose any student errors so that appropriate tutoring can be provided**.** Modern model-driven adaptive systems can be much more flexible. They allow the rationale for all system decisions to be made unambiguously and understandable by humans (and thus applicable to classroom instruction). Over the past decade, increasingly complex learner models, pedagogies, and domains have been introduced into many adaptive tutors to support personalized learning. For example, the iTalk2Learn system, designed to help young students learn fractions, used a learner model that included information about math knowledge, cognitive needs, status affective (emotional) state, the feedback they receive, and their reaction to those comments**.** [20]Intelligent Tutoring Systems (ITS) offers great flexibility in the presentation of material and has a good ability to respond to the individual needs of the student. These systems achieve their intelligence by representing the decisions about how to teach a particular student as well as gives information about the learner. This allows great diversity by changing the way system interacts with the student. [21] Squirrel a famous company in China uses AI in education. For every course that the company offers, the engineering team works with a group of master teachers to break down the subject into the smallest possible conceptual pieces known as knowledge points. The purpose is to diagnose the student gap in understanding as accurately as possible. Once knowledge points are established, they are paired with video presentations, notes, edited examples and exercises.

Advantages of AI

[22] Artificial intelligence (AI) applications are used to simulate human intelligence to solve a problem or make a decision. AI provides the benefits of permanence, reliability, and cost-effectiveness while addressing uncertainty and speed in solving a problem or making a decision. AI has been used in fields as diverse as engineering, economics, linguistics, law, manufacturing, and medicine, and for a wide range of modelling, prediction, and decision support applications, regulation and control. One of the most promising applications of AI has been rigorously used on the Internet, as well as in search engines. In an organization where human intelligence is tied to a particular person or to a group of people, AI applications can provide the permanence that knowledge is not lost as individuals or group members retire or are no longer available to the organization. The lifespan of knowledge encapsulated within an AI framework can be extended as long as the relevance of the problems and decision scenarios remains unchanged. AI also enables the development of learning capabilities that can be used to extend the life and relevance of applications. Learning from real-world successes and failures is an enabling trait of application tools. AI is called "reinforcement learning" and has the advantage that it increases the reliability of tools as they are used more in applications. [23] AI already has many applications in the medical field such as online bookings of appointments for various doctors, online check-in at the medical centres, digitization of medical records, follow-ups for booking and even vaccination reminders for children and pregnant women. It is also being used to give warnings of the side effects to the doctors when prescribing combination of several medicines. [24] One of the great things about Artificial Intelligence is that it makes decision based on facts and not on emotions. It is a much known fact that even after our best efforts; human decisions are always adversely affected by the emotions. [25] The area of robotics is often referred to as the sub-area of AI that deals with perceptual and motor tasks. A robot is a mechanical device that performs an automated task under the direct supervision of a human being, under a predefined program, or under a set of common guidelines using artificial intelligence technology. [26] Today, as clients become more sophisticated and knowledgeable, they

prefer to make financial transitions with less human interactions. The technical field is much broader and has the potential to improve the overall efficiency of the financial system. One of the most popular tools is the smart contract, a computer program that can execute contract terms (Idelberger, Governatori, Riveret & Sartor, 2016). Fully automated smart contracts can complement or completely replace common legal contracts. This is clear as Smart contracts are becoming increasingly important in multiple industries such as healthcare, real estate and securities. There are about possible uses for banking systems, insurance, management, etc.

Disadvantages of AI

[27] Artificial Intelligence makes people lazy because applications automate most of the work. People tend to push themselves into these inventions, which can weigh on future generations. Since AI replaces the majority of repetitive tasks and other jobs with robots, with less human intervention, which can be a significant problem in usage standards. Every organization seeks to exchange the minimum number of skilled individuals with AI bots that can do the same job more efficiently. There is no doubt that machines are much better when it comes to efficiency, but they cannot replace the human connections that make up the team. Machines cannot bond with humans, which is an important attribute when it comes to team management. Machines can only perform the tasks for which they were designed or programmed to attempt; anything they tend to fail or produce irrelevant outputs can be a context of serious scene**.** [28] The high cost of developing AI-based applications can mean that the first impulse comes from the private sector. Needless to say, businesses can earn revenue from areas with large profit pools without having to deal with socially relevant issues such as equal access. [29] Given all the possible events in the real world, big data learning takes a long time, so AI is usually limited to one frame or type of problem. For example, if we limit the algorithm to only applying to chess, image recognition, or speech, we can only expect specific results. However, in the real world there are infinite possibilities that we have to anticipate when trying to handle all phenomena, so database overload will make the search time infinite. [30] One of the ethical dilemmas that can be identified is the issue of unemployment. The development of specialized machines has led to the fact that more and more workplaces have been replaced from the Industrial Revolution to the present. Starting with less skilled and repetitive task that requires little reasoning to perform to even surgical precision and more complex tasks are being replaced by economically more efficient machines. [31] Computers cannot handle unexpected situations. For students, the learning environment is diverse and constantly changing. Due to the limitations of computer artificial intelligence, computer technology does not respond to students' unexpected learning problems as teachers do and also does not immediately answer students' questions.

Conclusion

From the above discussion, we can see that artificial intelligence technologies make human's life easier and that by, future artificial intelligence technologies may bring greater competitive advantage. In this way, Artificial Intelligence can make great discoveries and breakthroughs for mankind thanks to its many capabilities. Most of the AI systems are capable of learning, which allows people to improve their performance over time. Evidence shows that AI can bring real added value to our lives. AI works on the basis of accessing huge amounts of information, processing it, analyzing it and, according to its operational algorithms, performing tasks to solve certain problems. Finally, during this research, we went through AI definitions, brief history, growth of AI, AI in healthcare appliances, AI in security and surveillance, AI in education, some advantages and disadvantages of AI. This is not the top of AI, there is more to learn, who knows what AI can do for us in the future maybe that will be a whole robotics company**.**

References

Abdulov, R. (2020). Artificial intelligence as an important factor of sustainable and crisis-free economic growth. Procedia Computer Science, 169, 468-472.

Allen, G., & Chan, T. (2017). *Artificial intelligence and national security*. Cambridge, MA: Belfer Center for Science and International Affairs.

Amisha, P. M., Pathania, M., & Rathaur, V. K. (2019). Overview of artificial intelligence in medicine. Journal of family medicine and primary care, 8(7), 2328.

Beck, J., Stern, M., & Haugsjaa, E. (1996). Applications of AI in Education. *XRDS: Crossroads, The ACM Magazine for Students*, *3*(1), 11-15.

Benko, A., & Lányi, C. S. (2009). History of artificial intelligence. In Encyclopedia of Information Science and Technology, Second Edition (pp. 1759-1762). IGI Global.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages of Artificial Intellegence. Aayushi International Interdisciplinary Research Journal, 227-230.

Bouletreau, P., Makaremi, M., Ibrahim, B., Louvrier, A., &Sigaux, N. (2019). Artificial intelligence: applications in orthognathic surgery. Journal of stomatology, oral and maxillofacial surgery, 120(4), 347-354.

Charniak, E. (1985). *Introduction to artificial intelligence*. Pearson Education India.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Ertel, W. (2018). Introduction to artificial intelligence. Springer.

Ghimire, A., Thapa, S., Jha, A. K., Adhikari, S., & Kumar, A. (2020, October). Accelerating business growth with big data and artificial intelligence. In *2020 Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC)* (pp. 441-448). IEEE.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., & Scharre, P. (2018). *Artificial intelligence and international security*. Center for a New American Security..

Jiang, F., Jiang, Y., Zhi, H., Dong, Y., Li, H., Ma, S., ... & Wang, Y. (2017). Artificial intelligence in healthcare: past, present and future. *Stroke and vascular neurology*, *2*(4).

Kalyanakrishnan, S., Panicker, R. A., Natarajan, S., & Rao, S. (2018, December). Opportunities and challenges for artificial intelligence in India. In Proceedings of the 2018 AAAI/ACM conference on AI, Ethics, and Society (pp. 164-170).

Knox, J. (2020). Artificial intelligence and education in China. *Learning, Media and Technology*, *45*(3), 298-311

Lai, C. C., & Kritsonis, W. A. (2006). The advantages and disadvantages of computer technology in second language acquisition. *Online Submission*, *3*(1).

Lu, H., Li, Y., Chen, M., Kim, H., & Serikawa, S. (2018). Brain intelligence: go beyond artificial intelligence. *Mobile Networks and Applications*, *23*(2), 368-375.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education.

Mayr, A., Weigelt, M., Masuch, M., Meiners, M., Hüttel, F., & Franke, J. (2018). Application scenarios of artificial intelligence in electric drives production. Procedia Manufacturing, 24, 40-47.

McCarthy, J. (2007). What is artificial intelligence?

McCorduck, P., Minsky, M., Selfridge, O. G., & Simon, H. A. (1977, August). History of artificial intelligence. In IJCAI (pp. 951-954).

Meziane, F., Vadera, S., Kobbacy, K., & Proudlove, N. (2000). Intelligent systems in manufacturing: current developments and future prospects. *Integrated manufacturing systems*.

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In *Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi*.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Nilsson, N. J. (2009). *The quest for artificial intelligence*. Cambridge University Press.

Rahim, S. M., Mohamad, Z. Z., Bakar, J. A., Mohsin, F. H., & Isa, N. M. (2018). Artificial intelligence, smart contract and islamic finance. *Asian Social Science*, *14*(2), 145.

Sikora, P., Malina, L., Kiac, M., Martinasek, Z., Riha, K., Prinosil, J., ... & Srivastava, G. (2020). Artificial intelligence-based surveillance system for railway crossing traffic. *IEEE Sensors Journal*.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Tao, B., Díaz, V., & Guerra, Y. (2019). Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher. *Arctic Journal*, *72*(12), 30-50.

Yao, X., Zhou, J., Zhang, J., &Boër, C. R. (2017, September). From intelligent manufacturing to smart manufacturing for industry 4.0 driven by next generation artificial intelligence and further on. In 2017 5th international conference on enterprise systems (ES) (pp. 311-318). IEEE.

ARTIFICIAL INTELLIGENCE: A PILLAR OF
THE MODERN SOCIETY

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What is AI?

[1] Artificial engineering is a branch of computer engineering which deals with the study and creation of intelligent computer programming. It refers to the concept of using computer intelligence in a similar way as human intelligence works which does not have to be bounded by any biological processes. Rather than studying people or animals, AI refers to the study of problems the world faces in terms of intelligence. AI is used to solve the errors and defects than exist in the system. AI helps in developing a more luxurious lifestyle. AI researchers are provided with complete freedom to use any method that are not observed in people or which are strenuous for human intelligence. AI researchers are provided with the problems in which they can develop a certain AI system which will help in solving the issue. The use of human intelligence to create and amend AI system is core of the development of AI system. [2] Artificial intelligence in a way is the evolution of thinking process which can be achieved through computational techniques. AI is not bounded by any general behavioural pattern associated with any mental faculty, it calculates all possible paths to the results and generally doesn't stick to ways that human intelligence takes. AI works on facts rather than emotions, this helps in the development of a more rational system. [3] The emergence of Artificial intelligence in the modern times is considered as the fourth industrial revolution. Artificial intelligence is made to process huge amount of data so as replicate human intelligence in a vast scale. Programmed intelligence made by computational systems are more efficient and accurate in the society. According to certain studies,systems fused with AI software are seen to be more efficient.

History of AI

[4] Ever since the end of WWII, independent works on intelligent machines increased rapidly. Alan Turing an English mathematician was the first to get this started. In 1947 he delivered a lecture on it. The idea of AI being better researched by programming computers than building machines may have been decided by Alan Turing. The number of AI researchers flourished by the late 1950s and most of them based their works on programming computers. [5] The game chess is an enterprise that involves a lot of thinking process. The machines built to play chess, especially "the Turk", was presented as intelligent machines which managed to fool people into making them believe that the machines played autonomously. In a newspaper column, Samuel L. Clemens ("Mark Twain") wrote that the Turk has to be machine as it played so well! During the early years of AI establishment, for the study of inference and representation mechanisms, chess was considered as a driving force for it.

Growth of AI

[6] The advancement of evolutionary algorithms was highly significant in the last decade in such a way that in many areas of science and engineering, human-competitive results were able to be

achieved which included evolution in the design of antennas, photonic crystals, search heuristics and quantum computer algorithms. With the incorporation of deep understanding of recent biological advances most of these results were achieved. Whenever a certain issue is addressed in a problem, further upgradation of the system is done to improvise it, this leads to the advancement of the system and the algorithm which it uses. As AI evolved over the course of time, people became more and more interested in it, this led to further research of this field. The use of human intelligence to develop an AI system which is more effective than the human intelligence is the main motive of the AI researchers. [7] In order to tackle global crisis, there is a necessity of an AI system that can stabilise the inter sectoral system which can build an effective bond between the planning entities. Economic law's reflection is involved during the construction of such a system. Introduction of AI with these measures to the strategic planning system will clear a path in the reproduction of a national economy, an easing quantitative policy or a stimulant method can lead to an undue of capital present in the sector, etc. The successive establishment of many individual start-ups in this field has led to better economy as well as people begins to take more interest in the field.

AI in Healthcare Appliances
[8] Health care system is being rapidly changed by artificial intelligence. With the help of comparison of big data and strong machine learning methods developers have begun to introduce more tools in the field of clinical care to advanced medica research to improve their efficiency. Programs created from former health care data which helps in predicting and recommending advanced data rely on the different algorithms. But most of the times these algorithms are too complex to be explained easily. Such algorithms are sometimes termed as "Black-box". [9] Some of the research study suggests that AI is as efficient or more efficient than humans at major healthcare events, including diagnosing a disease. In today's time algorithms have already surpassed radiologists in identifying malicious tumours, and suggests methods on how to build cohorts for expensive clinical trials. Though, for a lot of reasons, it will take many years for AI to replace humans in the domain of healthcare which consists of wide medical processes. In machine learning, the most complex form is deep learning or called neural networking. It involves a number of variable as well as different levels which predict the correct outcomes. In such models, there exists many different kinds of hidden features which can be uncovered with the use of many different graphic processers and cloud-based architectures. The deep learning system is used in the radiology images, where cancerous lesions can be discovered. The fusion of deep learning and radiology provides better accuracy in the analysis of radiology images. Deep learning or neural networking system is also used in the speech recognition.[10] The usage of robotics has drastically increased in medical all over the world. The non-invasive technology is highly supported by the robotics, which Is the major reason why robotics is so efficient in the surgical rooms. In other domains, because of their demanding accuracy rates surgeries with the help of robotics can be aid to be minimally invasive, on the other hand human surgery compels doctors to create notch which may take a long time to heal and it can be painful. Unlike human specialists, robots are capable of using miniaturized surgical equipment. A surgeon will be able to control all these machines with the help of AI from a console.

AI in Manufacturing and Production
[11] with the help of omnipresent strong computing networks, modern production and manufacturing systems can be highly supported. Inside these networks, a high amount of data is generated with the help of people, system, machines, smart devices, and sensors. These data is being

analysed at high speed, more widely, and with more depth than before with the advancement in computational capabilities. Smart factory or Industry 4.0 is termed as the new age of industry because of the advancement in AI technologies. [12] within the intelligent manufacturing system, AI is applied into this field. It does not make sense of AI being used beyond intelligent manufacturing system. Intelligent manufacturing system most of the time is characterized through learning, cognition, analysis, interconnection, control, decision making, autonomous intelligent sensing and the implementation of human, environment, material, machine and data about the whole system. The system contains a lot of domains such as security management, cloud computing, resource layers, as well as a well-established service platform. [13] In terms of the manufacturing industry, innovation along with adaptation are two aspects which play a very important role. This kind of evolution using the modern technologies will lead to sustainable manufacturing of goods. In order to promote sustainability, intelligent production execution technology of global views is required for smart production. Because of intensive research methods in the domain of artificial Intelligence, a large number of AI consisting methods, for example machine learning, to achieve sustainable manufacturing in the industry these methods have already been adopted.The process of innovation and adaptation with the help of AI has more efficient.

AI in Security and Surveillance
In the recent years the senior leaders have already expressed that the cyber domain is a field which contains a prominent potential usage of AI. On October 2016, Michael Rogers the director of National Security Agency (NSA) stated that their agency sees artificial intelligence as "foundational to the future of cybersecurity". Roger made his remark two months after the Cyber Grand Challenge which was hosted by the DARPA, which is a head-to-head competition between machines of the cyber domain. In the event each system was able to discover and exploit each other cyber vulnerabilities while overcoming its own vulnerabilities and protecting its own system from external cyberattacks automatically. The DoD was impressed from the tournament and launched a new program named Project Voltron, in order to develop and execute cybersecurity systems which can scan and fix any vulnerabilities from the U.S. military system. The major challenges of the counter-illicit-financing's can be solved with the help of AI since it is more efficient than human intelligence. In the past the systems only used human intelligence. This led to many threats and crimes go unsolved or undiscovered.[15] Human intelligence is incapable of processing huge amount of data while on the other hand AI is capable of doing it in a more efficient manner. AI has a huge scope for optimising the fight against crimes and uphold the national security. Human intelligence is biased and favours emotions over facts. In a situation where a fast and steady decision is to be made due to the accumulation of unimaginable information, making the use of AI would solve the problem.There are a lot of time-consuming processes such as drafting of verified decisions, multivariate events, rapid processing of large data, forensic science, counterintelligence, and creation of plans to counter the problem. AI's use can significantly increase the time efficiency required for these processes and can lead to detecting and preventing crimes in a faster manner. [16] With the introduction of Artificial intelligence, cybersecurity is of the field which will be benefited largely. In the events where conventional security will be insufficient, techniques of artificial intelligence can improvise the total security system's performance and efficiency by protecting the system from a large number of autonomous cyber threats.

AI in Education

[17] The domain of education is largely concerned of the development of Artificial Intelligence techniques to facilitate the study based human teaching and systems of engineering. Questions which existed for a long term are addressed by this field such as, how will the system facilitate the learning process and measure the progress of learning. Within the discipline of engineering, 'intelligent tutoring system (ITS)' is a term which is frequently used. AI activities like dialog management, explanation, control, planning, knowledge representation and acquisition, and cognitive modelling is supported by the computational methods. Alternate theories related to learning are also explored and evaluated using computational models. Advanced teaching systems with vast knowledge about the field, advanced ability to note the behavioural pattern of students, increase in the reason ability regarding the selection of topic and the generation of all kinds of responses are the factors which motivates the research of the domain of artificial intelligence in education.[18] Over more than 20 years computer are largely used in the domain of education. Computer-based training (CBT) along with computer aided instruction (CAI) were one of the first such systems which were developed as a computer teaching instrument. In these systems, the instructions were not recommended according to individualized needs. Both CBT and CAI are effective in computational learning but it doesn't provide individual attention to students. This led to the establishment of Intelligent tutoring system (ITSs). ITSs provides an extra edge by responding to the idiosyncratic needs of the students. This provides higher versatility by upgrading the interaction session with students. [19] Artificial intelligence (AI) is perceived as a solution to the current existing problems in the field of education. Even though some of the sociologists gives deterministic arguments about this, AI solutionists are gaining an over hand on the issue. Through the methods of knowledge graph, bourdieusean theory and novel technique of sociology, educational stakeholders and technologists are valorising artificial intelligence. Considering all these, an argument can be made that the mobilization of AI is done in the educational domain in a problematic manner and we can advocate for another ordered sociological system and improve the domain so that it can account for the society's better improved structure.

Advantages of AI

[20] Organizations which rely on a person or a group of people, AI provides an edge by continuing the circulation of knowledge even if a person retires or the organization is no longer available. To reelevate the application and to extend its life period, AI can be utilised to the development of the learning capabilities. "Reinforcement learning" is a tool that enables AI learning from the success and failures in real life and the increased use of this tool has increased its reliability too. The significant amount of time taken by the staff can be minimised in an agency in process which includes decision making with the help of AI applications. [21] The fact that AI makes its decision based on facts and not on emotion is a major advantage it provides. No matter what we do, it is a fact that decisions made by humans ends up effecting in a negative manner because of our emotions. Artificial intelligence is a step above in terms of efficiency of the work done. AI does not need the requirement of sleep to easy themselves, on the other hand human intelligence has a certain limit to continuously it can work. The process of making a machine learn a certain task with the help of AI is pretty easy, we just have to copy the training data into it. [22] AI can be relied on to the work chich may be too complex and stressful for human mind and body. Most likely the tasks done by AI can be done pretty much faster than what could have been done with the help of human intelligence.

AI can be used to research on areas which are too difficult for human body to reach, such as the outer space. The chance of getting an error or defect is less in can of AI. The functions which can be made is infinite and it is not bounded by anything.[23] With the deployment of edge nodes in 5G network systems, the process of edge computing has gained the advantage by the reduction of work load and backhaul pressure, though edge-based devices still face the problem of real time processing. The emergence of edge cognitive computing system has led to being recognised as a new paradigm. With the more applications of more intelligent cognitive services, the process of creating and predicting the new data can speed up for the intelligent machines, thereby interpreting the available information in the cyberspace.[24] For the seismic risk assessment, the realistic prediction of earthquakes is very critical for the prevention of major damage by providing safe design for the important structures. It is a really challenging task to correctly identify the response of the earthquake due the complex nature of the seismic events. AI has been used as a powerful tool as it provides a statistical advantage over the issue. This task involves the processing of massive collected data with the help of several noise enhanced processes. AI helps in identifying data which may be unknown to the human intelligence in order to correctly pinpoint the accurate data for the seismic activity. [25] In these times the greatest example of advantage of AI is smartphones. With the help of many different AI assistants in smartphones these days the workload on humans has decreased. AI helps in the reduction of risk for human life, in the scenarios of an earthquake or a fire brokage, modern machinery with the help of AI can react to the situation in a way that is risky for humans with ease. The everyday life of humans has become more luxurious with AI. According to a research it has been found that AI helps in the prevention of depression among people by providing them with some sort of entertainment.

Challenges or Dis-advantages of AI

[26] In the article by Van Zuylen, one of the major criticisms towards AI is regarding the black boxes which only merely attempt to seek a relationship between the input and the output, and they are solely based on training data manual. AI-based searching methods have another limitation which focuses on genetic algorithms rather than colony optimisation, is that it never guarantees to reach for a "Optimal solution". Also, it is often difficult to gain the true insight and nature of the problem which it faces, and it is possible during for example while using mathematical programming techniques. Also, AI is unable to correctly respond to a sensitive analytical task.[27] It is really not an easy task to develop machines which are favourable to our requirement as it is a bit expensive. It may sometimes require a ton of money to just repair or remodel. Also, it is a tedious task to repair robotic machinery. Robotics moulded with AI causes a large amount of unemployment and leads to the downfall of national economy. It is a matter of fear of people as they might lose their jobs in the coming times. AI also leads to an unhealthy lifestyle for the society. [28] AI in the field of medicine is quickly grasping its grip. In December of 2016, a report made by Gulshan et al on the validation and development of an algorithm for the detection in retinal fundus of diabetic retinopathy was circulated. After that an editorial was published by Wong and Bressler, which pointed out the limits of the above-mentioned report, it required further more validation and surety of safety. And it was also difficult to make people believe on a black box. [29]The adoption of AI is assessed in many different contradictory ways in the public sector. There is only a little amount of data to substantiate the benefits while there are a lot of reports on the demerits of AI in this sector. In China, many different stakeholders of different sectors have come together to claim certain empirical based

challenges in the public sector by providing an idea of 4 sets of guidelines which the government have to monitor for the adoption of AI into the public sector.[30] In order to improve the quality of the processing industry smart manufacturing is an essential necessity. In the sector of smart manufacturing, it is a common practise to adapt to different new kinds of technological reforms, due to large amount of usage for dangerous chemicals which leads to the implications of strict safety precautionary laws. The emergence of AI has results in the more problems in this sector as it causes certain errors in the assessment of different hazardous tasks in the industry.[31] A simple error in a code can led to a big problem in its creation. In a complex code consisting of many functions and algorithms, a single text error can stop the entire coding process. Also, the detection of these small errors in the code is a tedious task which requires a lot of time. In the modern times where humans are busy in their own work, AI requires a lot of attention for its creation. AI is incapable of self-processing, an input is required to begin the process, AI is not able to select the most appropriate input from a set of inputs. The creation of AI with the help of another AI is also a complex task. It most of the times leads to malfunctioning of the process.

Conclusion

According to the conducted research, AI can be considered to be an essential tool for the advancement of the human society. In the past AI has helped human kind in tackling many difficult tasks which deemed to be impossible with only the use of human intelligence. AI aided a helping hand by decreasing the time taken for advancement. Human intelligence working along side with artificial intelligence can be seen as the foundation of the modern society. AI helps in pointing out the defects or problems in a domain which leads to the creation of many other AI software. In the field of medicine AI has helped in the detection of cause for diseases also it has helped in the efficient production on medicines and medical machinery. AI has helped in visual education for people. With the introduction of AI in the industry, the rate of production and manufacturing department has skyrocketed. The fusion of AI in the security and surveillance has provided better efficiency. With the further advancement of AI software in the future, it can be said that the future of the human kind will advance in higher manner.

References

Alugubelli, Raghunandan. "Exploratory Study of Artificial Intelligence in Healthcare." *International Journal of Innovations in Engineering Research and Technology* 3.1 (2016): 1-10.

Beck, Joseph, Mia Stern, and Erik Haugsjaa. "Applications of AI in Education." *XRDS: Crossroads, The ACM Magazine for Students* 3.1 (1996): 11-15.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. Aayushi International Interdisciplinary Research Journal, 227-230.

Buchanan, Bruce G. "A (very) brief history of artificial intelligence." *Ai Magazine* 26.4 (2005): 53-53.

Charniak, E. (1985). *Introduction to artificial intelligence*. Pearson Education India.

Chien, Chen-Fu, et al. "Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies." (2020): 2730-2731.

Chowdhury, M., &Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Chowdhury, M., &Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Cioffi, Raffaele, et al. "Artificial intelligence and machine learning applications in smart production: Progress, trends, and directions." *Sustainability* 12.2 (2020): 492.

Davenport, Thomas, and Ravi Kalakota. "The potential for artificial intelligence in healthcare." *Future healthcare journal* 6.2 (2019): 94.

Davies, Huw C., Rebecca Eynon, and Cory Salveson. "The mobilisation of AI in education: A Bourdieusean field analysis." *Sociology* 55.3 (2021): 539-560.

Ghimire, Awishkar, et al. "Accelerating business growth with big data and artificial intelligence." *2020 Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC)*. IEEE, 2020.

Horowitz, Michael C., et al. *Artificial intelligence and international security*. Center for a New American Security., 2018.

Jatobá, Mariana, et al. "Evolution of artificial intelligence research in human resources." *Procedia Computer Science* 164 (2019): 137-142.

Ji, Hongjing, Osama Alfarraj, and Amr Tolba. "Artificial intelligence-empowered edge of vehicles: architecture, enabling technologies, and applications." *IEEE Access* 8 (2020): 61020-61034.

Jiao, Pengcheng, and Amir H. Alavi. "Artificial intelligence in seismology: advent, performance and future trends." *Geoscience Frontiers* 11.3 (2020): 739-744.

Li, Bo-hu, et al. "Applications of artificial intelligence in intelligent manufacturing: a review." *Frontiers of Information Technology & Electronic Engineering* 18.1 (2017): 86-96.

Mao, Shuai, et al. "Opportunities and challenges of artificial intelligence for green manufacturing in the process industry." *Engineering* 5.6 (2019): 995-1002.

McCarthy, J. (2007). What is artificial intelligence?

McCarthy, John. "What is artificial intelligence?." (2007).

Mogali, Shivaranjini. "Artificial Intelligence and its applications in Libraries." *Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi*. 2014.

Osipov, S. S., and N. V. Ulimova. "advantages and disadvantages of ai." *science and world* (2013): 77.

Radulov, Nikolay. "Artificial intelligence and security. Security 4.0." *Security & Future* 3.1 (2019): 3-5.

Sipov, S. S., and N. V. Ulimova. "advantages and disadvantages of ai." *science and world* (2013): 77.

Spector, Lee. "Evolution of artificial intelligence." *Artificial Intelligence* 170.18 (2006): 1251-1253.

Stead, William W. "Clinical implications and challenges of artificial intelligence and deep learning." *Jama* 320.11 (2018): 1107-1108.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Sun, Tara Qian, and Rony Medaglia. "Mapping the challenges of Artificial Intelligence in the public sector: Evidence from public healthcare." *Government Information Quarterly* 36.2 (2019): 368-383.

Wirkuttis, Nadine, and Hadas Klein. "Artificial intelligence in cybersecurity." *Cyber, Intelligence, and Security* 1.1 (2017): 103-119.

Woolf, Beverly. *AI in Education*. University of Massachusetts at Amherst, Department of Computer and Information Science, 1991.

Yu, Kun-Hsing, Andrew L. Beam, and Isaac S. Kohane. "Artificial intelligence in healthcare." *Nature biomedical engineering* 2.10 (2018): 719-731.

A PATH TO IMMORTALITY THROUGH CRYONICS

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Introduction

In ancient times birth and death were solely controlled by nature. But the advancement in the scientific and medical field currently has made it possible to manipulate birth and death by extending life spans. Now science is evolving in such a way that it could probably change the idea of death. Scientists have come up with an enthralling theory of cryonics in which death can be entirely controlled by humans. "Cryo" is a Greek word referring to "icy cold" or "frost". Cryonics is the process by which a human, animal, or any living organism is preserved with the purpose of future revival. The theory of cryonics came into the modern world when the physics professor Robert Ettinger put forward the idea of immortality in his book, "The Prospect of Immortality", which involved preservation by freezing.

Cryopreservation is achieved by freezing the species at extremely low temperatures (as low as -196° C) by encasing them in liquid nitrogen. The low temperature slows down or temporarily halts the chemical reactions in the species which helps in the preservation of tissues in the body. Ice formation, which could be a disadvantage of this process can also be prevented by using vitrification mixtures. Cryonicists hope that in the near future, the biomedical advancements will reach a point where it can cure the species of the conditions that pose a threat to its survival and resuscitate it. Cryonics at first glance might seem like something humanly impossible, but it is completely feasible under biomedical confinements of death. Implementation of this technique has begun and research centres like NASA are currently working on it. Although it requires an extensive amount of research and monetary funds for development, it opens up a wide range of career opportunities for all aspiring minds of the world.

Literary Survey

The concept of cryonics originated from this remarkable book written by Dr Robert C.W. Ettinger, "Prospect of Immortality". Ettinger believed that everyone is going to die and some would die before reaching old ages due to some menacing disease and so to achieve rejuvenation, he came up with the idea of one being suspended in a transient state from which he could be revived again. Technically, the patient is not sleeping, only his metabolic reactions have stopped. When rejuvenated, he will have no idea about the passage of time. The idea of cryonics has itself brought optimism for many people including the researchers and it is expected that the average life expectancy is going to increase by a huge number by the starting of the 22nd century.

Medical science has advanced to an extent where today, we can afford to preserve the body of the dead by rapid cooling of temperature that surrounds him, and reanimate or revive it in the future when the cure for the particular disease has been discovered. This is called cryonics. The process can be started only after the person has been declared "legally dead". Cryoprotectants like glycerol

can control the formation of ice in the brain. The main aim of the whole experiment is that later in the future, these "subjects" can turn into epitomes of "Reversible Death". Their normal body temperature can be restored; damage caused by cryoprotectants can be cured. Similar experiments have been carried out on rabbits and have been successful.

Glycerol was the first chemical used for the purpose of cryopreservation. Robert Ettinger in his the book suggested that glycerol can be used as a cryopreservant. This observation was made when glycerol showed positive results, in the preservation of sperms and tissues. Ettinger asked Dr Dante Brunol to produce a protocol for cryop, reservation. Brunol explains that a body after legal death should not undergo immediate freezing. Reason for this statement given by Brunol is that water after immediate pressurised freezing forms glass and cannot rearrange into crystals. For better cryopreservation purposes, Brunol suggests that a cryonic suspendee after legal death should be augmented with an artificial airway and high fraction of inspired oxygen. Another suggestion made by Brunol in the protocol is that the cryonics patient must be immersed in a tub filled with ice and 10% DMSO in water when mechanical CPR is being carried out.

Cryonics is more of a theoretical crisis than a practical one. The first practical step to cryonics was suggested by Dr Thomas K Donaldson. Donaldson, a cryonicist, was a brain tumour patient. He believed that he could have a life without a tumour in the future and for this, he needed to kill himself. If he waited for longer, more of his brain tissues would have gotten damaged due to the continuous growth of a tumour. Donaldson's arrangements for his cryonic suspension started in 1975 but had to stop as otherwise, his tumour would have grown to a large extent that it would prevent circulation in the brain. Eventually, he died in 2006 without undergoing the procedure. Later, James Bedford, an American professor, became the very first person whose body was cryopreserved after legal death. A person can have chances to survive cryogenically, only if their brain structure remains unaltered. Recent day technology seems to be able to do this, which was not considered possible in the past. Nanotechnology is a dream come true for cryonicists as it is considered to be a key for revival. It not only alters the hazardous effects caused by freezing but also helps in curing the disease that lead to the death of the person.

Since cryonics is done in low temperatures, damages are caused to the body due to ice formation. Such damages can be prevented by a process called vitrification, which involves the usage of cryoprotectants and agents to prevent the formation of ice. Cryoprotectants must not only be powerful but also non-viscous and completely non-toxic. Any cryoprotectant used in vitrification has the toxicity of varying levels which over a period of time can damage the body tissues, neurons, blood vessels, etc. DMSO, glycerol, ethylene glycol, propylene glycol and some other polyols were found to be effective cryoprotectants. But these agents contain toxic reagents which cause harmful side effects such as kidney failure, cardiopulmonary failure, etc. Cryoprotectant toxicity, according to the ongoing research work, could be due to denaturation of the proteins in the body. Understanding the cryoprotectants at a molecular level is very important to find out the reason for its toxicity. Mending it would be a big step in the research field of cryogeny. Their toxicity can be reduced at low temperatures and can even become negligible if the temperature is low enough, but unfortunately, the viscosity of the agent is extremely low at these temperatures and thus cannot diffuse into tissues which render it ineffective.

Cryoprotectants are chemicals which prevent cells, tissues or organs from the damages caused by freezing. Its main purpose is to make a dehydrating atmosphere for the preservation of the body. The vital problem associated with this process is cryoinjuries and these commonly occur during

post-thawing and pre-freezing. Generally, cryopreservation is done in isobaric conditions. Despite that, it has some disadvantages. To overcome these problems, isochoric conditions are preferred. Carrier solution (maintains stability within cells) and ice blockers (prevents ice formation) are two major components used in vitrification. Recently, methods have been developed for freezing organs which proves to be better than vitrification.

Benjamin P Best explains in detail the biological aspects of cryopreservation. Ischemia is one of the problems faced in cryopreservation. It is the deterioration of blood vessels and the tissues of the body due to lack of the necessary blood flow. Such damage can cause oedema in blood vessels and various other effects which are detrimental to the cryonics patient. If reperfusion is done within a few minutes of the cardiac arrest of the patient, his body tissues and blood vessels can recover due to the re-establishment of gases and nutrient exchange. But a delayed reperfusion can cause more harm to the body tissues and blood vessels than what would have been caused if there was no restoration at all. A lot of the damage causing oxidants are produced during the ischemic period, and thus this period should be reduced to a minimum. Neurons do not die immediately after the beginning of ischemia but do die out during reperfusion prior to a while of ischemia. Introduction of calcium into neurons can help prevent neuron death. Hypothermia is used to reduce the damage of ischemia to a very large extent, but also has various side effects like cold shock, chilling injury, etc.

Daniel R Spector highlights the factors that hinder the possibility of future revival of a cryonics patient. He mentions that the freezing techniques of the present are not perfect. They do cause deterioration of the body of the dead patient. He also emphasises on the fact that such a revival is based on the assumption that future biomedical advancements can not only cure the cause of death of the individual but can also amend the damage caused to the individual due to freezing. Death is defined legally by the biological standard used by doctors. It is considered to be something natural and ineluctable, but cryonics may change the definition of death to being a disease which can be cured. Now the word 'death' should be re-interpreted legally in such a way that it is no longer considered absolute and also those who are frozen are put in a category different from those who are dead. If in a very far future, cryonic patients are revived, it can be said that they no longer possess their former identity and this would create a lot of legal complications as they would have a new legal record and would not be penalized for anything they have done in their 'past life' which would be unfair.

To evaluate patient's priority either before suspension or after suspension, a cryonicist should definitely consider biomedical ethics which were established by Childress and Beauchamp. The biomedical ethics for cryonics include respect for autonomy, beneficence, justice and non-maleficence. Considering all these principles, cryonicists need to face the sturdy and actual responsibility to ensure the cryopreservation of patient. Ethics of cryonics includes justice, meaning everyone has the right to undergo cryopreservation but the enormous amount of money for the process makes it possible only for the big shots. This money can be utilised in many more resourceful ways like saving the lives of those living in the present. Nonetheless, a question about who has the right to live arises. Some may choose the person who can benefit the future better. Others may choose the wealthiest and most popular persons. The people resuscitated in the future would face problems with their identity, adjusting in a society with different social norms and customs. This will affect them physically and psychologically.

Nature is something beyond human understanding. But the intellectual human race always strives to prove impossible deeds of nature into possible. Such desires of humankind lead to major

accomplishments in the world of science. People are not interested in theoretical science. They are interested in desires that motivate research. The man started his war against time so that he can destroy all the boundaries created by nature. This lead to the proposal of cryonics. Cryonic freezing is considered to be an alternative to death. People consider cryonics as a great accomplishment because of the hope that they would be able to see a better world sometime in the future.

Findings

Cryonics is a developing idea that may or may not work out as expected in the future. The idea emerged from the concept of hibernation and diapauses of the living organisms. It started with the preservation of organs for transplantation and now it has gone to an extent of preserving humans for future revival. Cryopreservation is a process which uses chemicals like glycerol to preserve the body, but these do have their own disadvantages. The process can ensure the prevention of ice formation and continuation of the body circulation but have a lot of side effects such as injuries due to cryoprotectant toxicity. Current medical progress does not have a way to reverse the state of the cryopreserved body and thus we are completely dependent on the possibilities of the future. Under the current rate of progress in the field of nanotechnology, it is predicted that in future, it would be able to cure the damages caused by the disease and also find the antidote for the disease which is considered incurable till date. The procedure is also very expensive and cannot be accessed by those who are underprivileged. It opens up a new field of study with a lot of career opportunities in the research field for all the young and enthusiastic minds.

Recommendations & Conclusion

Dying is something no one would wish for, the solution for this could be cryonics. The success of cryonics would bring about a great revolution in the field of medical science. It has many applications such as space research, the solution to natural disasters. But every coin has a flip side and so does cryonics. Cryonics slows down the cell metabolism but this does not necessarily mean that the ageing of the cell is slowed down or stopped.

This can mean that the suspendee might continue to age even while being cryonically preserved. Also, in this process, we are defying a natural process called "Death" which marks the end of one's life. This way, if the procedure turns out to be successful, there would be a hike in the world's population which would be economically and environmentally hazardous.

The procedure of cryonics just gives a person hope and not an assurance of life extension. Thus, if you want to undergo this procedure, it will definitely be useful in the field of research but may or may not be fruitful for you.

References

Best, B. (2008). Cryoprotectant toxicity.

Best, B. P. (2012). Vascular and neuronal ischemic damage in cryonics patients. Rejuvenation research, 15(2), 165-169.

Bhattacharya, M. S. (2016). A review on cryoprotectant and its modern implication in cryonics. Asian Journal of Pharmaceutics (AJP): Free full-text articles from Asian J Pharm, 10(3).

Cron, R. (2014). 'Is Cryonics an Ethical Means of Life Extension?

Darwin, M. (2007). History of DMSO and glycerol in cryonics. Cryonics 3rd Quarter.

Ettinger, R. C., & Rostand, J. (1965). The prospect of immortality. Sidgwick and Jackson.

Hughes, J. (2001). The future of death: cryonics and the telos of liberal individualism.

Karthikeyan J., Christopher Rajasekaran W., Unyapho P. (2019) Analysis of Diverse Open Source Digital Tools and Learning Management System Users in Academics. In: Satapathy S., Bhateja V., Somanah R., Yang XS., Senkerik R. (eds) Information Systems Design and Intelligent Applications. Advances in Intelligent Systems and Computing, vol 862. Springer, Singapore

LaBouff, J. P. (1992). He Wants To Do What-Cryonics: Issues in Questionable Medicine and Self-Determination. Santa Clara Computer & High Tech. LJ, 8, 469.

Spector, D. R. (1969). Legal Implications of Cryonics. Clev.-Marshall L. Rev., 18, 341.

Yorke, C., & Rowe, L. (2006). Malchronia: Cryonics and bionics as primitive weapons in the war on time. Journal of Evolution and Technology, 15, 74.

ARTIFICIAL INTELLIGENCE A SUPER POWER

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What is artificial Intelligence

[1] Artificial intelligence is the making of computer programs and intelligent machines from science and technology which are faster than human. It is a program which if made to work and analyse on human intelligence.[2] Artificial intelligence is a software which mostly runs with minimum usage of human interruption because the program is completely designed by humans to work without any disturbance and no one can stop it in between. It has first started with invention of robots. It is also called machine intelligence. Artificial Intelligence requires human intelligence.[3] Artificial Intelligence is a branch of computer science in which analysis a huge bunch of complex medical data. Artificial intelligence has a potential through which we can exploit the connection within a data set which can be further used in diagnosis, treatment and can be used in predicting output in many clinical scenarios. Many Medline and internet searches were carried out using the keyword 'Artificial Intelligence' and 'Neural Networks (computer)'.[4] Artificial Intelligence is the process of making machines intelligent and intelligence is the quality that enables a process to function properly which is compatible with the environment. According to the lines mentioned above-lot of things like human, animals and some of the machines are intelligent. Machines such as smart camera's.[5]Artificial Intelligence is the study of ideas which allow computers to do work that make human seem to be intelligent. The ultimate goal of Artificial Intelligence is to make computer system more usable(useful) and to understand the main role and principle of intelligence which make it possible.

History of Artificial intelligence

[6] The history of artificial intelligence involves fiction, ideology, philosophy and imagination of the inventors. The inventions which were made early like electronics, technology and many discipline have given idea for artificial intelligence . The early achievements which includes working on problem solving which includes basic work understanding knowledge representation, demonstration of programs in understanding the language, proving theorems.

[7] Artificial intelligence first came up in 1950. There were a lot of limitations in models which were made early that prevented a widespread acceptance. Many of the limitations were accepted because of the intense learning in the early 2000's.[8] History of artificial intelligence is therefore is not only the history of mechanical attempts to replace the static notion of human intelligence but there is a changing account on which we think about the intelligence itself. Artificial Intelligence was not born at Dartmouth in 1955 because the standard account would have made us believe but this participates in much longer histories of what we take into account as intelligence and which counts as artificial. For example is Phil Husbands, Owen Holland and Michael Wheeler's "The Mechanical Mind in History (2008) situate symbolic processing of information at the end of a long history of mechanical theories of mind.[9] The research on Artificial intelligence start after WWII, when many number of people started working independently on intelligent machines. Among them the first was the English mathematician Alan Turing. He gave a lecture on Artificial intelligence in

1947. He was also the first to tell that Artificial Intelligence is the best researched program rather than investing time on building computers. By late 1950s there were so man researches who thought Artificial intelligence is an good investment and most of them were basing their work on computer programming.[10] Artificial Intelligence is not the first use of computer systems in medicine. The Artificial Intelligence in the field of medicine emerged in the year 1970 in response to continuous needs ,opportunities and interests. There was a sudden demand for high-quality medical services with explosive growth of medical knowledge has led to the demand that computer programs can be used to assist physicians and other health workers for their clinical roles in therapy and diagnosis.

Growth of Artificial Intelligence

[11] During the 19th century one evening William Paley made an assumption and argued that there is a need for intelligent designer for the production of complex systems. At 1859 Charles Darwin refused Paley's idea. Charles Darwin showed Paley how complex systems can produce random variations from a process of selection which can arise naturally. Darwin showed that complex systems can be created without using intelligent designer. All the interesting features of biology and intelligence have been improved through Darwin's process.[12] Artificial Intelligence is there for over six decades. In recent years Artificial Intelligence has been empowered by super computing power and big data rapid increase. Artificial Intelligence has become an important and attractive topic for research. The new generation of Artificial Intelligence is rapidly expanding.[13] The term Artificial intelligence was first pointed out by Mc Carthy in the year 1956 during a conference meet which was held on the subject Artificial Intelligence. Alan Turing was the one who first pointed out that machines can also follow the human behaviour, he created an Turing test to differentiate between computer machines and humans. From this point there came up something called computational power has grown up to instant calculations and the ability to evaluate new data according to previous accessed data in real time. Artificial Intelligence is involved in our daily lives in so many forms such as Siri, Alexa, Google assistant and many more. Inmost recent process Artificial Intelligence has also been included in the medical field to improve the quality of taking care of patient by speeding up the process and reaching an higher accuracy and enlightening the path in healthcare overall. Machine learning is evaluating medical record of patients, pathology slides and radiology images. By this way there would be no mismatch of data.

Artificial Intelligence in Healthcare Appliances

[14] Artificial Intelligence is slowly changing medical practice. It is expanding into fields which was early thought by human province. It has recently progressed in data acquisition, computing in infrastructure and machine learning. The technologies in artificial intelligence and their biomedical applications are identifying the challenges for the progress in future. It's also summarising the economic and social implications.[15] Artificial Intelligence is aiming to imitate human functions and capabilities. It's bringing a shift for healthcare by increasing its availability of data related to healthcare and there is a huge progress seen in analytics. This can be applied to various types of healthcare data both structured and unstructured. The Artificial Intelligence which are popular including machine learning method for all types of structured data that is for neural networks and unstructured data for natural language processing. The major diseases which are covered by artificial intelligence are neurology, cardiology and cancer.[16] Artificial Intelligence has a huge amount of potential to improve the safety measures for healthcare. Artificial Intelligence is increasing its diagnostic accuracy , showing their outcomes of care and increasing their diagnostic accuracy.

The Artificial Intelligence technologies are being upgrading to new risks and correcting the existing ones. [17] Artificial Intelligence techniques have a huge potential that it can be applied in every field of medicine. The most common analytical tool which emerged from Artificial Intelligence was Artificial neural network. The other tools like fuzzy expert systems, evolutionary computation and hybrid intelligent systems are used in different clinical settings.

Artificial Intelligence in Manufacturing and Production

[18] Artificial Intelligence have given smart manufacturing benefits that monitors analyses and makes an proper and better decision compare to human being. Smart manufacturing techniques has industrial connectivity devices and services, big data processing abilities and robotic software. This changes the way that the product are manufactured and packed. It has also given us sensor technology and improvement in computer methods. [19] Artificial Intelligence has given us a huge amount of core technologies in the new period of internet plus Artificial Intelligence which is creating great changes in ecosystems, models and in the development of Artificial Intelligence. [20] The smart systems and Artificial Intelligence are playing an ever increasing and major role in daily lives of human and countries growth. The production of Artificial Intelligence applications are continuously increasing day by day in manufacturing and production field.[21]The manufacturing systems which are present today are increasing their complexity day-by-day and they are all are interconnected among themselves. The operations which are carried out in the factories are facing challenges of highly non linear due to many number of uncertainties and inter-dependencies that are present. The recent development in the field of Artificial Intelligence especially in the specialisation of Machine learning have shown transformation in the manufacturing sector through many of the advanced analytical tools for processing the huge amount of data generated also called as big data.

Artificial Intelligence in Security and Surveillance

[22] Artificial Intelligence has its most importance and use in fighting against crime and strengthen our national security. Artificial Intelligence is mainly used for making decision rapidly and piling up the huge amount of data , only Artificial Intelligence can lead to success in these types of needs. Artificial Intelligence also helps in forensics , varied decision drafting and creating plans. It analysis problems in short period of time in which an human can do and increases the chances of getting output. [23] Artificial Intelligence has direct contribution in national security in so many countries. There are so many countries using their own strong programs in Artificial Intelligence with full protection. Kevin Kelly has notes that start-ups in normal business and Artificial Intelligence are completely different. There is no comparison between application of Artificial Intelligence in Information Technology sectors, economic tools ,financial tools to that of security of an country.[24] The application of Artificial Intelligence in camera surveillance has been adopted by various industries for smart manufacturing. Artificial Intelligence is so much helpful to process and store large amount of video recordings. There are also various vision algorithms to detect abnormal behaviour thus reducing the human power. All these require a lot of computational resource.[25] Artificial Intelligence serves as a very big advantage and it is used widely in the field of cyber security as told by many leaders. It increased automation and reduced labour than the traditional human surveillance method. The more use of machine learning can accelerate this and adding sophisticated cyber capabilities. It is also used to invent new things in the cyber security and it can attack vectors.The role of Artificial Intelligence in the field of Information security can reduce the leakage of confidential information. Artificial Intelligence can provide them new type of security.

Artificial Intelligence in Education

[26] Artificial intelligence in education includes many things like personalized instructional and dialogue system from basics through Artificial Intelligence supported learning, helps in analysing the student writing, intelligent minds in the game based environment, there is chatbots for student support, Artificial Intelligence facilitated instructors compatible with students that put them firmly in control of their own learning. These include student interacting one to one with computer systems and school approaches. The field of Artificial Intelligence is innovative and derivative in education system. It also brings new theories and methods from fields such as cognitive science. These puts a light on learning, exploring new opportunities and gives a new way of teaching.[27] There has been a rapid increment of application of Artificial Intelligence in the education system. Artificial Intelligence is going over and the conventional understanding of it as a super computer has to include embedded computer system. The creation of robots and which are embedded with Artificial Intelligence has improved the quality of learning for the students from the most basics of education. These robots are used to teach students like pronunciation, spelling an which include some of the basic tasks. There is a shift from just downloading materials from online and studying that to students have been adapted to web-based learning that is learn instructor and learner behaviour to adjust accordingly, to enrich the quality of learning. The application of Artificial Intelligence systems and algorithms is being increasing in education field. It can also identify place of the course which needs improvement.[28] From the past 25 years, the Artificial Intelligence in education system has been focusing largely only on solving two sigma problem by creating systems that are useful for one-on-one tutoring. All these years Artificial Intelligence has improved themselves and gradually taking steps towards their goal. The computer software's have improved a lot in helping students gaining knowledge and exploring things on internet. The introduction of 21st century skills and the new science standards have been on spotlight and showed us the importance of general learning skills, collaborating and critical thinking. Artificial Intelligence can automate basic activities in education. The field of Artificial Intelligence has to make certain changes like to maintain the relevance and increase its impact in incorporating practises using huge problems in collaborative settings. These transitions in education are also an opportunity. Artificial Intelligence helps both students and teachers interact more comfortably with each other and with other AI present in the world. Both students and teachers are in need of better learning environment and personalized support. Artificial intelligence can help teachers in the grading process and from here time can be saved which can be utilised in some other work.

Advantage of Artificial Intelligence

[29] Artificial Intelligence supplies a good amount of advantage to the human beings like to stimulate human intelligence for solving problem and making decision. It also provides the advantage of permanency, reliability and cost effectiveness. It takes less time to solve a problem or reach to a decision. Artificial Intelligence is applied in so many places like in the field of engineering, modelling, manufacturing, linguistics, controlling applications and economics. The most promising use of Artificial Intelligence is that it is used as search engine in Internet. Artificial intelligence can make faster decision by automating the process of decision making process. Artificial Intelligence can produce solutions to complex problemsthrough gathering data, screening ,processing. Artificial Intelligence are well capable of both qualitative and quantitative data, these methods are missing in analytical method.[30] Using Artificial Intelligence can reduce human works that is replacing human being by machines and human beings can be engaged in other works. It is

used in programming, self-writing and self-modifying etc all these works can be a burden to human beings. Artificial Intelligence is like a cheap labour and by using this our works will get over soon and we can earn more profits in a short period of time. This can be deployed in industries and companies easily. Machines does not require short time breaks and lunch breaks like human beings and the money spent for these works can be saved. Machines work for a long period of time and they do not get bored. Artificial Intelligence can be used in mining and other fuel activities because there is an danger for human life. "Human beings can make new robots but robots cannot make new human beings".[31] Artificial Intelligence can take up stressful and complex work that humas may struggle to do and cannot do. It can complete tasks faster than humans. It helps us to discover unexplored things like outer space. It does work with less errors and defects. Artificial Intelligence function is infinite. Computers provide us the perfect communication medium for experimentation in the present era. Artificial Intelligence is more successful at intellectual tasks like computer based gaming and proving theorem which are difficult for human beings. [32] One of the major advantage of Artificial Intelligence is that decisions are totally based on facts instead of emotions. Even after a lot of efforts human decision are always taken out of emotion or their mindset while doing their job which is negatively affected in our work this is an well known fact. It helps in easier spreading of facts and knowledge. Once a computer(artificial knowledge) is trained for something it can be so easily copied to other computers which reduces time instead of wasting time by spreading knowledge or teaching any other human through training. [33] Artificial intelligence has a very high success ratio because the program is already made and fed into the computer after lot of corrections while human beings can make mistakes. It occupies less space and less size. A lot of functions or programs can be done at a time. It produces less errors in a task and defects. A more complex work is done in a short period of time.[34] Artificial Intelligence works so well when large amount of high quantity data and when it comes to application it is resilient to potential errors because the consequences of failure is minimal. If the work is done by humans we need to double check the work but when done by machines we don't need to double check it.

Disadvantages or Challenges in Artificial Intelligence
[35] Due to high cost of equipment it is difficult to develop the machines. It takes a lot time to rebuild, repair and create. The repair can cost extra cash, resource and humans to fix it. The machines replacing humans increases unemployment rate and humans have to go in search of jobs and fix it. Artificial Intelligence cannot suddenly change government to communism. Machines can very easily cause destruction if it goes to unsafe hands. Artificial Intelligence is making humans lazy with automating bulk of works to machines. Humans are totally hooked up because of these inventions which can cause a drag to future generation. Artificial Intelligence is majorly replacing the repetitive tasks and works to robots, human interference is becoming very less that causes a significant problems within the utilising standards.[36] The main disadvantage of Artificial Intelligence in our day to day activities are: Sometimes this can lead to mass scale destruction due to misusing software. Programs mismatch takes place sometime due to opposite command given in the program. Human jobs gets into danger. The overall creativity of the programmer depends on the human mind. Unemployment rate goes high. This lacks the human touch. Technology dependenceincreases due to which human beings become lazy. Artificial Intelligence requires a lot of investment of time and money at the beginning.[37] Artificial Intelligence is unable to explain the logics and reasons behind a certain decision. The situation of current development is at a stage where the Artificial Intelligence cannot know when there is non-availability of solution to a particular problem. Machines cannot replace the connection made by humans that is machines cannot develop bonds like huma beings which is an important aspect when it comes to team management. Machines are designed only to the specific programs for which they are designed they

cannot do anything out of the box if a sudden change is required.[38] The disadvantage of Artificial Intelligence is that it creates a lot of unemployment and this can lead to a lot of struggle to people, people cannot educate their children this leads to sudden stop in economic growth. There would be lack of human touch as well as emotional touch when all the works are done by machines.[39] Artificial Intelligence is not able to co-operate with the ethics. Morality is not present in a machine and it is very difficult to design. Even after we do all this it is very big task through convey with technology. Artificial Intelligence can help us cut down time but it is totally meaning less expecting machines to follow ethics and values as it is like drawing sketches on water. All this is an human trait.

Conclusion

Artificial Intelligence is something which will be used a lot and it can do wonders in our upcoming years. Artificial Intelligence is transforming is transforming almost everything which is connected to humans like employment, security, communication, healthcare and privacy. It is one side of life where it gives us a lot of surprises,increases our excitement level to learn new things and we start exploring many websites or we just surf in internet. Artificial Intelligence will be more in demand because the amount of data and information generated these days are high in number which cannot be absorbed by humans or stored somewhere. Artificial Intelligence helps us solve complex problem like permutation and combination. Artificial Intelligence will be major contribution to economic growth in future. Artificial Intelligence is also helping us in the field of medicine which can save lot of people. Artificial Intelligence is going to create more competitive world. Due to Artificial Intelligence there will be a lot of unemployment in future so people must start securing their job or increase their knowledge in the field in which they are working. People can also start gaining knowledge in which their subject or their study is related. Artificial Intelligence is going to create hike in each and every field. People who have invested in stock market must be more careful because they are the one who are in more danger and in the same way they are the who can also gain more. Artificial intelligence has more number of advantages compare to disadvantages, So all the disadvantages can be ignored.

References

Arinez, J. F., Chang, Q., Gao, R. X., Xu, C., & Zhang, J. (2020). Artificial intelligence in advanced manufacturing: Current status and future outlook. *Journal of Manufacturing Science and Engineering*, *142*(11), 110804.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intelligence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intelligence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Burggräf, P., Wagner, J., & Koke, B. (2018, January). Artificial intelligence in production management: A review of the current state of affairs and research trends in academia. In 2018 international conference on information management and processing (ICIMP) (pp. 82-88). IEEE.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Crandall, D. J. (2019). Artificial intelligence and manufacturing. *Smart Factories: Issues of Information Governance*, 10-16.

Dick, S. (2019). Artificial intelligence.

Duan, Y., Edwards, J. S., & Dwivedi, Y. K. (2019). Artificial intelligence for decision making in the era of Big Data–evolution, challenges and research agenda. International Journal of Information Management, 48, 63-71.

Etzioni, A., & Etzioni, O. (2017). Incorporating ethics into artificial intelligence. *The Journal of Ethics*, *21*(4), 403-418.

Hamet .P., & Tremblay, J. (2017). Artificial intelligence in medicine. *Metabolism*, *69*, S36-S40

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education. *Boston: Center for Curriculum Redesign*.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., & Scharre, P. (2018). *Artificial intelligence and international security*. Center for a New American Security..

Jiang, F., Jiang, Y., Zhi, H., Dong, Y., Li, H., Ma, S., ... & Wang, Y. (2017). Artificial intelligence in healthcare: past, present and future. Stroke and vascular neurology, 2(4).

Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine. *Gastrointestinal endoscopy*, *92*(4), 807-812.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. Frontiers of Information Technology & Electronic Engineering, 18(1), 86-96

Macrae, C. (2019). Governing the safety of artificial intelligence in healthcare. *BMJ quality & safety*, *28*(6), 495-498.

McCarthy, J. (1998). What is artificial intelligence?

McCarthy, J. (2007). What is artificial intelligence?.

Minsky, M. (1961). Steps toward artificial intelligence. *Proceedings of the IRE*, *49*(1), 8-30.

Mintz, Y., & Brodie, R. (2019). Introduction to artificial intelligence in medicine. *Minimally Invasive Therapy & Allied Technologies*, *28*(2), 73-81

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In *Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi*.

Mohammadi, V., & Minaei, S. (2019). Artificial intelligence in the production process. In Engineering tools in the beverage industry (pp. 27-63). Woodhead Publishing.

Nguyen, M. T., Truong, L. H., Tran, T. T., & Chien, C. F. (2020). Artificial intelligence based data processing algorithm for video surveillance to empower industry 3.5. Computers & Industrial Engineering, 148, 106671

Radulov, N. (2019). Artificial intelligence and security. Security 4.0. Security & Future, 3(1), 3-5.

Ramesh, A. N., Kambhampati, C., Monson, J. R., & Drew, P. J. (2004). Artificial intelligence in medicine. *Annals of the Royal College of Surgeons of England*, *86*(5), 334.

Ramesh, A. N., Kambhampati, C., Monson, J. R., & Drew, P. J. (2004). Artificial intelligence in medicine. *Annals of the Royal College of Surgeons of England*, *86*(5), 334.

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education*, *26*(2), 582-599.

Spector, L. (2006). Evolution of artificial intelligence. *Artificial Intelligence*, *170*(18), 1251-1253

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*

Szolovits, P. (Ed.). (2019). *Artificial intelligence in medicine*. Routledge.

Szolovits, P. (Ed.). (2019). *Artificial intelligence in medicine*. Routledge..

Teng, X. (2019, April). Discussion about artificial intelligence's advantages and disadvantages compete with natural intelligence. In *Journal of Physics: Conference Series* (Vol. 1187, No. 3, p. 032083). IOP Publishing.

Yampolskiy, R. V. (Ed.). (2018). Artificial intelligence safety and security. CRC Press.

Yu, K. H., Beam, A. L., & Kohane, I. S. (2018). Artificial intelligence in healthcare. Nature biomedical engineering, 2(10), 719-731

GAMIFICATION OF EDUCATION

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Abstract
With the gaming industry rapidly climbing to its epitome by rapidly integrating new and relevant technologies, the attention of most of the youths have been tapped into for the past half of a century. These programs have been able to do easily what the teachers struggle through during their class with the same set of student. Through gamification we intend to use the applications of game mechanics to bridge the attention gap between the students and to use the skillsets of teachers. Some benefits includes real-time score updates, leaderboards, etc. which keep up healthy competitions. Other major benefits include early detection of diseases which cause learning disability and adaptability to suit their learning needs.
Keywords: *gamification, education, gamification in education, integration of technology, learning*

Introduction

In today's fast paced world, the uses of books are growing obsolete due to the takeover of technology. This trend has rendered the conventional ways of learning ineffective to a large extent. The current systems of education that we follow across the world have not been able to keep up with the pace of our constantly evolving lifestyle which is heavily influenced by technology. In our present system of education everyone is taught in the same manner and assessed by the same standards. We often ignore the fact that each student is unique and learns differently. Through gamification we can analyze what form of teaching would be effective for each student and provide an interface between the teacher and the student that is convenient for both. Around 0.7% of the worlds population suffer from autism, 20% from some extent of dyslexia and 0.1% from downs syndrome. These are some of the most common learning disabilities that occur in children. Gamification of education can help to diagnose such diseases and adapt itself to suit the students learning need.

Literary Survey

[1] Gamification is applying game components outside gaming settings, Game playing is related with preliminary, mistake, disappointment and possible accomplishment through training, knowledge, reflection and learning. By applying gamification to the classroom, students could be propelled to learn in new ways or appreciate generally monotonous assignments. A definitive objective when gamifying is to increment characteristic inspiration. The three sorts of natural inspiration incorporate inherent inspiration to know, characteristic inspiration towards achievement, and inborn inspiration to encounter simulation. To make a gamification framework that builds understudy inspiration, it is important to center on central components that make videogames speaking to their players.[2]At the point when Students are required to think fundamentally to solve problems, game like simulations can be utilized in any train to fortify this present real world uses of

ideas. the utilization of gamification must be finished with a profound comprehension of gaming mechanics and an unmistakable handle of gamer inspiration. Four fundamental classes of gamers:

Socializers are regularly more intrigued by having relations with alternate players than playing the diversion itself. They are frequently associated with the network part of the amusement.

Achievers are focused and appreciate beating troublesome difficulties whether they are set by the diversion or without anyone else's input.

Executioners get a kick out of the chance to force them over different players in the degree given by the virtual world.

Pioneers get a kick out of the chance to investigate the world – its geology as well as the better subtle elements of the diversion mechanics. These players may wind up knowing how the gaming functions and carry on superior to the game developers themselves.

[3]The immediate nature of student/player input or feedback is a standout amongst the most convincing contentions for the gamification of education. In a game setting feedback is quite often quick, directed and intended to empower to player to adjust their approach for better, more alluring outcomes. Generally a videogame is full of feeling on the off chance that it can keep up an emotional criticism circle; if the player turns out to be deliberately mindful of how that input circle is controlled by their physiology thus ready to intentionally control their responses, the full of feeling nature of the criticism circle is lost and it turns into a type of biofeedback. As instructors keep on exploring better and more powerful approaches to connect with a more extensive gathering of people of students in a more extensive setting of situations, the appropriation of gamification techniques will keep on offering snappier and more compelling catalyzing apparatuses than conventional sage in front of an audience guideline.[4]The intensity of computer games lives not simply in their present instantiations, but rather in the guarantees the advances by which they are made to hold for the future.

Game makers can influence universes where individuals to can have important new encounters, encounters that their places in life could never enable them to have. These encounters can possibly make individuals more quick witted and more astute.

Different styles of learning work better for various individuals. Individuals can't be operators of their own learning in the event that they can't settle on choices about how their learning will function. In the meantime, they ought to have the capacity to attempt new styles. Good games accomplish this objective in one of two different ways. In a some games, players can redo the game play to accommodate their learning and playing styles. In others, the game is intended to permit distinctive styles of learning and playing to work. Intellectual research recommends that for people perception and action are profoundly interconnected. [5]Great amusements offer the player multifaceted, powerful, and simple control of the world's articles, objects which progress toward becoming apparatuses for completing the player's objectives. Good games alter difficulties and give feedback so that distinctive players feel the amusement is testing yet possible and that their exertion is satisfying. Good games make and bolster the cycle of aptitude, with cycles of broadened rehearse, trial of dominance of that training, at that point another test, and afterward new expanded practice. People don't care for honing abilities outside of any relevant connection to the issue at hand again and again, since they find such expertise hone futile in good games, players learn and hone ability bundles as an integral part of achieving things they need and need to accomplish. People learn aptitudes, methodologies, and thoughts best when they perceive how they fit into a general bigger framework to which they give meaning. Great recreations enable players to see and see how every one of the components in the game fit into the general arrangement of the game and its type.[6]Needed to gain ground in the field of geological information among people. Created an

amusement called "MAPPIT". Believes recreations will have no place in instruction foundations if the learning had been more fruitful. In this advanced period of innovation youngsters grows up by utilizing web and computers. All the things that they require are at their fingertip. One of the fundamental targets is to make the kids to have a decent association with others and additionally to give them the knowledge in an entertaining way. The amusement incorporates games, movies, music and so forth. Utilizing them in learning will assist the youngsters with learning everything so effectively and these ought to likewise incorporate the essential factors that fabricate the base. Current amusements are utilizing man-made brainpower frameworks which help the person who is utilizing it to settle on choices and to confront the results. Used three diversions alongside education to figure out the impact of recreations in education. Discovered that the youngsters were energetic and didn't discover any exercise as a dreadful one.[7]Gamificationis based on the principle that people respond to computer as they were persons. Gamification, at its core, means to apply game mechanics to mundane activities to increase engagement and knowledge retentivity. Gaification, being a proven technology, is already in use by any websites to increase loyalty and effective market engagement. The strategy of gamification is to combine both intrinsic and extrinsic motivators to help engage the student for longer periods of time and to make mundane topics more interesting.[8]Case study conducted on the basis of gamification. Study was conducted regarding a game called SuLi (Sustainable Living). The main aim of this study was to create awareness about sustainable living and to try and integrate the concept of gamification into secondary education. The students received it well and were very well responsive to the concepts which the developers were trying to get through to them. This case study proved the effectiveness of gamification though with a few disadvantages which can be ironed out in the following years to come. This proves the effectiveness of gamification and the fact that it could be a integral part of the learning process in the years to come. The growing interest in gamification due to its application in other fields has led to an increased in the field of education to engage students in the learning process and to increases knowledge retention. This paper consists of mapping many papers to form a literary survey on the topic of gamification on education. Going through them we get an idea on how effective gamification can be as it is supported with statistical data as well.[9]Video games are just programmes which engage users to problem solve under already determined set of rules. This loop of continuous feedback and interaction has a great potential to be used in education. Such a system can be designed keeping the needs of the students in mind thus helping the student to complete activities which might be considered repetitive or mundane. Gamified systems can keep the student engaged for longer periods of time compared to book which interests only a select few of the student population. Due to the feedback loop, gamified systems can detect behavioural changes which can help in many ways. One of them being alerting the teachers if the student is depressed. Another use being able to detect the early symptoms of learning impairing disease.[10]Despite the popular belief that video games can be mind numbing and a habit of the lazy it is found out that video games increases various cognitive abilities or skills. Game developers have become proficient in engaging people of all ages successfully into the world of virtual world of video games. Gaming surroundings actually inculcate regular expressions of optimism and inspiration. This helps in the sphere of education where all these values are essential.

Findings

Gamification, being a very practical and proven method is slowly taking effect. Our findings through this study are that gamification is the best available option for the rampant problem of attention deficiency which is rampant in our generation. We have come to know that gamification stimulates multiple regions of the brain helping to increase focus and engagement in the subject. Is can be easily integrated to education without making heavy changes in the infrastructure. As most

educational institutes are already equipped with the hardware all that is required is to create the softwares for the implementation of gamification. Moreover the expertise of the teachers can also be utilised for the development and management of a gamified system of education. The greatest advantage being that gamification of education grants people with learning disabilities access to education in an easy manner which was not so upto these years. It an also help diagnose such diseases in an early stage.

Conclusion

Education is the most basic right and requirement. It lays the foundation for our future and hence it is important to better our system of education and make it apt for the fast paced and tech savvy lifestyle. Gamification of education is not only the need for the present but also helps to increase student participation, interaction and motivation thereby making tedious tasks more enjoyable and involving. After thorough examination of research papers on our topic, we have concluded that gamification is a very novel and unique approach to the most rampant problems faced by the student of our generation. We hope that through this paper the doubts on the minds of sceptics will be erased on this topic so that this form of technology can be implemented as soon as possible so that it can impact a lot of students and improve the overall quality of education which in turn improves the quality of humanity.

References

Arnold B. J. (2014). Gamification in education. *Proceedings of the American Society of Business and Behavioral Sciences,21*(1), 32-39.

de Sousa Borges, S., Durelli, V. H., Reis, H. M., &Isotani, S. (2014, March). A systematic mapping on gamification applied to education. In Proceedings of the 29th Annual ACM Symposium on Applied Computing (pp. 216-222). ACM.

Gee, J. P. (2005). Learning by Design: Good video games as learning machines. *E-Learning and Digital Media, 2*(1), 5-16.

Granic, Isabela, Adam Lobel, and Rutger CME Engels. "The benefits of playing video games." *American psychologist* 69.1 (2014): 66.

Muntean, C. I. (2011, October). Raising engagement in e-learning through gamification. In Proc. 6th International Conference on Virtual Learning ICVL (Vol. 1). sn.

Obrazovanju, I. U. O. I. Gamification In Education.

Pohl, M., Rester, M., &Judmaier, P. (2009, July). Interactive game based learning: advantages and disadvantages. In International Conference on Universal Access in Human-Computer Interaction (pp. 92-101). Springer, Berlin, Heidelberg.

Sandusky, S. (2015). Gamification in education.

Tavakkoli, A., Loffredo, D., & Ward Sr, M. (2014). Lessons from Game Studies to Enhance Gamification in Education. In proceedings of the 18th World Multi-conference on Systemics, Cybernetics, and Informatics, Orlando, FL.

Van de Pavoordt, Pim. "Gamification of education".

ARTIFICIAL INTELLIGENCE: THE INESCAPABLE

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What is Artificial Intelligence?

[1] It can be outlined as the analysis of mental and psychological abilities by using various computational patterns and sequences. The term "intelligence" in this field can be very deceptive. For instance, we usually apply this word when we want to describe someone displaying unusual inventiveness and mind-blowing skills. This results in giving the impression that artificial intelligence is a reliable method for generating loads of clever ideas and insights but in reality, AI revolves around the basic idea of duplicating the physiological and mental abilities of the "ordinary" people. [2] Artificial Intelligence can also be defined as the science of creating sophisticated machines and devices as well as various computerised programmes to analyse human intelligence. It doesn't routinely restrict itself to systems of biological significance. Human intelligence does not necessarily have to be about manipulating human intelligence. Its more about using what we know to publicly create something that would help solve the practical problems that the world presents us with. Although the ultimate aim of artificial intelligence is to create devices that have human-level intelligence, some might think that this practice isimmoral and indecent.

History of AI

[3] The initial stages of artificial intelligence are connected to philosophy, creative imagination and fiction. The invention made in the early ages related to various fields of engineering have influenced the creation of AI. Many philosophers have circulated the idea that the meaning of what it is to be human can be evaluated by using intelligent machines. In various science fiction stories, writers have used the concept of advancing technologies to develop fantasies of their own that allows us to think about our own human character. Artificially created characters like robots, mechanical dolls and animals, Mary Shelly's Frankenstein and many other artificially made things have always grabbed the public's attention. In the seventeenth century, these dolls were actually based on the clockwork mechanisms. In the twentieth century, the crowd saw the several inventions in the electronics field and modern computers were recognised post World War-II. In the 1940s these computers were known as the "giant brains" owing to the fact that they had a brilliant calculating power. In the 1950s, Allen Newell, Herb Simon and J. Clifford Shaw wrote programs that were quite ahead of their time and were able to give proof for various logic theorems. Knowledge-based systems came into view around the 1960s and 1970s. The explanation of the logical proof of the Dendral program was presented by Ira Goldstein and Seymour Papert and was said to be a "paradigm shift" in the field of knowledge-based systems. 'Computers and Thoughts' was the first book that had all the collected information about working AI programmes and was written by Edward Feigenbaum and Julian Feldman in 1963.[4] Around 1490, Leonardo da Vinci had mapped and designed a humanlike robot which had been in the form of a medieval knight. This form was able to do the basic movements like moving its jaw, arms and head as well sit up. In 1854, George Boole had published a book in which he describes the Boolean Algebra. In this, he considered that 0 would stand for *falsehood* and 1 would stand for *truth*. This Boolean Algebra has contributed to the

innovation of telephone switching circuits as well as computers.Vaucanson's duck in 1844 was an extraordinary engineering gadget which was assigned the function of eating, drinking and digesting. He called it the *Automaton.* Unfortunately, the original version of it was burnt in a museum but several copies of it were made beforehand.

Growth of AI

[5] AI has been in progress for over 200 years and it has been the key aspect of economic development since the Industrial Revolution. Through the years, the common people have seen the spinning jenny, the steam engine, production of electricity and development of computer chips. Looking over these past years we can say that the economic growth has been significantlypowered by automation. During the Industrial Revolution, industrial and production processes used steam to automate their machines and then the use of electricity was observed. This process was then progressed by using transistors, semiconductors and relays. The current world now sees MRI machines, computerized automobile machines and self-driving vehicles. [6] Since the 1970s, expansion of AI has taken place into various research fields, machine learning, and intelligent control. The rapid advancement and growth of AI is boosted by the research and by IT resources. Since the Internet and the online world is experiencing a rising population of users, the society saw the emergence of sensors, e-commerce development and the steady advancement of the information community. This has led to a new phase and an evolutionary stage termed as AI 2.0. As demands made by the society keep on increasing and changing, there have been respective modifications made in the AI research especially since many fields of constant activity require AI development. The idea of AI is being used to produce new gadgets and idea that will be useful in the present as well as in the future.

AI in Healthcare Appliances

[7] The fast-developing sensing techniques as well as many organic electronics have the most splendid properties such as fantastic flexibility, affordability, and many other identities. Their contribution to the development of pressure sensors is what makes them so significant in the modern world.A splendid application of pressure sensors is mobile biomonitoring. The pressure sensors made of flexible organic material is the reason why many applications of it have been appearing. Since pressure sensors have been doing so well in the past few decades, they have also been used in electronical devices as well. E-skin which have been improved and worked on are used in artificially intelligent systems. It's a challenge to create pressure sensors which have dependable sensitivity and stability but these pressure sensors have proved to be a major part of future electronics. [8] Human life has strengthened to a great extent with the increasing development in AI. Many life-threatening diseases such as cancer and diabetes have been detected, cured and prevented using technology developed by artificial intelligence. They assist in finding right treatments and allow a physician to make the efficient decision to provide suitable care to patients. It also provides some relief to doctors as they don't have to push in information into their brains as they had in the early years. As the excellence of AI increases by time, so does the quality of service that is given to the patients. The advanced arithmetical algorithm that is used in AI allows doctors to give a better and faster diagnosis. The time that is taken to discover drugs used for treatment has decreased as AI supports the discovery of new compounds in a much cheaper, faster and safer way. These days, surgical procedures have been facilitated by introducing computer-assisted surgery or robot-assisted surgery. In this, the surgeon or doctor uses the computer to control the robotic arms which uses manipulators

and end-effectors to perform the actual surgery on the patient. [9] AI has shown some potential and innovative applications in the field of medicine and healthcare.The reason why AI becomes more superior than actual human surgeons and doctors is because nowadays, huge sets of data are required for a patient. So, it is safe to say that AI can help doctors to in productive decision making as well as necessary personalized medicines. However, in the long run, overdependence on AI carries severe risks. The critical thinking and experience of an actual human being may be ignored at times but in reality, the critical reasoning of a human is required at all times especially when the patient's life is at risk. In the 1980s, a system of AI called 'expert systems' was introduced and was highly promoted in Japan by the government. Although this form had not produced any economical breakthrough, key developments were made and the AI research benefited from this. More efficient image recognition was observed when Convolutional Neural Networks were equipped with labelled datasets. When Google, Amazon, Facebook, Apple and Microsoft (GAFAM) made heavy investments in the field of healthcare, the clinical studies have been more accurate than the 'classical' clinical studies. Virtual software has allowed professionals to get a better understanding of the patient's condition before moving ahead which allows them to give proper treatment accordingly. Intra-oral scanners, which use software designed by various machine learning types, are used to see two dental images side by side. Artificial intelligence has been used for the transition of 2D to 3D images which allows the professionals perform their task with much more efficiency and accuracy.

AI in Manufacturing and Production
[10] Advancement in manufacture and production takes place every day. To keep up with this advancement, new mechanisms have come into the picture. This new era sees the collaboration of manufacture with new AI technologies. The fusion of AI information and data with the physical world has led to a new evolutionary stage: AI 2.0. Artificial intelligence allows the development of models and architecture in the field of intelligent manufacturing. Intelligent manufacturing can be referred to the integration of new technology as well as intelligent information and science with the system of production. [11] The Industry 4.0 has urged the concept of smart manufacturing to be the industrial revolution which has led to the considerable expansion of the global economy. The gradual shift from digital manufacturing to intelligent manufacturing has started in several enterprises. In the present time, AI based technologies have become the foundation of intelligent manufacturing. Algorithms are used to manufacture desired products in various smart industries. [12] AI has led to the massive improvement of current items and products as well as invention of new industrial products of better quality. The growing demand of better-quality food products of high quality as well as those that are healthy has been escalating. Of course, as time goes by and more people start educating themselves, the production of higher quality food becomes an absolute must. To meet these demands, intelligent machines have been developed to view products in an equivalent way that the customers do. Those who have employed the fundamental idea of AI in their manufacturing system have seen an increase in their success rate. Multiple AI techniques have been and still are being used such as artificial neural networks, hybrid methodology and data mining procedures.

AI in Security and Surveillance
[13] Terrorism these days have become a serious menace to national security, society and theeconomy. The information technology field has made several developments and useful tools like

image and video processing, data integration and data mining. When we compare intelligence and security informatics (ISI) with biomedical informatics, we see that they both have a lot in common. Both of them are looking for new methods and approaches to make useful innovations of existing technologies. While biomedical informatics contribute to medicine and biology, ISI contribute in the art of criminology and research based on terrorism. [14] The National Security Agency (NSA) in October of the year 2016, Director Michael Rogers expressed that the agency views artificial intelligence to be the "groundwork to the future of cybersecurity." Cybersecurity has proved to be less labour-based than the conventional human surveillance. AI also plays a major role in the field of information security. Natural language perceptive as well as numerous forms of machine language can permit a computer to detect unknown data and its respective amplifiers. AI based technological systems have already been incorporated into the forces of militaries. AI can predict the stresses that may be implied on the force as well as predict if they will face psychological or physical harm. [15] Many incidents go unnoticed and undetected during the time of the unfortunate event due to human operators or eyeballing CCTV cameras.In such instances, we don't really find the use of them when fearful crimes happen at a that particular moment. Consequently, CCTV camera footage are just used asreliable evidence for investigation. Intruder detection is based on the system of fence trespassing detection which gives signal to an operator that they have an intruder that has passed the fence. The system of 'Loitering detection' can detect individuals who stay in an area of control for an extended period of time. In the current situations, many technologies give false alarms in various situations. To solve this situation, emerging techniques are being developed using AI.

AI in Education

[16] AI has made many progressions over the past 25 years in the field of education. The main challenge is to create a special kind of one-on-one tutoring system where there is a student can learn without needing much physical things around them. 'Faster classrooms' have been built in this process which saves a lot of energy as well as valuable time. Students can now easily access their required document or reference any time they want without having to wait for the actual physical document. With the introduction of AI in the education system, teachers are no longer required to collect every piece of information for their learners. Instead, they guide as well as support their pupil in seeking the required information, making them the desired independent developers. Files can be accessed by both teachers and students that makes it easier to cooperate with each other. [17] The significant upgrade in this system of learning has impacted the content of learning and the curriculum personalized by the student's needs. AI has also made the instructor's jobs smoother as they can perform their duties with much more ease. Correcting papers becomes much more efficient and time-saving for the educators and students can observe their corrected paper at an instant. Fast communication between the instructor and the learner allows the learner to gain the knowledge at a particular desired instant. [18] The computer assisted learning (CAL) allows the functioning of alternatives that allows the proper support of student's learning with digital technology. The Education Management Information System (EMIS) is a group of services that can collect, store and examine information for educational uses. The advanced functioning of Education Management Information System (EMIS) allows an educational community to access files and documents that can be also be stored for future use.

Advantages of AI

[19] One important advantage of artificial intelligence is that the strategic decisions that are made are fact based rather than opinions. This makes them a more reliable source rather than asking

people who usually base their ideas based on their own opinions. Machines, who do not require any sleep like humans, overcome the disadvantage of being tired and unable to work. When we train an artificial mind with a specific subject, it can be replicated with ease by reducing the time that would rather be required. [20] It also assures permanency and is also cost-effective. The speed that is seen while trying to solve problems is also very convenient, thus saving time. Valuable information can also be easily stored and saved that prevents it from getting lost. For instance, many technologies tend to save files even if we forget to physically save it for further usage. AI also allows the development of a system which can increase its performance and relevance. [21] It takes on the stressful work that humans often struggle with. One can use AI technologies to look into undiscovered places, like the various places in the depths of ocean and the outer space. This ensures the safety of human beings as well as allows us to find out useful information. While working with AI we find less errors in the outputs making them a more reliable source. [22] Machine learning allows many companies to make better and crucial decisions and also assists them in solving problems. Not only do companies benefit from this but the entire world is able to find some assistance through suitable devices. Human intervention is not required for machine learning and can easily identify various trends and patterns. There are vast numbers of diverse applications of machine learning. [23] AI is used to analyze molecular composition of many medicinal drugs and so it is able to ensure the utmostsafety of patients creating a lesser chance of severe after effects. Hospitals also use computer devices to detect the patients that are at the most risk enabling them to save a patient's life. It also reduces the potential risk of human life while working for the mining industries. These mining companies are able to create numerous devices that could be operated underground in the unbearable and dangerous conditions without the presence of any human being.

Challenges or Dis-advantages of AI

[24] One concerning disadvantage of AI is the effect of the reduced number of job opportunities. As more devices start replacing human work, the rapid increase in unemployment comes into the picture. Logically speaking, machines and technologies may have the ability to translate human like behavior but the creativity and the appropriate communication skills cannot be displayed by artificially made technologies. In various cases, interaction between two creative minds becomes reasonably essential, which AI based devices cannot be trusted with. AI replacing human minds in the field of medicine is a serious topic of concern as the benefits that are needed from it may be disturbed causing extreme harm. [25] If AI soon starts replacing human, then it will cause a huge rise in the rate of unemployment, leading to poverty, depression and more criminal activities. The over reliance on AI can lead to various problems. For instance, if a system malfunctions, then incorrect answers will be produced and one cannot find the reason behind the error killing a lot of time. While using AI based technologies, one may notice the lack of creativity in its outcomes. [26] The constant development of machines and advanced technologies can lead to unemployment. Surgical processes which need immense precision have been replaced by appropriate technologies which work 'more efficiently'. This is when the thought of 'robots taking over the planet' haunts our minds. The fear of constant judgement also takes place as devices are designed to record the things happening around them at every second. [27] A lot of money, time and energy is also used up while trying to create such AI based devices but it has also made a human being both mentally and physically inactive. While trying to work in teams, machines cannot have the same communicative skills or develop bonds with a person. Machines, at times, do not have the ability to 'think out of the

box' which is a crucial aspect of success. The whole purpose of creation is to make something that is unique and something that stands out from the rest. [28] AI based learning and education can lead to many disadvantages. Depending on the idea of E-learning as the source of education can lead to lack of interaction because of the remoteness surrounding the student and teacher. This can cause a decrease in the learning outcome and therefore, the value of e-learning deteriorates. A student's communication skills are affected when there is no face-to-face interaction. The teacher fails to find out whether the student is gaining from virtual lessons or not especially during the class time. A child's discipline can also never be monitored through the process of E-learning. A teacher cannot keep a record of what the student does and it becomes difficult to penalize the student for what they have done that is considered immoral.

Conclusion

From what I know, artificial intelligence has its ups and downs but at the end of the day it has made human life much simpler. We are able to contact the people we know at an instant and share our experiences and knowledge with the universe. As time goes on, better and stronger devices come into existence and never fail to show ustheir worth in the current complex society but there is always a fear of artificial intelligence 'taking over the world'. We tend to believe that soon "robots" will replace human work. This leads to the decrease of human value as a whole. Moreover, it becomes very unsafe to have complete reliance on such devices.As we think about how artificial intelligence contributes to our daily lives, we think about the devices which help us with our everyday activities and we realize how inconvenient it would become if they never were created.They assist us in uncountable daily activities starting from the moment we open our eyes and hear the ringing sound of the alarm clock. The world has seen many advancements in the field of artificial intelligence. Some may have had treacherous impacts on society but the learning gained from such creations have led to the making of a smarter world. The problem-solving minds of human beings have put them on top of the triangle and so we believe that it is our duty to create and control. Artificial intelligence has proved to human beings that both work and time can be saved by using meaningful devices and that the advantages served by these machines can never be ignored.Hence, the concept of artificial intelligence becomes inescapable.

References

Aghion, P., Jones, B. F., & Jones, C. I. (2019). *9. Artificial Intelligence and Economic Growth* (pp. 237-290). University of Chicago Press.

Amisha, P. M., Pathania, M., & Rathaur, V. K. (2019). Overview of artificial intelligence in medicine. *Journal of family medicine and primary care*, *8*(7), 2328.

Arkorful, V., & Abaidoo, N. (2015). The role of e-learning, advantages and disadvantages of its adoption in higher education. *International Journal of Instructional Technology and Distance Learning*, *12*(1), 29-42.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Bouletreau, P., Makaremi, M., Ibrahim, B., Louvrier, A., & Sigaux, N. (2019). Artificial intelligence: applications in orthognathic surgery. *Journal of stomatology, oral and maxillofacial surgery*, *120*(4), 347-354.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Charniak, E. (1985). *Introduction to artificial intelligence*. Pearson Education India.

Chen, H., & Wang, F. Y. (2005). Guest editors' introduction: Artificial intelligence for homeland security. *IEEE intelligent systems*, *20*(5), 12-16.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Gong, S., Loy, C. C., & Xiang, T. (2011). Security and surveillance. In *Visual analysis of humans* (pp. 455-472). Springer, London.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., & Scharre, P. (2018). *Artificial intelligence and international security*. Center for a New American Security..

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

McCarthy, J. (2007). What is artificial intelligence?.

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In *Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi*.

Mohammadi, V., & Minaei, S. (2019). Artificial intelligence in the production process. In *Engineering tools in the beverage industry* (pp. 27-63). Woodhead Publishing.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Nadimpalli, M. (2017). Artificial intelligence risks and benefits. *International Journal of Innovative Research in Science, Engineering and Technology*, *6*(6).

Nilsson, N. J. (2009). *The quest for artificial intelligence*. Cambridge University Press.

Pan, Y. (2016). Heading toward artificial intelligence 2.0. *Engineering*, *2*(4), 409-413.

Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). Artificial intelligence in education: Challenges and opportunities for sustainable development.

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education*, *26*(2), 582-599.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Tao, B., Díaz, V., & Guerra, Y. (2019). Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher. *Arctic Journal*, *72*(12), 30-50.

Wan, J., Li, X., Dai, H. N., Kusiak, A., Martínez-García, M., & Li, D. (2020). Artificial-intelligence-driven customized manufacturing factory: key technologies, applications, and challenges. *Proceedings of the IEEE*, *109*(4), 377-398.

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. *Materials Horizons*, *2*(2), 140-156.

ARTIFICIAL INTELLIGENCE IN CYBER-DEFENSE TECHNOLOGIES

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Abstract

One of the most important things in the world, today is privacy. More than essential things such as food, shelter, etc., people need to worry more about invasion of their private life. With the advancement of technologies to provide us more comfort in our lives, even the bad side of it has surfaced more. Hackers use more complex algorithms to crack a network and steal very sensitive and confidential data, which might affect a single person or sometimes as large as a country. In this paper, we are going to see about the importance of cyber security and the various technologies involved in it and also how the advancement of artificial intelligence, machine learning and its related concepts improve cyber-defense. Every technology has drawbacks. So we will also look into the different issues we face while using AI including the risks in using them too. While trying to prevent network intrusion, we leave all our information to a software which is unpredictable and difficult to comprehend how it thinks.

Keywords: Artificial Intelligence, AI, Cyber-Defense, Privacy, Network Intrusion, Cyber security, Machine Learning

Introduction

The seamless connectivity between the systems of the dynamic world needs a very effective defense system. The technologies involved are progressively improving day by day with the increasing demand for privacy, money policy, information sharing and so on. 'Artificial Intelligence' is a boon for the cyber- security companies to provide the user everything mentioned above. Why is this required? The human mind is not capable of performing various complex tasks at the same time. The various ways in which an infiltrator might breach into a secured system is an example of a situation like that. AI will take care of this by reading through all possibilities of a breach by using concepts such as brute force protection in real time. This will not only help in getting rid of an individual's cyber risks but also protecting the ultra-sensitive information possessed by organizations, governments, and armies which shouldn't be leaked to the general public. The complete avoidance of human intervention can lead to improved defensive technologies like detection and prevention of network intrusion and fraud, botnet detection, an eye over hacking entities and much more. is all possible due to the of AI as these algorithms concepts like computational, fuzzy logic, intelligent agents, immune systems, data mining, pattern recognition, etc., In the year 2016, almost 3 billion accounts of 'Yahoo!' were compromised conveying all information such as email addresses, passwords, date of birth and contact information to the netizens thereby flooding the internet. Incidents like these can be avoided if there was an active supervision on all gateways that are breachable and a swift response to any breach by quarantining any malware present. This paper will feed you all the information about how these kinds of issues can be resolved using Artificial Intelligence and will give you more insight about cybersecurity needs and demands and also the disadvantages of involving AI in catering these needs.

Literary Survey

[1] There are a lot of different ways in which cyber security can be boosted with the help of computational intelligence. Some of which are fuzzy logic, artificial immune systems, neural networks, machine learning, etc., But any cyber defense system can't beat the human immune system. The mechanism in which our body works to defend our system is so perfect that its quite impossible to mimic it into an algorithm but at least some concepts injecting vaccine so that our body can learn how to attack a pathogen can be taught to a computer hence forming a more capable defense system.[2] Many problems occur in the world of the internet. In brief it can be listed as in five ways, firstly the problem cyber threats making the life of common people hectic. The advanced persistent threats which can even provoke a situation of national security.The lack of research in the field poses a huge problem as no one knows what is happening to their system. The only way to solve such threats is to improve the technology of artificial intelligence and implementing in the domain of security.[3] On implementing artificial intelligence in cybersecurity there would obviously be problems waiting to attack the developer. But what if the problem was not on implementation and what if there was a problem but the AI fixes it on its own, meaning the systems is completely functioning on its own then who is governing its actions. The concept of psychopathology is used in this kind of cases. There would always be some kind of fault modes in an intelligent machine, maybe some kind of interpretation is wrong or the process is done for a different application entirely or there is an entirely a different kind of problem. When this type of problems arises is it right to let the AI to function on its own and fix it? These types of problems are new and requires a lot of research in the field such as" psychopathology of AI" as this is not just about an AI but it also concerns for the use of cybersecurity as well.[4] Along the advancing of artificial intelligence implemented in cyber defense, the different types of problems that occur also tend to improve. One of them is the DDos attacks or 'distributed denial of service' attacks. Basically, these programs get inside a network and start putting up unnecessary authentication of accessing data that might even be visible publicly and ultimately disable the entire network system. So, problems like these arise every now then but solutions are also created, might not be immediate but very soon. Like this there are many obstructions to improvement and to cross all these obstructions AI seems to be the answers by many developers because the use of machine learning under AI will never fail to succeed if implemented properly. Learning how the attacks happen and how to stop a malware will eventually beat it.[5] Cyberbullying can be seen an aftereffect of one's cyber defense system fails to tackle a malware or a break in. Many different people and companies are affected by this means, leaving their private information in jeopardy to the open internet. Of course, cyberbullying doesn't consist of only blackmail or hacking into private systems to make an entity unstable, it also consists of crimes like cyberstalking, unparliamentary comments and discrimination in social media, copyright crimes, etc. Now how to avoid these types of crimes. Common sense reasoning in cyberbullying is basically figuring out which content is bad or good based on the rules set by the society or oneself. Implementing this to tackle cyberbullying can be done through machine learning and hence the reason for AI to be best solution to stop cyberbullying.[6] Many economic and environmental factors pressure building operators and owners to adopt 'IoT' into their buildings. This has led to increased cost savings, power efficiency and process visibility. But integration of these technologies poses various design and cyber security challenges. We need to absolutely consider these challenges because failure can result in mass deaths and leakage of information. The various technologies that are used are CCTV motion

detection, RFID tokens and environment monitoring systems. In addition to this, research is being done on sensors which use artificial intelligence. They gather behavioral data, which can precisely predict why or how the society might react to a particular situation. Advancement in this field of work can lead to the development of a system that can learn to recognize patterns to respond to threats immediately.[7] Security used in communication is the main reason for cyber-attacks rather than hardware failure. Research is going on in identifying the failure in the system. This is where AI comes in. Machine learning helps AI to learn from data and access time. The human brain is not capable of detecting varieties of variables at the same time. It faces difficulty with coping up with environments which different while decision making. That's why AI is used. One of the most important processes in network security is intrusion detection. So, we create an intrusion detection system. It actually works in a very interesting way. It monitors the network by checking whether the system is overloaded. If it's the case, the AI will collect all the connected systems' information. This is very efficient because system's execution will not be affected during the process.[8] The safety of AI can be improved by the ideas of cybersecurity experts. But any security system has a chance of failure which is inevitable. And when a super intelligent system fails, the consequences will be catastrophic. There has been a lot of incidents at which AI has failed. Deadly accidents have been caused in the earlier days of AI. The failures can be classified into mistakes caused during the performance and learning phase. The incidents were such as, a software learned to cheat instead of making discoveries, a nuclear attack warning system falsely alerted that a nuclear attack is taking place, etc., In addition to AI failing to protect a network, AI itself could be a threat to the network. We haven't got lots of ways to analyze, monitor and visualize the performance these security systems. Because we don't even know what the software will do after it runs.[9] One of the fields that could be the most benefitted by Artificial Intelligence is cyber security. Since, when the first DoS attack happened in 1988, there has been a large number of cyber-attacks. Security systems should constantly adjust to the changing environment. As a lot of flexibility and adaptability is needed, humans alone can't find and fight these threats. And when AI was discovered, it was thought that it could break all these boundaries. There is a large amount of data, and the data was transferred at high speeds. The heterogeneity of the sources of data also made it difficult for humans to gather cyber intelligence. These issues could be easily mitigated through Artificial Intelligence. Neural networks that could learn and process data exactly like the human brain uses past network attacks and activities to prevent future exploits. But any system has drawbacks. AI has drawbacks such as data privacy, lack of regulations and ethical concerns.[10] The solutions for preventing cyber security incidents is becoming more and more complex. So, it's hard to develop a code that can fight these attacks. So, the code needed can only be developed by a being which can process data faster than a human being. And that's where AI comes in. But as many institutes have predicted, rapid development of computing intelligence will occur soon. They fear that a 'Singularity' might occur i.e., AI becoming smarter than humans. But before all that AI's cyber capabilities should not become accessible by offenders (hackers, phishers) as the tech might help them more in breaking into user accounts and leaking sensitive information.

Findings

The development of artificial intelligence is substantially increasing as the day goes along with it we have the different types of malware are also improving. So, from this we see as the technology increase in defending our systems there will also be problems arising in it too. We found different

types of problems are improving like DDos, forced authentication, intrusion algorithms and much more. But the ways to tackle such problems are also found like brute force management, application of computational intelligence which has a sub category of neural networks, artificial immune systems, fuzzy logics to create confusion to malware and of course machine learning as well. Several technologies in IOT, RFID, CCTV are also used in our day to day life and providing security to these is one of main implementation of AI. Cyberbullying is also seen to be decreasing due to this and many theories like common sense reasoning is also used. Many industrial, private sectors are affected by network intrusion and till now the only reputed solution to solve all these problems is the implementation of AI defense.

Recommendations and Conclusion

The number of cybercrimes are increasing very rapidly. Many companies have provided their products and support to stop all these. To find a prominent end to this impossible. The human mind will never be able to comprehend all types of possible breaches in a network system but an AI can. On the contrary AI itself can be a threat to network and its related entities too. The laws in cyber crime are not that helpful as if you don't know who to blame then you can't keep anyone responsible to the damage caused. Hence there should be a governing body always looking through the wide network, the internet, to subdue these kinds of problems. Moreover, the governing body can find people who are indulged in such crimes and then correct their morals and use them as resources to fight cybercrimes with the continuous support of artificial intelligence.

References

Anitha, A., Paul, G., & Kumari, S. (2016). A Cyber defence using Artificial Intelligence. International Journal of Pharmacy and Technology, 8(4).

Atkinson, D. J. (2015, March).Emerging cyber-security issues of autonomy and the psychopathology of intelligent machines. In Foundations of Autonomy and Its (Cyber) Threats: From Individuals to Interdependence: Papers from the 2015 AAAI Spring Symposium, Palo Alto, CA. http://www. aaai. org/ocs/index. php/SSS/SSS15/paper/viewFile/10219/10049

Dasgupta, D. (2006, October). Computational intelligence in cyber security. In Computational Intelligence for Homeland Security and Personal Safety, Proceedings of the 2006 IEEE International Conference on (pp. 2-3). IEEE.

Dinakar, K., Jones, B., Havasi, C., Lieberman, H., & Picard, R. (2012). Common sense reasoning for detection, prevention, and mitigation of cyberbullying. ACM Transactions on Interactive Intelligent Systems (TiiS), 2(3), 18.

Mittu, R., & Lawless, W. (2015, March). Human factors in cybersecurity and the role for ai. In Foundations of Autonomy and Its (Cyber) Threats: From Individual to Interdependence, AAAI Spring Symposium Series (pp. 39-43).

Mylrea, M., &Gourisetti, S. N. G. (2017). Cybersecurity and Optimization in Smart "Autonomous" Buildings. In Autonomy and Artificial Intelligence: A Threat or Savior? (pp. 263-294). Springer, Cham.

Patil, P. (2016). Artificial intelligence in cybersecurity. International Journal of Research in Computer Applications and Robotics, 4(5), 1-5.

Rajbanshi, A., Bhimrajka, S., & Raina, C. K. (2017). Artificial Intelligence in Cyber Security

Wirkuttis, N., & Klein, H. (2017). Artificial Intelligence in Cybersecurity. Cyber Intelligence, and Security Journal, 1, 21-3.

Yampolskiy, R. V., & Spellchecker, M. S. (2016). artificial intelligence safety and cybersecurity: a timeline of AI failures. arXiv preprint arXiv:1610.07997.

THE WORLD OF ARTIFICIAL INTELLIGENCE

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What is Artificial Intelligence?

[1][2] Artificial Intelligence is a field of research in science and engineering which focuses on understanding intelligent behavior. [3] Intelligent behavior not only means being capable of solving highly complex problems, but also being able to converse, see, walk; in general, being able to perform tasks which most humans easily can. [2] AI is dedicated to the creation of smart machines and programs that can not only solve difficult problems, but also can perform human like tasks.

History of AI

[4] The word Artificial Intelligence may be very recent, but the idea of machines or automated systems can be seen since ancient times. In one of his poetry, Homer mentions chairs called 'tripods' that were automated. He also mentions 'golden attendants', that were capable of movement. Many more such examples can be seen depicted in the paintings, sculptures and books of olden times.

In 1495, Leonardo Da Vinci, created designs for a robot, that was very life-like. He never brought his design to reality, but according to his sketches it was capable simple movement. [6] In 1642, a mechanical calculator was invented by Blaise Pascal. It was named as the 'Pascaline'. This was followed by the creation of 'Step Reckoner', an improved calculator, by Gottfried Leibniz in 1673. [4] In 1738, Jacques de Vaucanson, a French inventor, created a mechanized duck. It was capable of simple motions and could also make duck-like sounds. These two inventions are the most notable of the many that was created during this period. Other than these actual inventions a lot of artists depicted automated machines and robots in their plays, stories and paintings.

[5][6] The first person to develop a language for logical reasoning was George Boole. After this development, in 1847, Alan M. Turing, a mathematician, built the first automated machine called Turing-machine in 1936, which succeeded in decrypting German intelligence messages in 1941 during World War II. In 1944, Eckert and Mauchly succeeded in developing ENIAC (Electronic Numerator, Integrator and Computer). This was followed by Walter Pitts and Warren McCulloch's design of an artificial neuron. Donald Hebb modified the design of the neuron in 1949, granting it with the possibility to learn. Finally in 1951, the first ever neural computer was built by Dean Edmonds and Marvin Minsky.

[5] John McCarthy was the first person to define the term Artificial Intelligence, which brought the concept of human-like, smart machines to limelight. Within a year, researchers succeeded in creating and testing the first problem solver, a machine that is capable of solving general problems.

[5][6] McCarthy, the father of Artificial Intelligence, in 1957, developed a language named LISP. It was capable of designing AI software. In 1961, T. Evans created a program called 'ANALOGY', that was able to solve analogical problems seen in IQ tests. A program named 'STUDENT' was developed by D. Bobrow in 1964. This program was capable of solving algebraic word problems as this program could understand human language to some extent.

In 1967, a few knowledge-based programs came into picture; 'DENDRAL' for scientific reasoning, 'MACSYMA' for mathematics and 'Mac Hack' for chess-playing.

'ARPANET' was established in 1969. It was the predecessor to the internet. In the same year a mobile intelligence named 'Shakey' was created. This was followed by the creation of 'AARON' in 1971. This was an automated art-program created by H. Cohen. In 1972, Alain Colmerauer, built a programming language called PROLOG. Few years later, in 1981 AI was commercialized.

Growth of AI

[6] The type of AI, being researched on, has been continuously changed, due to both further advancements in sciences and setbacks faced by the researchers and inventors. [7] The journey of AI development was not smooth; 3 major setbacks occurred within 60 years. The first setback was in 1973 when AI development was still in its infancy. A report was written and published by James Lighthill highlighting the hindrances in the growth of AI in the fields of automation, robotics and medicine particularly the central nervous system. In his report James called for the termination of the AI related researches being carried out in these fields.

The second failure occurred when the development of a fifth-generation AI came to naught, in Japan even after spending 850 million dollars till 1992. The research to develop this smart computer began in 1982. The goal was to create an AI that was capable of speech and listening. It should also be able to gather, extrapolate and process knowledge.

The creation of Cyc, an encyclopedia of knowledge by Stanford University marked the third setback in the growth of AI. Its creation began in the year 1984 and waned out by the late 1900s. The goal was to create an AI that was capable of inferring data to a human-level. It was able to store large amounts of data and could also be linked to external databases like DBpedia, Freebase and Central Intelligence Agency (CIA), but it failed to reach its actual goal. Despite these setbacks AI has continued to develop through the years. Even now its continuously evolving, depending on the needs of the era.

[8] During the early years of AI development, focus was on creating machines or systems that could play games and solve logical or mathematical problems. This was due to the fact the scientists of that time considered intelligence, synonym to being able to solve complex problems. Keeping this theme in mind, 'The Logic Theorist', an AI program was created that could solve and find proofs for equations, sometimes much better than the already found proofs. 'GPS', another AI program was created during the same time and could solve toy problems. AI programs that could play Checkers and Chess were also developed. In 1952, Arthur Samuel designed a Checkers' playing software, where two copies could play against each other. They were capable of learning from each other. In 1962, his Checkers' program defeated the former Checkers champion.

By the mid-1950s, focus in AI research shifted to strong AI that could imitate a human's mind. 'Eliza', an AI program developed by Joseph Weizenbaum in 1966 was capable of holding conversations with patients and could do a passable imitation of a psychologist. It was only able to do a passable imitation as it lacked emotions.

Other than these AI programs, systems that could solve practical problems were also developed. For example, 'Dendral', an AI software which was developed in 1965 by Stanford University. It used knowledge of basic chemistry and mass spectrometry graphs to study unknown organic molecules. 'Macsyma', an AI system created by Carl Engelman, is also an example of such systems. It was able to solve problems on integration.

After this in 1960s, focus was changed to bottom-up approach from top-down (Strong AI) approach. Keeping this trend in mind few developments in the fields of neurons and learning were

made. This includes the creation of 'perceptron' by Frank Rosenblatt. This was followed by the beginning of AI Winter in the 1970s, during which AI development suffered major setbacks as described earlier. Though there were setbacks, researches in some fields of AI continued. This includes evolution of expert systems like 'MYCIN'.

The AI Winter ended around the late 1980s, after which focus was diverted in creating Weak AI, i.e., AI systems that concentrated on solving particular problems. New fields of research were introduced as well. Most notable of them was research on Ant Colony Optimization (ACO), a biological field.

[9] Development of AI has shown tremendous growth since the beginning of the 21st century. It is the era of interdisciplinary science. New researches in fields of cybernetics, linguistics and automation are continuously being going on. New online systems like AMiner, Google Scholar and Microsoft Academic Services were developed to provide people access to scholarly big data.

[7] Nowadays there is rarely any sector that has not incorporated AI systems. From industries to homes, AI can be seen everywhere. Many large technical firms like Google, Twitter, Microsoft, Apple and Intel are all incorporating AI. Google has boasted use of deep learning in many of its research projects. Recently Microsoft created 'Xiaobing', a robot that could chat. It is also working on incorporating AI technologies in the internet through LinkedIn application. IBM's Watson system is now being used in hospitals to scan for cancer histories in the patients' family. This helps in providing required treatments and can even prevent the cancer from reaching severe stages. Further research in various fields is continuously being carried out.

AI in Healthcare and Medicine

[10] Leonardo Da Vinci can be considered as the great mind behind development of AI in healthcare. A lot of robotic models used in healthcare are created on the basis of the designs sketched by him. AI is used in medicine and healthcare in two ways; virtual and physical.

AI can be used to provide active counsel in treatment decisions taken by the physicians. They can be also used in the management sectors; the best example being electronic records of patients. This constitutes the virtual method of incorporating AI in healthcare. Usage of robot in taking care of patients especially the elderly patients and robots acting as assistants to surgeons forms the physical method. [11] Intelligent prosthetics are also a part of the physical method of usage of AI in healthcare. [10] Nowadays, 'nanorobots' are used as drug delivery system. They are able to target specific areas in the human body to supply the required drugs.

[11] Nowadays, appointments to a hospital can be scheduled online. Reminders of follow-up check-ups and vaccination due dates especially for children are done using AI. 'DXplain' is an AI system developed to generate a list of differentials based on the patients' symptoms. It basically acts as guide to a doctor in their treatment decisions. It is also used to educate the medical students. Germ watcher is an AI software that spot and analyze hospital acquired infections. It was created by University of Washington. 'Babylon' is another AI system which allows people to consult their doctors online. It also has the feature to monitor a person's health. 'Ai Cure' is a software developed by The National Institute of Health. It is capable of monitoring patients' medicine usage using webcam of smartphones. It prevents people from disobeying their doctor's orders.

[11] [13] AI systems are also being used in therapy to treat social anxiety especially in youth at an early stage. Most of the AI systems that can be used to treat mental health problems are still in

development; the best example being 'MOST' (The moderated online social therapy) project. Till now, it has been successfully applied in six studies, though it is still in development.

[14] AI through the usage of its sub-field Machine Learning (ML) is able to identify suicide risk factors, which can be used to further program an AI to find individuals who are at a suicide risk in the near future, thus being able to provide them with appropriate medical care. This has not been fully perfected, but researches are going on to make it more reliable.

AI has been implemented in suicide management. They help in evaluating patients' and suggesting treatments and follow ups. They also screen individuals at imminent suicide risk, thus helping in providing immediate care.

As a part of helping in preventing suicide AI that are able to hold conversations using text or voice have been developed. They are able to talk to individuals and act as conservational agents.

[11][12] Intelligent health trackers like Apple watches and Fitbits can keep track of one's sleep levels, heart rates, activity levels and even ECG. These are very helpful as they give the medical practitioners an idea about the overall health condition of the patients. ECG tracking is especially helpful as it helps in early detection of Atrial Fibrillation. The best example of AI software that keeps track of a patients' ECG is 'Kardia' created by 'AliveCor'. Similarly, blood glucose level tracking AI monitors are also in use. They help people in keeping track of their glucose levels enabling them to regulate their blood glucose. This helps in reducing the chances of a hypoglycemic episode. To detect epilepsy seizures, a monitoring device named 'Embrace' was developed. It was created by 'Empatica'. It can be worn on the wrist and on detection of a seizure it sends an alert to one's relatives and doctors, along with the person's location.

[11] The field of surgeries was revolutionized with the invention of The Da Vinci robotic surgical system. It was created by Intuitive surgicals. It has mechanized arms that can imitate a surgeon's hand motions with much better precision. It also provides a magnified 3D view of the area where surgery needs to be performed, thus providing assistance to the surgeon. It especially proved to be helpful in the fields of urology and gynecology.

[12] Gastroenterologists have successfully employed artificial intelligence to detect various ailments. They make use of artificial neural networks for image processing in ultrasound and endoscopy. They are able to detect colonic polyps as well as diagnose ailments like atrophic gastritis.

Thus, implementation of these smart machines in health care is beneficial and increases efficiency of the medical system. New advances are continuously made in this field.

AI in Manufacturing and Production

[15] The incorporation of artificial intelligence in industries have revolutionized the manufacturing and production process. Development of sensor technologies and computing methods have resulted in smart and efficient manufacturing. Nowadays, artificial intelligence systems are used to analyze and monitor manufacturing processes. They are also capable of making decisions in regards to the processes without human input. Using these robotic AI systems that can process data and connect industrial devices in Manufacturing and Production is referred to as Smart Manufacturing.

[16] Manufacturing and Industry 4.0 is the new system of technology incorporated with AI that can be used to enhance manufacturing processes. Though still developing, it has been adopted by a number of industries now referred to as 'Lighthouse' industries, and have proved to be beneficial. It has also improved productivity, flexibility, and the speed of production. Improvement in quality of

goods produced was also seen. This improvement in quality has been achieved through the implementation of prognostic and health management systems that continuously observe the industrial plant set-up, and alerts the personals when maintenance is required.

[17] Nowadays, Distributed Artificial Intelligence system is in use in many production companies. It follows a hierarchical pattern to solve problems. It performs its functions by breaking down the problem into small sections or parts. Each part is then handled by one of its agents and together these smart agents reach to a solution. Actually, these agents list out all the possible solutions of the problem. A fuzzy coordination system then selects the most appropriate solution to be implemented.

AI in Security and Surveillance

[18]AI is very useful in detecting and thus preventing terrorist attacks. AI systems can analyze activity and communication patterns at a much more rapid pace than when done manually. This enables the targeted countries to take timely measure and save thousands of lives. Infrastructures like bridges and roads are likely targets of terrorist activities. Having AI surveillance that can identify suspicious behavior and alert the required personnel in timely manner, is beneficial and can prevent deaths of hundreds.

[19] Incorporating Artificial Intelligence in the various robotic systems already in use in the military will increase its efficiency and strength. AI with webcams or motion detecting sensors will be beneficial in collecting information. [20] Small robots with sensors capable of hiding themselves in strategic positions can be deployed to gather data. Larger robots with the ability to supervise the smaller ones should also be used. These larger robots must be capable to commute the gathered information to the required personnel. Such a system increases the efficacy and efficiency of defense tremendously. [19] Currently, neural networks are in use to classify images gathered by drones.

Artificial Intelligence systems are also beneficial to Homeland and Border security divisions. To detect false distress signals at the coast, US government employed the usage of voice recognition systems that are able to create a physical profile of the person on the basis of voice. AI systems were able to analyze information gathered by Transportation Security to detect transport of illegal items. AUDREY is an AI capable of suggesting course of action to fire fighters in real-time, ensuring maximum efficiency in a safe manner.

AI in Education

[21][22][23] Over the years a lot of development has been made in the field of Artificial Intelligence so as to improve the education sector. These improvements have been proved to be beneficial to not only students but also teachers. In general, robotic and automated teaching systems have been introduced into the education system. These help in personalizing the teaching-learning process as well as reducing the instructors' workload through automated evaluation of students' answer sheets. Some of the software's like 'TurnItIn' and 'Ecree' are also able to check the originality of students' works.

[21][22] AI also forms the backbone of Natural Language Processing (NLP), which is the key factor behind the intelligent tutor systems. These systems are capable of personalizing learning. They are also capable of answering deep questions, create logical questions and develop self-reflection in the users. 'Cognitive Tutors' for mathematics and science and 'Auto Tutor' for physics, computers and learning critical reasoning are examples of such a system. 'Auto Tutor' is a dialogue-based intelligent tutor system.

[23] Nowadays, assistant robots called 'cobots' are being incorporated in the education sector to assist the teachers in teaching, especially kids. This assistance involves helping the kids learn their spellings and pronunciations. AI educational networks like 'Squeeze Net' and 'Mobile Net' can be accessed through smartphones. They are highly convenient and are capable of providing interactive and personalized learning.

Advantages of Artificial Intelligence

[24] AI technologies and applications can provide permanency. For example, in an organization some intelligence was developed by a group of people. Without the use of AI, this knowledge would be lost as in a few years or so the group of people may not be available to the organization. AI is capable of storing this knowledge permanently till the data is not disrupted.

It is also capable of improving on the data by learning from the real-world. This is called 'reinforcement learning'. It makes the knowledge or application more reliable, thus increase in its usage.

AI can also be cost efficient. They can minimize cost by reducing the staff and their working hours. AI is also capable of decision making by analyzing both quantitative and qualitative data. It is also able to take into account the real-life uncertainties.

The solutions or decisions made by AI are not only more reliable but also faster, as the AI is able to analyze data much faster than human mind. So complex problems can also be solved in a short amount of time.

[25] No matter how hard one tries, human decisions are never based on hard facts. Emotions always play a part in making decisions. On the other hand, AI is capable of making decisions solely based on facts.

Transfer of knowledge is much faster in an AI. It takes seconds to pass new knowledge gained by an AI to other machines, unlike when a person is needed to be trained in some field of knowledge.

Unlike humans AI systems do not get tired, thus increasing the number of hours worked. This is especially helpful in Manufacturing and Production sector.

[26] AI is able to solve even the complex problems easily and in a short amount of time. The probability of success is high as well. The calculations are prone to have less errors. Multiple problems can also be solved at the same time.

AI systems can be used to explore unexplored areas like deep oceans and space.

[11] Being precise and accurate, AI can be used for diagnosis of diseases or ailments. AI are capable of learning from successive cases. They are able to store and access vast amount of information in a matter of seconds. All these results in efficient diagnosis.

Using AI in healthcare in the form of monitoring system to keep an eye on the patients proves to be highly beneficial, as it reduces workload and allows the doctors to give more time to the critical patients. AI do not require rest thus they are able to monitor patients more efficiently than humans.

[27] Use of AI in education proves to be highly beneficial mainly due to the flexibility it offers. The students are able to choose their own course; they are able to decide the timings and place of learning depending on their situations. It also enables the student to access a varied variety of study materials.

During learning, using AI technologies most of the conversions, whether it be with the automated system or the teachers or other learners are through the mode of texting. This gives a chance to even the social anxiety prone students to clear their doubts and participate in discussions easily.

Learning using AI systems is also cost effective. It saves travel costs as well as costs of hiring academic staff and creation of school or college campuses. Problems due to shortage of teachers and professors is easily rectified by incorporating AI technologies.

[28] The major advantage of machine learning a sub-branch of AI is that it is able to analyze complex and large amounts of data in a short time. This is especially beneficial to the Manufacturing Industry where analyzing large amounts of data is extremely important.

AI systems are also capable of self-learning at least to some extent. This is advantageous when dealing with dynamic and complex data, as the norm in manufacturing industries.

Disadvantages or Challenges of Artificial Intelligence

[24][25] One of the major drawbacks of AI is that one can never be sure whether the AI program will reach to a definite and useful solution. Also, we are unable to see the internal intricacies that the program used, to reach the solution, i.e., AI is unable to explain the logic behind its solution. While solving a problem the mathematical way each step is clearly seen and can be separately analyzed unlike in the case of AI softwares. As AI cannot explain the reasoning behind a particular solution, one can never surely tell if the answers are even correct. This causes many problems.

[25] AI will soon start replacing humans in many fields, as AI technologies can perform the employees' job much more efficiently. This will result in mass-scale unemployment, leading to increase in crime and poverty. It can also severely affect mental health by causing anxiety, stress and depression in many.

[26][29][32]AI itself is not creative, all the creativity lies in the hands of the programmer. Thus, AI must be specifically programmed to complete certain creative tasks. Also, incorporation of AI in day-to-day life as part of smart phones or smart home devices makes the people lazy and increases the dependency on technology. This dependency on AI technology will lead to its excessive use, resulting in people getting addicted to it. This addiction can result in several health problems especially mental health problems. Its excessive use can result in loneliness, which in turn can cause increase in anxiety levels.

Also, we store our contacts and other private information on them, which in wrong hands, can lead to breach of privacy and other problems.

[27][31]Use of AI in education can be disadvantageous as well. Using AI technologies for learning requires immense concentration and motivation on the part of the learner. It is easier to get distracted during online learning as compared to classroom learning. Most communications are through texting thus, hampering a student's communication skills. It also limits firsthand experience, causing problems in learning some concepts which are better learned through hands on experience. AI solely relies on data provided, to create personalized learning programs for the students. If there is an anomaly in the data, or the data lacks knowledge regarding the obstacles experienced by minority students, it will hamper the learning process.

[30] Automated Banking System can be very disadvantageous. It can severely disrupt the day-to-day processes of the bank. It lacks the human touch, which can prove to be a hindrance, especially in the selling of various policies. Also, AI will not be able to make decisions in certain situations, that require a human's thought process. Fully automated banking system will lack supervision, thus requiring a higher number of safety protocols, lest chances of robbery or embezzlement increase.

[25][29] A failure in algorithm of AI especially in defense and healthcare sectors can lead to loss of multiple lives. Wrong diagnosis due to error in data fed to the AI can cause very severe problems. If fed wrong data by the enemy, AI in military system can cause disastrous effect. In the wrong hands, it can also lead to mass destruction.

[32] AI is advancing more rapidly in developed countries like USA and Japan as compared to developing countries. In the near future this may result in rifts between these countries. This can lead to a lot of fear and confusion along with many political problems.

Conclusion

Artificial Intelligence has already established its roots in various fields. More and more AI techniques are continuously being developed and researched on. Healthcare, education, transport and various other fields have evolved immensely. All of these advancements are aimed towards the betterment of human society.

From the data gathered we can say that Artificial Intelligence is a boonas well as a bane. In my opinion, its advantages outweigh its drawbacks. If judiciously used with proper rules and regulations AI can lead to a new era of technology. It has the capability to make human life easier and better. It also has the capacity to revolutionize various domains especially healthcare and education. By usage of AI, space exploration can reach new heights.

References

Alzaidi, A. A. (2018). Impact of artificial intelligence on performance of banking industry in Middle East. *International Journal of Computer Science and Network Security*, *18*(10), 140-148.

Amisha, P. M., Pathania, M., & Rathaur, V. K. (2019). Overview of artificial intelligence in medicine. Journal of family medicine and primary care, 8(7), 2328.

Arkorful, V., &Abaidoo, N. (2015). The role of e-learning, advantages and disadvantages of its adoption in higher education. *International Journal of Instructional Technology and Distance Learning*, *12*(1), 29-42.

Benko, A., & Lányi, C. S. (2009). History of artificial intelligence. In Encyclopedia of Information Science and Technology, Second Edition (pp. 1759-1762). IGI Global.

Briganti, G., & Le Moine, O. (2020). Artificial intelligence in medicine: today and tomorrow. Frontiers in medicine, 7, 27.

Charniak, E. (1985). *Introduction to artificial intelligence*. Pearson Education India.

Cheatham, B., Javanmardian, K., &Samandari, H. (2019). Confronting the risks of artificial intelligence. *McKinsey Quarterly*, 1-9.

Chen, H., & Wang, F. Y. (2005). Guest editors' introduction: Artificial intelligence for homeland security. IEEE intelligent systems, 20(5), 12-16.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

D'alfonso, S., Santesteban-Echarri, O., Rice, S., Wadley, G., Lederman, R., Miles, C., ... & Alvarez-Jimenez, M. (2017). Artificial intelligence-assisted online social therapy for youth mental health. *Frontiers in psychology*, *8*, 796.

Ertel, W. (2018). Introduction to artificial intelligence. Springer.

Fonseka, T. M., Bhat, V., & Kennedy, S. H. (2019). The utility of artificial intelligence in suicide risk prediction and the management of suicidal behaviors. *Australian & New Zealand Journal of Psychiatry*, *53*(10), 954-964.

Hamet, P., & Tremblay, J. (2017). Artificial intelligence in medicine. Metabolism, 69, S36-S40.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., &Scharre, P. (2018). Artificial intelligence and international security. Center for a New American Security..

Hwang, G. J., Xie, H., Wah, B. W., &Gašević, D. (2020). Vision, challenges, roles and research issues of Artificial Intelligence in Education.

Jones, M. T. (2008). Artificial intelligence: a systems approach. Laxmi Publications, Ltd..

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Lee, J., Singh, J., &Azamfar, M. (2019). Industrial artificial intelligence. arXiv preprint arXiv:1908.02150.

Liu, J., Kong, X., Xia, F., Bai, X., Wang, L., Qing, Q., & Lee, I. (2018). Artificial intelligence in the 21st century. *IEEE Access*, *6*, 34403-34421.

Luan, H., Geczy, P., Lai, H., Gobert, J., Yang, S. J., Ogata, H., ... & Tsai, C. C. (2020). Challenges and future directions of big data and artificial intelligence in education. *Frontiers in psychology*, *11*.

Malik, G., Tayal, D. K., & Vij, S. (2019). An analysis of the role of artificial intelligence in education and teaching. In *Recent Findings in Intelligent Computing Techniques* (pp. 407-417). Springer, Singapore.

McCorduck, P., &Cfe, C. (2004). *Machines who think: A personal inquiry into the history and prospects of artificial intelligence*. CRC Press.

Mohammadi, V., & Minaei, S. (2019). Artificial intelligence in the production process. In Engineering tools in the beverage industry (pp. 27-63). Woodhead Publishing.

Nilsson, N. J. (2009). The quest for artificial intelligence. Cambridge University Press.

Pan, Y. (2016). Heading toward artificial intelligence 2.0. Engineering, 2(4), 409-413.

Ramesh, A. N., Kambhampati, C., Monson, J. R., & Drew, P. J. (2004). Artificial intelligence in medicine. Annals of the Royal College of Surgeons of England, 86(5), 334.

Rouhiainen, L. (2018). *Artificial Intelligence: 101 things you must know today about our future*. Lasse Rouhiainen.

Rybski, P. E., Stoeter, S. A., Erickson, M. D., Gini, M., Hougen, D. F., &Papanikolopoulos, N. (2000, June). A team of robotic agents for surveillance. In Proceedings of the fourth international conference on autonomous agents (pp. 9-16).

Shih, W., & Srihari, K. (1995). Distributed artificial intelligence in manufacturing systems control. Computers & Industrial Engineering, 29(1-4), 199-203.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Wuest, T., Weimer, D., Irgens, C., & Thoben, K. D. (2016). Machine learning in manufacturing: advantages, challenges, and applications. *Production & Manufacturing Research*, *4*(1), 23-45.

EVOLUTION OF THE COSMOS

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Abstract
This document provides a brief discussion of the various theories and factors describing the evolution of the universe as a whole. We have discussed the various possibilities put forward by scientists concerning the formation of stars, galaxies, matter as well as the evolution of energy and extraterrestrial life. The document also throws light on the various problems we are facing today to answer some of the key questions about the evolution of the cosmos and how the unification of Physics can help us to solve these problems.
Keywords: big bang, big crunch, red-shift, wormholes, general relativity, gravity.

Introduction

The evolution of the universe – right from it's beginning, it's development and end – has been one of the most absorbing questions that human beings have thought of. We go about our daily activities, giving little thought to how the forces of nature work to give rise to sunrise and sunset, the lunar and solar eclipses, the changing of seasons, the formation of day and night and ultimately help to sustain our existence. Since the time, the earth-centric model was proposed by famous astronomers like Aristotle and Ptolemy, a number of theories have been proposed by several scientists for the beginning and end of the universe. In this paper, we wish to discuss some of those theories in detail.

The general theory of relativity together with quantum mechanics has been one of the most powerful tools to explain the mechanism of the evolution of the universe. Nevertheless, there are many discrepancies regarding the true nature of the universe as scientists still argue whether the universe did have a beginning or it existed all the time, whether it is static, chaotic, symmetrical or unsymmetrical, if it did have a beginning will it re-collapse again and what was there before the beginning of space and time, is it a universe or a multiverse that we live in and many more similar thought-provoking questions.

The answers to all these questions involve a thorough understanding of the nature of the infinitesimally small to the infinitely large. Recent breakthroughs in technology have given us valuable clues to answer these questions to some extent yet there is so much left to be discovered.

Another longstanding mystery is the presence of dark matter that occupies about 85% of the universe, along with the existence of black holes and gravitons. It is widely believed that all our misconceptions can be cleared and the mysteries can be unfolded if we are able to frame a complete unified theory of Physics that unifies all the fundamental forces of nature – the weak and the strong nuclear force, the electromagnetic force and the gravitational force. Out of these forces, the first three have been unified to form the Grand Unified Theory (G.U.T) whereas we have not been able to include gravity in it because the quantum theory of gravitons is not yet known.

The main difficulty of not being able to include gravity is that general relativity does not contain the main feature of quantum mechanics – the uncertainty principle. This makes the G.U.T unsatisfactory to explain the different phenomena of the universe. It may take us a long way to find a theory that unifies gravity with the other forces. Nevertheless, our deepest desire for knowledge is the sole justification for continuing this unending quest to completely understand the universe where we live.

The reason for selecting this topic is to discuss the advantages and drawbacks of the various scientific theories that have been proposed to explain the evolution of the universe, keeping in mind that none of these theories can be completely approved or totally rejected without any firm physical and experimental evidence. The paper also takes an in-depth study of the formation of stars and galaxies as well as the evolution of life in other parts of the universe. Besides, the paper aims to draw the attention of the readers to how space-time continuum gives us a better understanding of the universe and it sultimate fate.

Literary Survey

The beginning of the universe   [1]. Many physicists believe that the universe had gradually expanded from an intensely hot and dense point which is described in Fred Hoyle's famous Big Bang theory as the Big Bang singularity. Most of the energy in the universe is dominated by the presence of dark matter and dark energy while we have not been able to detect their presence experimentally, besides the various radiations and baryonic matter. Einstein had proposed a static and isotropic model of the universe and introduced the cosmological constant to solve his equations. However, his model turned out to be unstable.

Later Hubble proved that galaxies are moving apart, while some scientists have provided valuable data regarding galaxies moving faster than light's speed. As we look back in space and time, we notice a red-shift in the electromagnetic radiation wavelength and so we conclude from the Wien's Law that the temperature was very high at the early stage. It was found that during Big Bang, rapid nuclear reactions could take place only for a very short time. So this was a non-equilibrium process.

However, this theory of universe origin from a singularity is somewhat unjustified as no model to date has unified gravity with quantum mechanics. Observations show that most of the gravitational matter in the universe is weakly interacting which consists of the dark matter while dark energy act in opposition to it and cause the universe to accelerate. Besides, it has also been found out that a particle is found more commonly than the anti-particle. One explanation for this is high temperature during the grand unification.

A Cyclic Theory

[2].Scientists have also proposed a cyclic model of the universe where it begins with a big bang and again ends in a single point called the big crunch. From the beginning, we have arrived in a phase of accelerated expansion which dilutes entropy and density of the debris after the big bang. This acceleration then slowly ends and a period of de-acceleration follows it and finally a contracting phase and then the big-crunch. Thereafter, another phase will be resumed in a reversed sense, restoring the necessary conditions for a new big bang. Such a model had been approved by many scientists in the past.

But the theory received drawbacks after general relativity was proposed. Besides the problem of exactly defining the initial boundary conditions remain. It has been proposed that the universe is not closed but flat. The change from expansion to contraction is because of the negative potential energy and spatial curvature. In this way, the total entropy of the universe grows from cycle to cycle while the entropy density has a perfect cyclic behaviour as it gets created at each phase and gets diluted before the end of the phase.

Wormholes

[3].The existence of wormholes during the evolution of the universe is again a question of great interest. This idea was first put forth by Einstein and Rosen. According to the BIonic model, it is a channel for the flow of energy from the anti-universe-brane to the present universe and is responsible for the state of inflation.

After some time, it loses its energy, disappears and in this way the deceleration phase starts-off. As the separation decreases between the universe branes, tachyon (hypothetical particle moving faster than light) gets created. With decreasing separation, a second type wormhole called tachyonic wormholes are formed. In this way, we again get a connection between the two universe branes and the acceleration phase begins again.

Formation of Stars and Galaxies

[4].We know very little about the state of the universe around 10^6-10^9 years right after the big bang. It is assumed that the first stars to shine in the universe may have been formed out of un-magnetized pure hydrogen/helium gas, the reason being we find heavy elements in their interior.

[5].Star formation begins with dense regions of molecular clouds found in interstellar space. It is found that the longest-lived stars having low mass will run short of their hydrogen fuel, get transformed into white dwarfs and in this way within 10^{14} years, their temperature will become very low. On the other hand, stars having larger mass will require a shorter time to meet their end as a white dwarf or may turn into a black hole or a neutron star depending on their details of evolution.

It has also been studied that a planet gets detached from a star when it closely encounters with another star. The evolution of galaxies is rather a complicated process and scientists have not been able to understand it completely. A galaxy's central region may get collapsed to form a black hole along with evaporation of stars in its outer regions. These evaporated stars soon attain escape velocity and after about 10^{19} years get detached from the galaxy. It is not yet known how much matter of the galaxy finally collapses and how much escapes.

Due to accretion, different types of astrophysical sources bursts. By observing the radiations of X-rays in white dwarfs, we are able to study them in strong magnetic fields. Neutron stars, on the other hand, help us to study matter even under extreme density and magnetic field. The black hole binaries serve as a miniature model of super-massive black holes which are found at the centres of many galaxies and help us to study accretion.

[6].Observations show that certain stars provide us with valuable clues regarding the initial steps of the chemical evolution of our galaxy. In the early phase, we had only a few supernova sources and hence there was incomplete mixing of their ejecta. Besides, we find emission line being absent from dwarf galaxies whose metallic abundance is relatively less. The observed dispersion in abundance of various elements in blue compact galaxies arises because of chemical evolution of the first generation of stars.

Age of the Cosmos

[7].We can derive a new expression to find the age of our universe by taking an average of the deceleration parameter. Such a result holds in all aspects of cosmology. It is often argued by scientists that the decelerating stage must be compensated by the accelerating phase in order that the universe coasts forever. Therefore, this present stage of acceleration must be followed by a stage of deceleration.

[8].The uniform expansion of the universe was proved from the observation of red-shift in distant galaxies. The present properties of the universe can be explained in terms of its development from a state of high temperature and density. The study of various atomic elements provides valuable information regarding the changes in the universe. For example, on comparing the decay periods of radioactive isotopes like samarium-148 and thorium-232 that decay in several thousand millions of years, with potassium-40 and uranium-235, that decay in about hundred million years, we find that the former elements were more abundant than the latter ones. By comparing their relative abundances, we can try to get a rough estimate of our universe's age.

Evolution of Life

[9].It is one of the major interests of scientists to search for extraterrestrial life in the cosmos. For this, they need to study how planets develop and how the conditions for the evolution of life are achieved.

It is suggested that extraterrestrial organisms could have in other parts of the universe at the same time when our Earth saw the first signs of life. Thus liquid water may have also persisted on other planets and it is widely believed that Mars and Europa have habitable conditions even now.

[10].It has been found that the distribution of intelligent beings in a galaxy depends on the rate at which stars are formed there, the number of stars having a planetary system, the mean of the habitable planets within each system and various other factors.

Findings

We have seen that different scientists have different opinions regarding the evolution of stars, galaxies and the universe as a whole. However, the big bang model, the cyclic model together with the big crunch model still remain the most popular and widely accepted ones and the reason being they support a number of theoretical observations. Besides, the inflationary stage has also been supported by ample physical evidence.

The concept of wormholes, on the other hand, is a very debatable one as we don't have any physical evidence for them. Most scientists believe that it is just a hypothetical concept and can be ignored for most calculations in cosmology and astrophysics.

The study of different elements, especially the radioactive ones, together with the composition of dust particles, radiations from different stars and galaxies have been studied intensely as they help to find the age of the universe and its properties to a good level of accuracy. Besides, it is widely believed that life must evolve and extraterrestrial species must exist in those parts of the cosmos which satisfy the conditions of life, especially the presence of liquid water.

Recommendations and Conclusion

In spite of all the efforts of the modern technology to get a clear picture of the evolution of the universe as a whole, problems still remain and several questionsare yet to be solved.

The best way to unfold all the unfolded mysteries is to find a theory that unifies all the laws of Physics as mentioned earlier, in other words, to find a theory that unifies quantum mechanics and the force of gravity. While intense work is still going on to find such a theory, we hope that in the future or maybe several years later we frame such a theory or at least get a new ray of light in that direction.

As a whole we can conclude that though everything lies within the boundaries of the uncertainty principle, we may not be able to solve all the questions to a remarkable degree of accuracy as nature itself forbids us from doing so but just try to make certain assumptions and arrive at some logical conclusions from our experiments and observations.

References

Audouze, J., & Silk, J. (1995). The first generation of stars: first steps toward chemical evolution of galaxies. The Astrophysical Journal Letters, 451(2), L49.

Bromm, V., Coppi, P. S., & Larson, R. B. (1999). Forming the first stars in the universe: the fragmentation of primordial gas. *The Astrophysical Journal Letters*, *527*(1), L5.

Dyson, F. J. (1979). Time without end: Physics and biology in an open universe. *Reviews of Modern Physics*, *51*(3), 447.

Gamow, G. (1948). The evolution of the universe. Nature, 162(4122), 680.

Lima, J. A. S. (2007). Age of the Universe, Average Deceleration Parameter and Possible Implications for the End of Cosmology. arXiv preprint arXiv:0708.3414.

Marais, D. D., & Walter, M. R. (1999). Astrobiology: exploring the origins, evolution, and distribution of life in the universe. *Annual review of ecology and systematics*, *30*(1), 397-420.

Motch, C., Wilms, J., Barret, D., Becker, W., Bogdanov, S., Boirin, L., ... & Haberl, F. (2013). The Hot and Energetic Universe: End points of stellar evolution. *arXiv preprint arXiv:1306.2334*.

Ratra, B., & Vogeley, M. S. (2008). The beginning and evolution of the universe. *Publications of the Astronomical Society of the Pacific*, *120*(865), 235.

Setare, M. R., & Sepehri, A. (2015). Stability of cylindrical thin shell wormhole during the evolution of the universe from inflation to late time acceleration. Journal of High Energy Physics, 2015(3), 79.

Steinhardt, P. J., &Turok, N. (2002). Cosmic evolution in a cyclic universe. *Physical Review D*, *65*(12), 126003.

PARTS OF COMPUTERIZED REASONING

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What is AI?

[1] It is the science and engineering of making intelligent machines and computer programs that helps human life more efficient. It helps us to understand human intelligence. It do not undergo any method which are biologically observable. [2] Creation is arising as a product of human contrivance and ingenuity rather than as a result of natural especially biological or evolutionary influence. These are things that have a certain property through their intelligence as a result of a certain process they were created, designed, or manufactured in this way. AI is the human made memory power. AI very much updating in planning, reasoning, interpreting data, predicting outcomes. Mathematical methods are most commonly used in AI like Statistics and probability.

History of AI

[3] Intelligent behaviour of software when measured its efficiency is similar to human intelligence in the past. It helps us to understand human intelligence. When a human is unconfident whether the conversation of both when they are not besides them, will be in contact by viewing each of them faces. It do not undergo any method which are biologically observable. man-made reasoning in such manner has effectively been very productive in a few ventures like innovation, banking, advertising, and amusement. We've seen that regardless of whether calculations work on a lot, enormous information and gigantic figuring essentially permit computerized reasoning to learn through animal power. [4] The historical backdrop of man-made reasoning (computer based intelligence) started in ancient times, with fantasies, stories and gossipy titbits about counterfeit creatures supplied with insight or awareness by ace specialists. The seeds of current computer based intelligence were planted by traditional logicians who endeavoured to depict the course of human thinking as the mechanical control of images. This work finished in the innovation of the programmable advanced PC during the 1940s, a machine dependent on the theoretical pith of numerical thinking. This gadget and the thoughts behind it roused a small bunch of researchers to start genuinely talking about the chance of building an electronic cerebrum. Creation is the result of human creativity and invention rather than natural forces, such as biological or evolutionary influences. These are items that have a specific property due to their intelligence as a result of a specific method by which they were formed, constructed, or made.At past there is no idea to many people and some of them thought and they given by theoretical. Because of that some of the AI group has come from theoretical topractically true. Envisioning an extraordinary communitarian exertion, united top scientists from different fields for an open finished conversation on man-made brainpower.

Growth of AI

[5] There is rapid growth in buying products. It is mostly needed and become common to have with people nowadays. Artificial intelligence helps industrialist to prepare more products in less time. Utilizing AI and PC vision for identification and grouping of different "security occasions," the shoebox-sized gadget doesn't see all, yet it sees bounty. Like what direction the driver is looking as

he works the vehicle, how quick he's driving, where he's driving, areas of individuals around him and how other forklift administrators are moving their vehicles. IFM's product consequently distinguishes security infringement (for instance, wireless use) and informs stockroom supervisors so they can make a quick move. The fundamental objectives are to forestall mishaps and increment effectiveness. The simple information that one of IFM's gadgets is watching, Gyongyosi claims, has had "a tremendous impact."Artificial intelligence have positive and negative impact. Growth of AI is because of laziness in people, But because of AI we can know many things regarding studies, places what people do and many more. [6] **Transportation :** Although it could take a decade or more to perfect them, autonomous cars will one day ferry us from one place to place. **Manufacturing :** intelligence controlled robots work close by people to play out a restricted scope of assignments like gathering and stacking, and prescient investigation sensors keep hardware moving along as planned. **Media :** Reporting is tackling computer based intelligence, as well, and will keep on profiting from it. Bloomberg utilizes Cyborg innovation to assist make with fast detecting of intricate monetary reports. The Related Press utilizes the normal language capacities of Mechanized Bits of knowledge to deliver 3,700 acquiring reports stories each yearalmost multiple times more than in the new past. **Customer Service :**Last however scarcely least, Google is chipping away at an artificial intelligence associate that can put human-like calls to make arrangements at, say, your local boutique. Notwithstanding words, the framework gets setting and subtlety. However, those advances (and various others, including this yield of new ones) are just the start, there's something else to come all the more besides anybody, even the most judicious prognosticators, can comprehend.

AI in Healthcare Appliances

[7] The use of artificial intelligence in healthcare has the potential to assist healthcare providers in many aspects of patient care and administrative processes. Artificial intelligence in healthcare suggest that the use of artificial intelligence in healthcare can perform just as well or better than humans at certain procedures, such as diagnosing disease, it will be a significant number of years before AI in healthcare replaces humans for a broad range of medical tasks. [8] Artificial intelligence has existed for decades and continues to evolve as technology advances. In health care, AI can be used to simplify the check-in process for patients, make patient records more efficient, monitor disease, aid diagnosis, assist in surgical procedures, and offer mental health therapy. In radiology, AI assists in multiple processes including scheduling patients, billing, optimizing staffing, creating protocols, assessing image quality, reducing radiation dose, and image interpretation. AI is not something to be feared, as it will not replace humans; rather, it should be embraced for its ability to improve and prolong lives. Artificial intelligence has also help doctors, nurses to reduce their mental pressure and helps to do high risk jobs related to patients. It also help staff to take decision more precisely and accurate. There is growth in artificial intelligence in field of healthcare. [9]**AI-assisted robotic surgery:** As far as training, AI can help work on careful execution, despite the fact that it is as yet in its outset. Commonly, the result of a medical procedure, particularly one that is new or refined, is reliant upon the specialist's capacity. Computer based intelligence can help even the most talented specialists increment their usefulness by decreasing case-to-case fluctuations. Simulated intelligence controlled robots, for instance, can empower three-dimensional amplification for enunciation while likewise performing with more noteworthy accuracy and scaling down. Essential accuracy cutting and sewing can be performed by AI-empowered robots. At the Maastricht

University Medical Center in the Netherlands, we saw specialists utilizing AI helped mechanical technology to join tiny blood conduits running from.03 to.08 mm in measurement. The specialist, obviously, still has command over the mechanical stitching. During a careful cycle, there are a few little troublesome positions that require the mastery of a talented specialist. We actually have far to go before we can see it. **Accuracy medication:** Accuracy medication, which is being hailed as the outlook changing medical care practice, is one of the most significant instances of computerized reasoning in medical services. Accuracy medication is based on gigantic volumes of information gathered from an assortment of problematic specialized developments, including as quiet worn wellbeing sensors, minimal expense genomic sequencing, and progressed biotechnology. Accuracy medication is characterized as "fitting clinical treatment to every understanding's exceptional qualities." Medical practices are quickly getting away from settling on choices dependent on a couple of apparently divided attributes between patients and toward a more individualized methodology. Accuracy medication depends on current supercomputing calculations with profound realizing, which puts doctors' intellectual abilities to another level. One of the difficulties nowadays of simple admittance to genomic information is filtering through it to find hereditary variations that raise ailment hazard. Intel, in organization with the Scripps Research Institute in California, has fostered another innovation. **Drug revelation:** Clinical preliminaries in their flow design require many years of exploration and cost billions of dollars. "Just five out of each 5,000 drugs that start preclinical testing at any point come to human testing, and just one of these five is at any point endorsed for human use," as per the California Biomedical Research Association. The use of man-made reasoning (AI) in drug examination can assist drug organizations with smoothing out medicine disclosure and repurposing. Pfizer, Sanofi, and Genetech, for instance, are currently helping out AI specialist co-ops IBM Watson, Exscientia's man-made reasoning, and GNS Healthcare, to drive their oncology drug disclosure projects. Artificial intelligence can pinpoint already obscure reasons for some afflictions, just as consider more exact and repeatable testing of more synthetics. Utilizing AI for drug disclosure would permit us to forsake the old experimentation approach for a more quiet determined science by fusing more information inferred data.

AI in Manufacturing and Production

[10] Artificial intelligence quality of the product has increased. It also provided with cost-effective and eco-friendly. This results in high competition of manufacturing enterprise or group in market. Shockingly, many organizations come up short on the assets to make an interpretation of this data to decrease expenses and increment productivity. For that, organizations need Computerized reasoning.[11]Three artificial neural network algorithms are proposed and embedded in a two-stage model to support the dynamic allocation of digital designs to different additive manufacturing techniques. There is much excitement regarding the potential for AI in semiconductor manufacturing. Recognize abandons all through the creation interaction. Convey prescient support to lessen vacation. React to continuous changes sought after across the store network. Approve whether mind boggling products like central processor have been flawlessly created. Diminish expenses of little cluster or single-run products, empowering more prominent customization. Further develop representative fulfilment by moving unremarkable undertakings to machines. [12]The world are investing heavily in digital transformation in an effort to provide healthier ecosystems for people. At homes being equipped with smart devices example smart meters, sensors, and so on, which generate massive volumes of fine-grained and indexical data that can be analyse.For an

enormous gathering of enterprises like gaming, banking, retail, business, and government, and so forth Man-made intelligence is broadly utilized and is gradually looming in the assembling area, working with the modern Computerization. Simulated intelligence driven machines are laying a more straightforward way to the future by yielding a lot of advantages – offering new freedoms, upgrading creation efficiencies, and bringing machine association nearer to human collaboration. The Fourth Modern Upheaval is information based work, done by the computerization; by making better approaches to robotize errands, we can reconstruct the way individuals and machines live, connect and team up, to make a prevalent, more grounded advanced economy.

AI in Security and Surveillance

[13] The role of AI in threat landscape has great impact for information security. They can steal from bots, and related systems similar to cyber attacks. So AI has some mechanisms to safe guard their data. There are countless attacks unsophisticated programmers, so-called "script kiddies," who are not skilled enough to develop their own cyber-attack programs but can effectively mix, match, and execute code developed by others. AI is there for to prevent attacks or crime. [14] AI plays key role in CCTV cameras or phone cameras. These uses to capture the witness and also for security purpose before entering into banks or temples or assembly there will be metal detectors to safe guard before itself. Underside vehicle bomb detection. Infectious disease detection. Home security. Threat screening for large events. Crime prevention cameras. Military reconnaissance.Border control lie detector. Offshore Oil & gas threat detection. Machine-based learning and calculations are utilized in AI for video reconnaissance and security to screen and examine the pictures, recordings, and information caught by video observation cameras. It can likewise perceive and investigate the development of individuals, autos, and an assortment of different items.Simulated intelligence can utilize machine vision to group put away information and convey cautions when the framework doesn't perceive the individual, demonstrating intruding. The AI programming can possibly keep up with track of the reconnaissance of a huge number of cameras, moving and outliving our human capacity to do as such. The limit of AI to distinguish dangers before they happen is significantly more charming. Computer based intelligence can distinguish even the smallest deviations in an organization's customary action and stay away from potential attacks utilizing calculations and profound learning. [15] AI is also use in military purposes Thereis robotics and autonomous system for which works for difficulties with no risk. By this we can see others strength level. While a security official may miss an individual slipping into a dim office, a camera supported with savvy video investigation is intended to get a glimmer on the screen and remember it as a possible danger. Or then again it will detect an individual dallying at the border of a schoolyard and alarm on-the-ground security authorities to examine and make a move if fundamental, all without thinking twice and keeping close watch on the numerous cameras and locations.

AI in Education

[16]Schools are where much learning happens in friendly and collective settings. AIED assists educators with showing down to earth or specialized things to understudies so that straightforward of all ideas. AIED right now assists with taking in anything from the web and so on, whenever. In light of computer based intelligence individuals are looking into intrigued things and finding more in separate fields and giving them more information.[17] Different advances made to get simpler for students and the fine climate for educators to show the understudies. E-picking up becoming

significant part now a days. Where there is no need of instructors. Current framework information there is nonstop advancement of artificial intelligence. Understudies could get extra help from Artificial intelligence guides. It is changing how we find and collaborate with data. Educators invest a great deal of energy on regulatory errands like reviewing and surveying worksheets. The utilization of computerized reasoning (AI) in training can help with the mechanized reviewing and appraisal of assignments like numerous decision questions, fill-in-the-spaces, and other comparative exercises. Planning understudy report cards is one more terrible and tedious errand for educators. Man-made reasoning in schooling may likewise have the option to help with this. Regulatory undertakings can be computerized, permitting educators to invest more energy with students and further developing the learning experience.[18] The exchange of explicit information to understudies and the development of important capacities through particular information were focused on in the instructive framework. In light of the framework information which animates in human rationales. Simulated intelligence in schooling are reciprocal to one another. Artificial intelligence can drive proficiency, personalization and smooth out administrator errands to permit educators the time and opportunity to give comprehension and versatilityremarkably human capacities where machines would battle. By utilizing the best assign of machines and instructors, the vision for artificial intelligence in schooling is one where they cooperate for the best result for understudies. Since the understudies of today should work in a future where artificial intelligence is the truth, it's significant that our instructive establishments open understudies to and utilize the innovation.

Advantages of AI

[19] Artificial intelligence use for people for taking care of an issue. It is a lot of utilized in data security. Simulated intelligence utilized in military purposes to know the rival power and the number of individuals are there. It is additionally utilized in getting of lawbreakers by cc cameras in any part they are moving. [20] Man-made intelligence procedures like fluffy master frameworks, Bayesian organizations, counterfeit neural organizations, and crossover savvy frameworks were utilized in various clinical settings in medical care. Electronic wellbeing record frameworks to neural organization based direction in treatment. Robots helping with doing medical procedures, canny prostheses for impeded individuals, and older consideration. PCs being at first utilized in clinical imaging for managerial work like picture procurement and capacity to now turning into a basic part of the workplace with the beginning of picture filing and correspondence framework. [21] The plan thought is basic. The customary traditional regulator regularly needs to configuration as indicated by the controlled item model, however the model development will normally have numerous dubious elements, for example, changing of boundaries and the mathematical kind, so that to make the plan more troublesome. Computerized reasoning control is easy, and the man-made intelligence work approximator doesn't have to control the model of the article. Execution improvement. By appropriately changing related boundaries, execution can be improved rapidly. For instance, the fluffy rationale regulator responds quicker than the ideal PID regulator, and the overshoot is more modest. More advantageous to utilize. The man-made consciousness regulator is simpler to change than the old style regulator, and is more versatile to new information or new data. Great consistency. The conventional control calculation is planned by the particular item, so the control impact is awesome just for the particular article, however the impact of other control items won't be reliable. The man-made reasoning control calculation, regardless of whether for the predefined or obscure information, can get great consistency assessment. [22] Digital frameworks

are profoundly helpless against interruptions and different dangers. Physical or some other human mediation isn't feasible for these digital assaults. There ought to be a solid guard framework in any potential ways it ought not spill. Network protection group continually following all assailants. [23] Artificial intelligence is exceptionally valuable in modern reason it diminishes the work for individuals and expanding in assembling and accessible to each individual. It additionally has monetary advantages. Better client care. Better quality and decrease of human blunder.

Challenges or Dis-advantages of AI

[24] Since AI is developing consistently, equipment and programming should be updated consistently to stay aware of the most recent necessities. Machines require fix and support, the two of which cause critical uses. Since they are incredibly convoluted hardware, their development requires extravagant costs. [25] There are challenges in Data privacy and security, Bias problem, limited knowledge, Trust deficit, Computing Power. Nonetheless, as computer based intelligence innovation advances and arrangements are grown, more factors additionally seem concerning how we get things done and if the current assets will get the job done to take into account the steadily changing necessities of individuals. Subsequently, alongside the inexplicable issues, challenges appear to be ceaseless and we're not even close to enough in idealizing our frameworks. To overcome this processing unstructed data, improving cyber security etc.,. [26] Negative impacts of AI are loss of certain jobs, Accelerated Hacking , AI terrorism etc.,. because of this the people are making money with hacking bank accounts, passwords of personal website and also every data in phones are getting leaked. [27] **AI-enabled machines incur heavy costs :** Checking out the intricacy an artificial intelligence empowered machine handles, it's a good idea that simulated intelligence driven drives can be weighty on pockets. Making a machine that can copy human rationale and thinking requires a lot of assets and time, making it very expensive. **Machines lack creativity :**The issue with machines is that it capacities as customized. While computerized reasoning has made machines equipped for learning over the long haul, they can't figure out how to break new ground. A machine will consistently dissect a circumstance as far as pre-taken care of information and previous encounters. It is hard for a machine to be innovative in its methodology**.** The issue with this bot-composed article is that it does not have the human touch, dissimilar to other Forbes articles. The imaginative touch to clarifying occasions and use cases while composing an article is absent when a machine does it. **No emotions can beintimidating at times :**Machines can't bond with people, since they don't have feelings or compassion. While AI and NLP has assisted brands with setting up beginning client care through bot-empowered talk frameworks, they actually require a human of blood and tissue to intercede at one highlight settle a continuous issue. If its entire is passed on to bots, client experience across the globe will go downhill. Bots can do the underlying touch basing. If clients question is settled through pre-taken care of guide archives, fantastic. If not, a ticket is consequently raised by the bot for a human to physically follow up. Now and again, a bot can't comprehend your trouble spot since you don't sincerely drive it. You will consistently require a human ear to finish thing. [28] Independent weapons(AI) are consciousness frameworks that are customized to kill. In the possession of some unacceptable individual, these weapons could without much of a stretch reason mass setbacks. Additionally, an artificial intelligence weapons contest could accidentally prompt a man-made intelligence war that likewise brings about mass losses. To try not to be ruined by the adversary, these weapons would be intended to be very hard to just "turn off," so people could conceivably fail to keep a grip on such a

circumstance. This danger is one that is available even with tight simulated intelligence, yet develops as levels of artificial intelligence insight and independence increment. The computer based intelligence is customized to accomplish something valuable, yet it fosters a ruinous strategy for accomplishing its objective: This can happen at whatever point we neglect to completely adjust the man-made intelligence's objectives to our own, which is strikingly troublesome. In the event that you ask a dutiful smart vehicle to accept you to the air terminal as quick as could really be expected, it may get you there pursued by helicopters and canvassed in upchuck, doing not what you needed but rather in a real sense what you requested. In the event that a hyper-genius framework is entrusted with an aspiring geo engineering project, it may unleash ruin with our environment as an aftereffect, and view human endeavours to stop it as a danger to be met.

Conclusion

Artificial consciousness and innovation are two aspects of life that continue to fascinate and astonish us with unique ideas, perspectives, improvements, and products. Simulated intelligence is still not as well-developed as the movies that deal with it (e.g., smart robots), but there are countless substantial attempts to get to the level and compete in the market, such as the robots that are occasionally shown on television. In any case, covert endeavours and advancement in current businesses. Towards the end, I've been going over the definitions of computer based intelligence, a brief history, open applications of man-made intelligence, military uses of man-made intelligence, computer based intelligence morals, and the three advanced mechanics standards. This isn't the end of computer-based intelligence; there's more to come, and no one knows for sure how the computer-based intelligence will evolve.

References

Aghion, P., Jones, B. F., & Jones, C. I. (2019). 9. Artificial Intelligence and Economic Growth (pp. 237-290). University of Chicago Press.

Allam, Z., & Dhunny, Z. A. (2019). On big data, artificial intelligence and smart cities. Cities, 89, 80-91.

Amisha, P. M., Pathania, M., & Rathaur, V. K. (2019). Overview of artificial intelligence in medicine. Journal of family medicine and primary care, 8(7), 2328.

Becerra-Fernandez, I. (2000). The role of artificial intelligence technologies in the implementation of people-finder knowledge management systems. Knowledge-Based Systems, 13(5), 315-320.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. Ai Magazine, 26(4), 53-53.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Cohen, P. R., & Feigenbaum, E. A. (Eds.). (2014). The Handbook of Artificial Intelligence: Volume 3 (Vol. 3). Butterworth-Heinemann.

Dilek, S., Çakır, H., & Aydın, M. (2015). Applications of artificial intelligence techniques to combating cyber crimes: A review. arXiv preprint arXiv:1502.03552.

Eldrandaly, K. A., Abdel-Basset, M., & Abdel-Fatah, L. (2019). PTZ-surveillance coverage based on artificial intelligence for smart cities. International Journal of Information Management, 49, 520-532.

Feng, H. (2018, September). The application of artificial intelligence in electrical automation control. In Journal of Physics: Conference Series (Vol. 1087, No. 6, p. 062008). IOP Publishing.

Guo, M. Advantages And Disadvantages Of Artificial Intelligence In Business English Teaching.[28] Makridakis, S. (2017). The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms. Futures, 90, 46-60.

Han, L. (2018). Analysis of new advances in the application of artificial intelligence to education. Advances in Social Science, Education and Humanities Research, (220), 608-611.

Helbing, D. (2019). Societal, economic, ethical and legal challenges of the digital revolution: from big data to deep learning, artificial intelligence, and manipulative technologies. In Towards digital enlightenment (pp. 47-72). Springer, Cham.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., & Scharre, P. (2018). Artificial intelligence and international security. Center for a New American Security.

Jones, M. T. (2008). Artificial intelligence: a systems approach. Laxmi Publications, Ltd.

Lee, J., Singh, J., & Azamfar, M. (2019). Industrial artificial intelligence. arXiv preprint arXiv:1908.02150.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. Frontiers of Information Technology & Electronic Engineering, 18(1), 86-96.

Lu, H., Li, Y., Chen, M., Kim, H., & Serikawa, S. (2018). Brain intelligence: go beyond artificial intelligence. Mobile Networks and Applications, 23(2), 368-375.

McCarthy, J. (1998). What is artificial intelligence?.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Nagao, K. (2019). Artificial intelligence in education. In Artificial intelligence accelerates human learning (pp. 1-17). Springer, Singapore.

Nilsson, N. J. (2009). The quest for artificial intelligence. Cambridge University Press.

Rich, E., & Knight, K. (1991). Artificial intelligence.

Timms, M. J. (2016). Letting artificial intelligence in education out of the box: educational cobots and smart classrooms. International Journal of Artificial Intelligence in Education, 26(2), 701-712.

Wagner, J. B. (2019). Artificial intelligence in medical imaging. Radiologic technology, 90(5), 489-501.

Yassine, A., Singh, S., & Alamri, A. (2017). Mining human activity patterns from smart home big data for health care applications. IEEE Access, 5, 13131-13141.

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. Materials Horizons, 2(2), 140-156

ADVANCEMENT OF COOLING TECHNOLOGY IN BATTERIES OF ELECTRIC VEHICLES

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Abstract

Due to the continuous usage of gasoline vehicles environment is continuously getting polluted due to which an eco-friendly technology was needed. This led to the invention of electric vehicles. Later it was found out that electric vehicles also faced problem due to heating of batteries which led to the decrease efficiency of the batteries. In warm countries some advanced cooling technology must be introduced so as to overcome heating of batteries. The optimum temperature for batteries is about 25 degree centigrade but due to some internal heating it is difficult to maintain this temperature and due to this various organisations started working for finding an advanced cooling technology so as to increase the efficiency of the batteries and to promote the electric vehicles. Here in this paper some of the current cooling technologies have been discussed along with the comparison with the previous technologies. The preheating of the batteries is also required for starting the electric vehicle and for this sum heat and technologies are the required which are also discuss and this discussion state of charge (SOC) and the health of the batteries should also be maintained in order to increase the life of the battery. For increasing the life of the batteries we have also discuss some technologies in the following pages.

Keywords: electric vehicle, thermal management, heat pipes, cooling of batteries, temperature

Introduction

In the last few decades we have seen that there has been a major problem in environmental degradation. The major cause for the degradation is the pollution cause by the automotive vehicles. This arises the need for some environmental friendly technology in automotive industries. This leads to the invention of electric vehicles. Electric vehicles has become the fastest growing innovations in the automobile industries. Vehicle which do not pollute the environment shows a very promising sign for future development in the industries. Electric vehicles is still at a very prepubescent stage. Lots of research are done to make it more advanced.

Electric vehicles mainly work on lithium batteries. This type of batteries works most efficiently at 25 degree centigrade. In tropical countries like India UAE Malaysia etc average temperature is about 32-40 degree centigrade. Due to high temperature the batteries get heated up which leads to wastage of energy. The internal resistance of batteries will rise sharply when the operating temperature is lower than zero degree centigrade, which can greatly influence the performance of the batteries.

In the current period Passive air cooling is used in electric vehicles for Battery Thermal Management System (BTMS). During charging of battery it will not cool down because cooling of battery is mostly depends upon movement of electric vehicles. That is why, heating of battery led to the decrement in charging time of battery. In tropical countries active cooling system is much more required as heat cannot be transferred easily as in colder region

Literary Survey

[1] Electric and hybrid vehicle's performance and life cycle cost depends totally on batteries which are an energy storage system.

All electric range, power of acceleration, fuel economy and acceptance of charge is directly affected or depends mainly on battery pack installed. Important factors for obtaining a good amount of performance in battery is temperature and uniformity in temperature. Packs installed in modules have to be operated within certain temperature range which is suitable for electrochemical pair. Further this modules should run under uniform temperature, since uneven temperature distribution in packs may affect the charging /discharging behaviour which could lead to unbalance in electric modules and reduce the efficiency of the pack. There has been a need to achieve the desired performance or efficiency in packs which could be brought up by Battery Thermal Management System (BTMS) which could work in any climatic conditions.[2] For starting the Hybrid electric vehicles (HEV) battery preheating is required which is difficult in colder regions and battery preheating can be done by passing fluid which is not very effective due to sluggish during cold temperature. Energy and heat are transferred by passing electricity, heating by electric heaters by hot fluid. testing two batteries lead acid and NiMH batteries AC heating is found to be more effective in preheating the main motive of the BTMS is to increase the efficiency of batteries in HEVs and still test on temperature, SOC state of charge, currents are still going on.[3] For efficient working of batteries optimum temperature is required. For cooling several methods like passive cooling means outside air passage, passive heating and cooling means cabin air passage, active heating by outside, method by liquid includes direct contact of liquid, moderate cooling through liquid circulation, active cooling and heating. Air cooling is less complicated than liquid cooling but even less effective than liquid cooling and NiMH batteries has complicated BTMS(battery thermal management system) than Lithium ion and VRL a batteries. In active vs passive system, active components like evaporation, engine coolants heating core are preferred.[4] The enlarging market of electric vehicles calls for highly specific power and highly specific energy density batteries for the proper ignition of the electric vehicle. The staging of electric vehicle is directly proportional to the staging of electric batteries. For efficient cooling and thermal management many industries widely use heat pipes also called as "super thermal conductors". A conclusion is made at the end that heat pipes are successfully used to cool a battery with a negligible rate of heat generation. An appropriate heat pipe can control the temperature and the temperature difference of power batteries in a specific range. Power batteries thermal management necessarily needs heat pipes to show a positive signs for the desired cycle performance. One of the major factor is the temperature rise, which must be taken into consideration first, for the design of power battery thermal management system which could be achieved by installing well designed heat pipes. [5] For adopting eco-friendly technology electric vehicles come in role in the main problem in electric vehicles is detection of efficient battery, for that state of charge (SOC) of batteries means health of batteries must be good and for (SOC) three things must be monitored, firstly cell voltage monitoring which means charging of batteries should be stopped is voltage is above 4. 2 volts and discharging should be stopped is voltage of cell becomes below 2. 7 volt threshold. Secondly, cell equalization means for having higher energy storage capacity and for that switched register technology should be introduced and lastly, battery management which means monitoring for state of charge and good health of the battery should be monitored.[6] Electric and hybrid electric vehicle's core energy sources are battery, their staging greatly impacts the stability of vehicles. Manufacturers are seeking for the improvement in the battery technology and battery management systems. Due to various environmental degradation of battery, it may vary, chemical reactions in battery are subject to ignition condition. In research and

commercial products battery management system framework was proposed to deal with the deficiency of current battery management systems. Therefore different ways should be applied to improve and optimize the performance of battery management systems in future electric and hybrid electric vehicles.

[7] Liquid cooled plate heat exchanger is required to improve the state of charge of battery and health of battery in electric vehicles. The battery of electric vehicle undergoes various problem like premature aging because of continuous heating of battery at the time of charging and discharging. For understanding the temperature distribution of battery, computational fluid dynamics (CFD) is used. Water is used as heat transfer fluid when different amount of water is passed with different flow rate. The surface temperature is maintained which is required for self-operation of battery by heat exchanger plates.[8] The battery in electric vehicles consists of module of cells and due to the high temperature and inappropriate voltage lead to imbalance and can decrease the performance of pack by 25%. Battery management system (BMS) provides voltage measurement, equalization and management of charge. Battery packs can be controlled by the software which can balance the cell and equalise the battery. Modularization can avoid wiring harness and can reduce the number of modulus and even cost of modularization also increase energy density which leads to high energy storage capacity of batteries.[9] For personal transportation electric vehicles were accepted by most of the researchers in place of vehicles which consume primary energy. Conventional vehicles are less efficient in terms of energy than electric vehicles. Conventional vehicles work at 18% efficiency whereas electric vehicles are operated at 46% efficiency. Zero vehicular emissions are produced by electric vehicles. However, when the source fuel is converted into electrical power, emissions are produced at the generation site. The emission of electric cars therefore depends on the emission profile of regional generating plants. [10] SLI Lead-Acid batteries life cycle has a linear relationship with temperature i.e. when life cycle of battery decreases, temperature increases. Similarly, the charge efficiency increases linearly. Thermal control is necessary at near ambient temperature for battery systems. As the temperature dropped the rate of charge acceptance also dropped suddenly. Several lead acid EV battery pack's performance and life are dependent on temperature gradient. Subsequently it was found that temperature gradient between modules reduces overall pack capacity. The temperature distribution for maintaining the pack is 35 degree to 40 degree centigrade for lead acid batteries that are used presently.

Findings

For starting an electric vehicle preheating of battery is required which can be done by sparking and passing fluid through it. But afterwards cooling of batteries is must so as to keep the efficiency of battery balanced. So cooling outside air passage, passive heating and cooling, cooling by liquid, cooling by ventilation, engine coolants can be used. State of charge and health of battery can be maintained by maintaining voltage across the battery during charging and discharging. Most of the research is carried on Lithium ion and NiMH batteries. It is necessary to keep temperature uniform since temperature plays an important role. There is a need to keep optimum temperature so as to keep the performance of the battery module. Uneven temperature may affect charging and discharging behaviour of the battery which could make an impact on performance of batteries. Heat pipes are used for uniformity of temperature in batteries. The main source of energy on EVs and HEVs are batteries and therefore the performance of EVs and HEVs is greatly influenced by stability of vehicle. Battery Thermal Management System (BTMS) is a way in which we could keep a control over all the problem listed above.

Recommendation & Conclusion

After the invention of Eco Friendly Technology as electric vehicles various problems also associated with the usage of HEVs. The major problem was related to battery and the problems were preheating of batteries, cooling of batteries and state of charge of batteries by the continuous efforts in research various technologies emerged which can resolve the above problems to some extent and the major outcomes were passive cooling of batteries. Battery Thermal Management System is a way we can ensure that the performance of batteries in EVs and HEVs is efficiently working. Conventional Vehicles are less efficient in term of energy and performance in batteries whereas Electric Vehicles have high efficient battery with good performance which will keep the EVs and HEVs stable .Also there is a need to maintain temperature gradient or make temperature uniform so that battery does not change its behaviour while charging or discharging.

References

Affanni, A., Bellini, A., Franceschini, G., Guglielmi, P., & Tassoni, C. (2005). Battery choice and management for new-generation electric vehicles. IEEE Transactions on Industrial Electronics, 52(5), 1343-1349.

Maskey, M. (1999). Battery management system for HEV (Doctoral dissertation, Texas Tech University).

Pesaran, A. A. (2001). Battery thermal management in EV and HEVs: issues and solutions. Battery Man, 43(5), 34-49.

Pesaran, A. A., Burch, S., & Keyser, M. (1999). An approach for designing thermal management systems for electric and hybrid vehicle battery packs. 4th Vehicle Thermal Management Systems, 24-27.

Pesaran, A. A., Vlahinos, A., & Burch, S. D. (1997). Thermal performance of EV and HEV battery modules and packs. National Renewable Energy Laboratory.

Pesaran, A., Vlahinos, A., & Stuart, T. (2003, March). Cooling and preheating of batteries in hybrid electric vehicles. In *6th ASME-JSME Thermal Engineering Joint Conference* (pp. 1-7).

Rahman, M. M., Rahman, H. Y., Mahlia, T. M. I., & Sheng, J. L. Y. (2016, March). Liquid cooled plate heat exchanger for battery cooling of an electric vehicle (EV). In IOP Conference Series: Earth and Environmental Science (Vol. 32, No. 1, p. 012053). IOP Publishing.

Rao, Z., Wang, S., Wu, M., Lin, Z., & Li, F. (2013). Experimental investigation on thermal management of electric vehicle battery with heat pipe. Energy Conversion and Management, 65, 92-97.

Stuart, T., Fang, F., Wang, X., Ashtiani, C., &Pesaran, A. (2002). A modular battery management system for HEVs (No. 2002-01-1918). SAE Technical Paper.

Xing, Y., Ma, E. W., Tsui, K. L., &Pecht, M. (2011). Battery management systems in electric and hybrid vehicles. Energies, 4(11), 1840-1857.

ARTIFICIAL INTELLIGENCE- AN AUTOMATED CREATION

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What is Artificial Intelligence?

[1] Artificial Intelligence is a study of Engineering Science that deals in making smart Machines and Computer based programmes. It works by using the computers to understand the human Intelligence, but AI is not only limited to biological methods, it is a part in various platforms and fields.[2] AI is explained as an intelligence displayed by an artificial system to resolve complex problems and such a system is normally supposed to be a computer or a machine. Artificial Intelligence is a combination of computer science and physiology of Intelligence, which can be simply stated as an algorithmic and computerised part of advantage to the today's world.[3]We can create machines which can behave like a human, think like humans, and able to make decisions individually through AI mechanism. The two words Artificial Intelligence commonly means the intelligence made by humans. The field of Artificial Intelligence was formed with an idea that one day the intelligent machines created will be able to match the human intelligence and consciousness. AI is not only evolving in the research sector but also in the modernization of Industries and work as we currently understand. Ai goes through various phases of planning, reasoning, analysing data, prediction of outcomes and acting in accordance. Statistics, Probability and various other mathematical approaches are used in AI for Neural Networks and Machine Learning.

History of Artificial Intelligence?

[4] Artificial Intelligence was first introduced and detailed in 1950, but due to many limitations in the earlier models prevented it from global acceptance and application which overcame by the development of careful research and deep learning.[5]After 1956, Artificial Intelligence researchers began out to identify the standard methodologies that characterised intelligent human behaviour and cognitive abilities in medical diagnosis, playing chess, language understanding in speech processing and other areas in the aim of being able to automate the processes. However, primarily, Artificial Intelligence today, mainly approaches this symbolic method only for the name. Over the course of twentieth century, major part of the foundational commitments and methodologies were forgotten. Human's Intelligence was perhaps most prominently, the primary example upon which early automation mechanism techniques were based. The main goal was to replicate intelligent human behaviour and cognitive abilities into robots and machines by understanding the mechanisms that take place in our own intellect so that they could be automated. However today, most of the researchers want to design and create autonomous systems that can handle well in complex application domains by any possible means instead of using human-like means (Floridi, 2016). In fact, many strong methodologies today intentionally eliminate human activity such as automated game leagues that create remarkable strategies totally by playing only against oneself and keeping a record of moves that are most likely leading to a win, rather than using human inspired techniques or training to play with human operators (Pollack & Blair, 1997; Tesauro, 1995).Machine Learning is said to be today's most powerful and profitable, artificial intelligences created. It exhibits relatively a limited range of intelligent behaviour. Machine Learning algorithms are mostly designed to

perform one task to generate accurate predictions. There is no clear narration of artificial intelligence from the 1950s to the present day.[6] Invention and evolution in engineering and technology, determined and developed Artificial Intelligence. At first it worked on basic problem solving, representing knowledge and theorizing. It was also used in proving theorems, translations, associative memory and other basic algorithms.

Growth of Artificial Intelligence?

[7] Artificial Intelligence is one of the most rapidly emerging and advancing technology today. AI continuously progressed nearly every decade since the 1950's, when the programming language "Lisp" is designed by John McCarthy. It used to carry self-modifying applications. Later in 1970's when Expert Systems (ES) developed, Artificial Intelligence was referred as one of the frontier technologies. And after a decade, again AI was at the lead when the Japanese Government begin its research and development effort to develop an AI based computer architecture, which is called as Fifth Generation Computer System (FGCS). Now in the 2010's Artificial Intelligence is again leading in automation, robotics development, data analytics and so on. The current AI revolution can change the future world in many ways. [8] Artificial Intelligence has become more widely accepted and adopted by leading organisations as a competitive growth component. The capability for introduction of Artificial Intelligence into national economy system is immense and this cannot be relegated to individual companies or businesses. Above all it is the strategic on a national scale such as exploring optimal models of sectoral balance sheets. Formulation of target indicators for large corporations, supply of market and economic forecasting with aggregate demand, monetary-crediting system optimisation and so on. [9] In the latest days Artificial Intelligence (AI) and Machine Learning (ML) have advanced significantly permitting for a broad range of advantageous and useful applications. Now artificial intelligence is the crucial element of regularly used technologies like automatic speech recognition, machine translation, spam filters, and search engines. Driverless automobiles, digital assistants for nurses and doctors, and AI-enabled drones for expediting disaster relief operations are some of the interesting technologies currently being developed and implemented in small-scale pilots. Even, further in the future advanced AI technologies has the ability to reduce the demand for unnecessary labour greatly expediting scientific research, and improving the quality of governance. Artificial intelligence has a lot of advantages and many of these developments excite us but there are also ways through which AI might be exploited negatively. By preventing or minimising this risk we can not only avoid the corresponding problems but can also avoid the delay in the development and growth of AI's positives and advantages.

Artificial Intelligence in Health Care Appliances

[10] Artificial intelligence generated medical and biological technologies are rapidly developing into applications for medical practices. Intelligent computer programmes and algorithms can deal with increasing amounts of information which can be provided by smart phones, wearables and other mobile monitoring sensors in different areas of medicine. Currently, only very specific settings in clinical practice benefit from the application of artificial intelligence, such as the detection of atrial fibrillation, epilepsy, seizures, hypoglycemiaand some other organ diagnosis based on medical examination.[11] Today's modern health care and its medicine includes monitoring of and benchmarking with predefined quality indicators which results on the implementation of the best practice. There is a chance of microbiological findings which result in healthcare-associated

infections (HAIs) but with the help of MOMO, a modern microbiology analytics software, as well as with MONI, a fully automated detection and monitoring system an automated detection and monitoring system, we can detect the HAIs. This results a high systematic care of the patients and their safety with no type of error.[12] AI track, trace and monitor patients. Information systems related to AI are the new yielding sources of the medical evolution and building of a global economy. Internet of things (IOT) acts as an important role in the growth of Information systems. However, it is really important that the medical institutions trust the IoT systems regarding their performance, security, privacy, reliability and return-on-investment, which are an open challenge of current IoT systems. [13] Forms of Artificial Intelligence (AI) such as algorithms and neural networks are thoroughly investigated for new medical applications in areas like imaging and diagnostics, risk analysis, lifestyle management and monitoring, health care information management and virtual remote health care assistance. Increased speed in image processing, better vision into predictive screening, and decreased healthcare expenditures and inefficiencies include as expected benefits in this field. On the other hand, AI automated medical and clinal techniques create a lot of new circumstances wherein commonly-held values and ethical principles may be challenged.

Artificial Intelligence Manufacturing and Production

[14] AI is called to be the fourth Industrial revolution. Computational Systems with programming Intelligence can resolve various complex problems in the real world. Artificial Intelligence with the help of big data changed all the industries and revolutionised the business around the world which resulted in increase of the economic growth.[15] There are many new innovative technologies like Cloud Computing, Internet of Things involved (IoT), the Industrial Internet of Things; Big Data; Blockchain; Cyber-Physical Systems; Artificial Intelligence in the fourth industrial revolution. Artificial Intelligence mainly plays a really important and significant role in this Industry 4.O model. AI in manufacturing is observed two peroids:1979-2010 and 2011-2019 which are considered as before and after origination of industry 4.O. It mainly includes things like big data, cyber-physical systems and smart manufacturing and real time algorithms.[16] Advanced analytical computing and deep learning made the evolution of manufacturing system applications in an automated way. Industries and manufacturing units are seeking opportunities to replace the traditional research approaches to newly developed concepts and technologies of the Internet of Things (IoT), and cyber-physical systems.[17] Artificial Intelligence (AI) accelerates the combination of manufacturing of information and communication technologies, including computing, communication, and control, enabling high value-added manufacturing to the next generation of smart factories to support new varieties and small customized production modes. AI technology enables manufacturing systems to recognize the environment, adapt to external requirements, and extract process knowledge, including business models such as smart production, network collaboration, and extended service models.[18] Intelligent Manufacturing is a new advanced manufacturing representation and the practical means by which new information and communication technologies intelligent science and technology, large manufacturing technology (including design, production, management, testing, and integration), system engineering technology, and related product technology are assimilated with the entire system and product development lifestyle. To allow the assimilation and improvement different components of a manufacturing organisation or group, the life cycle of industrial production uses autonomous sensing interconnection, collaboration, learning, analysis, cognition, decision-making, control, and

the execution of human, machine, material, and environmental information which include three elements (people/organizations, operational management, and equipment and technology) and five flows (information flow, logistics flow, capital flow, knowledge flow, and service flow). This facilitates production and deliver customers high efficiency, high quality, cost-effective, and environmentally friendly service for consumers, and increases the competitiveness of the manufacturing company. In the field intelligent manufacturing, artificial intelligence technology supports the advancement of new models, means, and forms, system architecture, and technology systems (Li *et al.*, 2014; NMSAC and SAC-CAE, 2016).

New Models: An advanced manufacturing approach that is internet-based, service-oriented, collaborative, customizable, flexible, and socialized to the consumers.

New Means: Digitalization, Internet of Things (IOT), virtualization, service, collaboration, customization, flexibility and intelligence are all components of human intelligence machine-oriented manufacturing systems.

New form: The features of an intelligent industrial environment comprise ubiquitous interconnection, data-driven Ness, cross-border integration, autonomous intelligence, and mass innovation.

The strong combination of multiple systems, techniques and concepts will ultimately form an intelligent manufacturing community.

Artificial Intelligence in Security and Surveillance

[19] The human eye is a very efficient device that scans large amounts of low-level visual sensory data and delivers selective information to the brain for high-level semantic explanation and context recognition. But over the past few decades, the computer vision community has tried to provide similar perceptual functionality to artificial visual sensors. Considerable efforts have been made to understand the consistent images and processes of each individual object in the human visual system. An important application for video analysis and understanding which is a part of intelligent surveillance aimed at automatically interpreting human activities and detecting abnormal events that can pose a threat to public security and safety is developed. [20] Current Achievements and developments in Artificial intelligence influenced the military equipment and power with deliberate competition effected the world politics widely. AI can be a major potential source of unpredictability and vulnerability which results in huge demanding strategic competitions around the world. AI can have a great impact on military applications from a tactical and diplomatic battlefield perspective to a deliberate level.[21] The environment of security and possible risk for citizens, organizations, and states is changing in response of Artificial Intelligence (AI) and Machine Learning (ML). Illegal use of AI could affect digital security (example: through criminals training machines and algorithms to hack or social engineer victims at human or superhuman levels of performance), physical security (example: non-state actors weaponizing consumer drones) and political security (example: through privacy-eliminating surveillance, profiling, and repression, or through automated and targeted disinformation campaigns). The negative use of Artificial Intelligence will have consequences for how we develop and maintain our digital internet platform, as well as how we design and spread AI intelligence systems and will definitely require policy and other institutional responses.[22] Change in military superiority, information superiority and economic superiority will affect the national security due to advances in Artificial Intelligence. For a military advantage, the development of AI will enable new capabilities and make existing

capabilities more accessible to broader extent of people. Activities that currently require a lot of advanced labour, such as continuous threats in the cyber sector, will be mostly automated in the future and can be easily accessible in the black market. Forgery of audio and video media enhanced by AI is rapidly improving in quality and also easily affordable today. This results in loss of trust over many institutions.

Artificial Intelligence in Education

[23] Artificial Intelligence in Education (AIED) covers a broad range of advanced Technology and Innovations from AI-driven, sequential effective learning and dialogue structures. By AI assisted effective Learning student writing analysis, cognitive computing agents like bots in gaming scenarios and student support chat bots in such a way the students are in complete control of their own learning. It also allows students to engage and interact with one another through computers, the entire techniques, students using devices like mobile phone out of the classroom and lot more. Furthermore, AIED gives an insight on educational and learning approaches. AIED is derivative and innovative at the same time. It combines theories and approaches from sectors like Artificial Intelligence, Cognitive sciences and Education.[24] In the last twenty-five years Artificial Intelligence in Education (AIED) sector has undergone major advancements. There are two simultaneous components that needs to emerge in order to have an influence on education in the next twenty-five years. One is an adaptive and evolutionary process that focuses on present classroom approaches, interaction with teachers, and enhancing advanced technologies and ranges. The other is a transformative process, where we insist to integrate technologies within students' everyday lives, encouraging their cultures, goals, practices, and communities.[25] Web Intelligence (WI) is an important aspect of Artificial Intelligence in Education (AIED). WI addresses the basic roles as well as limited impacts in both Artificial Intelligence (AI) and Information Technology (IT) sectors in the coming generation of Web-insisted products, systems, services, and activities. WI is highly advantageous in the field of AIED as a direction for scientific research and development. Some main elements such as ontologies, adaptivity and personalization, and agents are the fundamental components that attracted AIED researchers for quite some time. WI focuses on other issues like intelligent Web services, semantic mark up, and Web mining in AIED.[26] Artificial Intelligence is a branch of study which developed in computers, machines and others systems possessing human-like intelligence distinguished by cognitive abilities, learning, adaptability, and decision-making capabilities. According to the results, commonly recognised and applied in education, especially by educational institutions in multiple kinds. AI actually started in the form of computer kind of technologies proceeding to web based online intellectual educational standards and ultimately with the use of embedded computer systems, together with other technologies the use of humanoid robots and web-based chat bots to perform instructor's tasks and functions independently or in cooperation with the instructors. Instructors were able to implement many management responsibilities such as monitoring and grading student's assignments, using these platforms more effectively and efficiently, which to improve the quality of their instructional activities. On the other hand, the system utilises machine learning and flexibility, content and curriculum have been adjusted and modified to meet student needs improving overall learning experiences as well as increasing learning effectiveness and maintenance.

Advantages of Artificial Intelligence

[27] Artificial Intelligence (AI) applications are used to integrate human intelligence in order to solve problems or taking decisions. AI allows the advantages of permanency, reliability, and cost-effectiveness which also resolves uncertainty and speed in solving problems or taking decisions. AI is applied and developing in various fields and professions like Engineering, Economics, Linguistics, Law, Manufacturing, Medicine, and for a variety of modelling, Prediction, decision support and control applications. The use of Internet in search engines has been rigorous and became one of the most emerging applications of AI.[28] Despite the utmost efforts it is well known that humans exhibit many emotions in their day to day lives which affects their work in a negative way. But machines and programs with artificial intelligence do not require sleep and doesn't get tired eradicating the basic disadvantage of humans. Artificial Intelligence makes decisions and works based on facts rather than emotions. Through artificial intelligence knowledge can be conveyed and spread more easily. Once a programs or application gets updated or trained for something, it can be readily available to others which saves the time and efforts.[29] Artificial Intelligence has many benefits. It allows an opportunity to develop completely and automate to the history of artificial robots. Finishing the given task faster than humans, can complete the stressful and exhausting work easily, solving complex problems in short period of time, multi-tasking, high success ratio compared to humans, less errors in task and defects, more accuracy in short time, calculations of long term and complex situations and discovering unexplored things like outer space are some of the main advantages of Artificial Intelligence.[30] Human labour can be reduced by replacing people by computers and machines. Continuously programming, self-writing, self-modifying makes humans exhausted. By using AI, the work will be fast and profitable. AI can be implemented easily. Modern advanced companies use digital assistants or bots to engage with people minimizing the need for human resources. Many online websites are also designed and runed using digital assistants to provide customers with the item they desire. We can make computers make decisions by merging AI and other technologies to perform actions faster than humans. Many people actually who are unaware of Artificial Intelligence use the applications such as Apple's Siri, Microsoft's Cortana, Google's OK Google commonly and easily to find locations, taking a selfie, making a phone call and for many other uses.[31] Robotics is a study of Artificial Intelligence (AI) and Machine Learning (MI). Machine Learning is said to be today's most powerful and profitable, artificial intelligences created. It exhibits relatively a limited range of intelligent behaviour. Machine Learning algorithms are mostly designed to perform one task to generate accurate predictions. In today's world people opt for automation in every aspect possible. Robots and Intelligent machines can not only provide assistance and convenience but also lifesaving capabilities. Robots are used in medical diagnostics purposes which have high accuracy. They are also used to examine dangerous activities and objects using remote control and integrated camera systems. In situations like defusing a bomb without a human being in close with it, robots are a very good use. The 'Robo Gas Inspector,'23 a robot equipped with remote gas detecting technology, can inspect technical infrastructure even in difficult-to-reach regions without endangering humans, such as to detect leaks in above-ground and underground gas pipelines.[32] Furthermore, it will have a substantial impact on business and employment, leading to high interconnecting organizations with decision making based on the analysis and utilization of big data as well as increased global competitiveness among business. People will be able to buy things and get services from anywhere around the globe using Internet and other AI oriented innovations. Significant competitive advantage will continue to accumulate for those who want to take entrepreneurial risks to make extensive use of the Internet and transform innovative products/services into global commercial success stories.

Challenges or Disadvantages of Artificial Intelligence

[33] Some of the main disadvantages of Artificial Intelligence (AI) is that it can be misused resulting in large scale disaster, affecting Human careers and jobs, it is sometimes done in opposite way to the given command and mismatches, increased Unemployment, no creativity, it lacks Human touch, people become adapted to the automation and gets lazy and technological reliance increased.[34] Some of the equipment are expensive and it isn't easy to develop the machines. It costs time and resources to create, rebuild and repair which involves humans to lead the entire process. Humans addict to these innovations and technologies which effects the future generations in a negative way. Many companies and organizations are trying to replace the least skilled employees to AI robots that can perform similar work more effectively. Machines are definitely best when it comes to effective performance but replacing human connection that create the team. Machines cannot develop bond with humans which is a crucial aspect when it comes to Team Management. Machines can only work and accomplish it's tasks for which they are built or programmed, anything beyond their limit causes them to crash or deliver unrelated outputs and errors which is a serious drawback.[35] It is a fact that rise of AI technology not only give automated products but will also automate people jobs which eventually leads to massive unemployment. In future there would be no source for programmers. As told the goal, after all, should be a technology that benefits people but not one that destroys them. [36] An emerging iteration of Autonomous Weapon Systems (AWS) combining with AI systems foreshadows a strong interaction of increased range, accuracy, mass, adjustment, intelligence and speed in future collisions. As a result, the risk of increasing use-them-or-lose-them scenarios between nuclear-armed military forces and the attendant dangers posed by the use of unreliable, unverified and dangerous AWS will increase, resulting in potentially terrible strategic outcomes. It disturbs the World peace and affects many people around the world if utilised in a wrong way.[37] Though Artificial Intelligence is automated it still has to gain trust of humans in many aspects. According to human nature, people tend to stand away from things that are complicated. AI still should be reliable and easy to understand in various fields. The industrial sector also lacks advanced technical staff related to this technology, so owners must be able to train employees properly to ensure the benefits of artificial intelligence. We know that humans are not perfect but how can a manmade machine can be totally perfect? In case of any technology's software or hardware crashes, it is too hard to find the main cause of the problem sometimes. AI can't replace everything but can increases the productivity of all tasks. AI can manage everyday life, many tasks, many processes, and even minute thing but this may be true to some extent only, not all tasks can be managed by AI. The biggest challenge facing society and businesses is to take advantage of the benefits of using AI technology to provide vast opportunities for new products or services and tremendous productivity improvements. Every technology has its own limitations. AI is still in its early and initial phases and has a lot to deliver and progress.

Conclusion

In my opinion, even if Artificial Intelligence isn't completely developed it is showing its strong potential in various sectors of our lives. Many Big companies today run-on Artificial Intelligence. AI today influenced many daily activities in a human life both personally and professionally. People of almost all ages depend on AI for their daily needs. As humans can't give an automated work always, he chooses an automated machine to work for him. Most of the comforts people experiencing now a days are delivered by AI. Although the intelligent machines and gaming

software were created and developed by humans, it is really tough to a human to compete with an AI oriented application or bots. The good thing about AI is that it can solve problems ranging from simple to complex applicative difficulties, as well asmake decisions in real world situations allowing people to use this more efficiently.

References

Abdulov, R. (2020). Artificial intelligence as an important factor of sustainable and crisis-free economic growth. *Procedia Computer Science*, *169*, 468-472.

Allen, G., & Chan, T. (2017). *Artificial intelligence and national security*. Cambridge, MA: BelferCenter for Science and International Affairs.

Alshehri, F., & Muhammad, G. (2020). A Comprehensive Survey of the Internet of Things (IoT) and Edge Computing in Healthcare. *IEEE Access*.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intelligence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Briganti, G., & Le Moine, O. (2020). Artificial intelligence in medicine: today and tomorrow. *Frontiers in medicine*, *7*, 27.

Brundage, M., Avin, S., Clark, J., Toner, H., Eckersley, P., Garfinkel, B., ... &Amodei, D. (2018). The malicious use of artificial intelligence: Forecasting, prevention, and mitigation. *arXiv preprint arXiv:1802.07228*.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.[5]

Charniak, E. (1985). *Introduction to artificial intelligence*. Pearson Education India.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chowdhury, M., &Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Devedžić, V. (2004). Web intelligence and artificial intelligence in education. *Educational technology & society*, *7*(4), 29-39.

Dick, S. (2019). Artificial intelligence.

Furman, J. (2016). Is this time different? The opportunities and challenges of artificial intelligence. *presentation, AI Now: The Social and Economic Implications of Artificial Intelligence Technologies in the Near Term, New York, NY*.

Ghimire, A., Thapa, S., Jha, A. K., Adhikari, S., & Kumar, A. (2020, October). Accelerating business growth with big data and artificial intelligence. In *2020 Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC)* (pp. 441-448). IEEE.

Gong, S., Loy, C. C., & Xiang, T. (2011). Security and surveillance. In *Visual analysis of humans* (pp. 455-472). Springer, London.

Jaakkola, H., Henno, J., Mäkelä, J., &Thalheim, B. (2019, May). Artificial intelligence yesterday, today and tomorrow. In *2019 42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO)* (pp. 860-867). IEEE.

Johnson, J. (2019). Artificial intelligence & future warfare: implications for international security. *Defense& Security Analysis*, *35*(2), 147-169.

Johnson, J. (2020). Artificial intelligence, drone swarming and escalation risks in future warfare. *The RUSI Journal*, *165*(2), 26-36.

Katare, G., Padihar, G., & Qureshi, Z. (2018). Challenges in the integration of artificial intelligence and internet of things. *International Journal of System and Software Engineering*, *6*(2), 10-15.

Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine. *Gastrointestinal endoscopy*, *92*(4), 807-812.

Khanzode, K. C. A., &Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Khanzode, K. C. A., &Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Koller, W., Rappelsberger, A., Willinger, B., Kleinoscheg, G., &Adlassnig, K. P. (2021). Artificial Intelligence in infection control—healthcare institutions need intelligent information and communication technologies for surveillance and benchmarking. In *Soft Computing for Biomedical Applications and Related Topics* (pp. 37-48). Springer, Cham.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

Makridakis, S. (2017). The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms. *Futures*, *90*, 46-60.

McCarthy, J. (1998). What is artificial intelligence?.

Racine, E., Boehlen, W., & Sample, M. (2019, September). Healthcare uses of artificial intelligence: Challenges and opportunities for growth. In *Healthcare management forum* (Vol. 32, No. 5, pp. 272-275). Sage CA: Los Angeles, CA: SAGE Publications.

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education*, *26*(2), 582-599.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Wan, J., Li, X., Dai, H. N., Kusiak, A., Martínez-García, M., & Li, D. (2020). Artificial-intelligence-driven customized manufacturing factory: key technologies, applications, and challenges. *Proceedings of the IEEE*, *109*(4), 377-398.

Wisskirchen, G., Biacabe, B. T., Bormann, U., Muntz, A., Niehaus, G., Soler, G. J., & von Brauchitsch, B. (2017). Artificial intelligence and robotics and their impact on the workplace. *IBA Global Employment Institute*, *11*(5), 49-67.

Woolf, B.P. (2010). Building Intelligent Interactive Tutors: Student-Centered Strategies for Revolutionizing e-Learning. Morgan Kaufmann, 11.

Zeba, G., Dabić, M., Čičak, M., Daim, T., & Yalcin, H. (2021). Technology mining: Artificial intelligence in manufacturing. *Technological Forecasting and Social Change*, *171*, 120971.

LiFi TECHNOLOGY

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Abstract

With the onset of the 20th century, there was an exponential rise in the number of internet (WiFi) users, as a result of which the network speed consequently decreased. To overcome this obstacle the concept of LiFi was introduced by the German physicist Herald Haas in which data in the form of light is transmitted through a LED light bulb, whose intensity varies in speed much faster than what the human eyes can follow. It is expected to be the technology of the future, which can provide data to the masses at a consistent rate of 10Mbps which is much faster than the existent average broadband speed.
Keywords: *LiFi, WiFi, the VLC (Visible Light Communication), LED (Light Emitting Diode), wireless communication*

Introduction

In this modern age, human dependence on the internet through both wired and wireless networks has been increasing exponentially. Due to day to day increment in the number of users of the wireless network, the speed of data transmission is consequently getting reduced. The average Wi-Fi speed of 150 Mbps is often insufficient to accommodate such a large number of active users. To overcome this limitation, the concept of Li-Fi technology came into view. Li-Fi here stands for Light Fidelity. It is the brainchild of German physicist Herald Haas and was first showcased in his TED Global talk on VLC. The concept behind this technology involves the transmission of data through visible light (LED) which varies in intensity which is faster than what human eyes can follow. Addition of unutilized bandwidth of visible light offered by Lai-Fi resolves the issue of network trafficking faced by current Wi-Fi systems. It offers a broader frequency band when compared to the one available in Radio Frequency (RF) communications. Further, it helps in eliminating health concerns due to electromagnetic waves associated with Wi-Fi. Taking advantage of the low-cost nature of lightening units and LED lights, opens various fields of applications ranging from public internet access through street lamps to communication of automobiles through their headlights. Li-Fi can hence be termed as the technology for the future, where the light in a room could be used to transmit data through smartphones, laptops and tablets.

Literary Survey

[1] Current Wi-Fi systems are subjected to certain problems like a lackof available spectrum, efficiency, health concerns and security. LiFi is one of the strongest candidates to solve these problems. LiFi uses LED as the transmitter which uses visible light gives us some advantages as LED is non-toxic, can fluctuate very quickly, data can be transmitted at an intensity invisible to human eyes, produces more power than incandescent lamps, the visible light could give us speed in Gigabits per second. With different sizes of LED, we can get different speeds. There are certain LiFi modulation schemes can be used example On-Off Keying (OOK), Variable Pulse Position

Modulation (VPPM), Colour Shift Keying (CSK), Sub-Carrier Inverse (SCIPPM), Frequency Shift Keying (FSK) and Sub-Carrier Index Modulation (SIM-OFDM). There are certain high-speed models that have been tested: Giga Shower, Giga Spot, Giga-MIMO and some other in-house communication models. This has many applications, example, and communications inside airlines which don't interfere with the aircraft signals, underwater communications, traffic, Gigabit technology and in hospitals. Like Wi-Fi, it also comes with some disadvantages the most prominent being visible light cannot pass through opaque objects and the high cost of installation. [2] In order to overcome the shortcomings of WiFi Harald Haas, a professor at the University of Edinburgh, proposed the LiFi technology. The 5G technology uses LED to transfer data. LiFi is preferable for transferring a large amount of data in the speed of Gigabits. Modulations used in the LiFi systems are based on the principle of intensity modulation, that is, information can be stored as varying light intensities. Radio waves and low powered infrared waves are not reliable due to security concerns. Due to carcinogenic effects of gamma and UV radiations are strongly discouraged for communications. Moreover, the equipment required for LiFi communications are already available. LEDs are economically efficient in terms of energy hence gives a cheap data transfer. Since communication solely depends on the lightthere is no cost for WiFi equipment like routers. [3] Lifi stands for 'Light Fidelity' which uses visible light instead of radio waves. Father of LiFi, Harald Hass, considers that the intensity and potential of the LED lie at the heart of this technology. LiFi is a cheaper and faster alternative to WiFi. Visible Light Communication (VLC) technique uses a frequency of 400THz to 800THz as carrier waves. VLC is better than higher frequencies like Gama rays and ultraviolet waves as these are carcinogenic. VLC is also better than a lower frequency as infrared is dangerous and radio waves are not secure and expensive. It can be used in the hospitals, medical instruments, in traffic lights which can reduce the chances of accidents and also in chemical plants where other frequencies could be dangerous. [4] LiFi is a good step towards internet of things, where everything is interconnected, with LED as a transmitter. The li-fi market has already been benefitting from this technology. It has the capability of high-speed data transmission through a light embedded on a microchip which is much faster than the current internet speed. LiFi has 4 basic or primary sub-assemblies: bulb, RF power amplifier circuit (PA), printed circuit boards (PCB) and enclosure. The PCB takes care of the inputs and outputs of the lamp which is managed by the microcontroller for different functions. The input power is amplified and transferred to the bulb where a high power concentration vaporizes the content of the bulb converting it into plasma. This plasma can be controlled to produce to produce a pulse of data. All these are kept in an aluminium enclosure. The bulb sub-assembly is embedded in a dielectric material which concentrates the electric field in the bulb. This assembly is better than the conventional ways in which we used degradable electrodes instead of dielectrics. [5] In this 20th century, mostly everyone is familiar with WiFi, which has become an absolute necessity for delivering wireless access of internet around homes, offices, colleges, hospitals, and many other public places. However just like most of the technologies, even it has its own limitations. With the advancement of science, it is obvious that new technologies are bound to be developed which could help overcome these limitations. This is what led to the advent of LiFi, where visible light is the source of data transmission, it offers a totally new paradigm in wireless technologies, offering higher speed, more flexibility and better usability. The standard wireless communication speed is around 500mbps, as compared WiFi's 50-100 Mbps. As it uses light instead of radio frequency signals, it could be used in aircraft, medical devices in hospitals and other places where internet, Bluetooth and WiFi is banned due to safety reasons. Further, it can

also be used underwater where other forms of data transmission are not expected to work. It is also more secure as it cannot penetrate through walls and hence cannot be intercepted or misused which minimizes its vulnerability to hackers. Further it can be used to control traffic through communication between the LED backlights and headlights of vehicles in order to prevent accidents. [6] LiFi works on LED lights, which are a source of illumination when provided with a constant current. When these currents are varied at a rapid rate, the resulting light output can be made to vary at extremely high speeds. For further better outputs LEDs can be used in an array for parallel transmission or an amalgam of three basic colors, green red and blue are used as they have different frequencies and consequently different data channels. The basic principle involves the use of data from the internet and the local network to modulate the intensity of the LED light source in a way undetectable to the human eye. The photodetector picks up the signal, which is converted back into a data stream and sent to the client. The client can communicate through its own LED output or over the existing network. With the establishment of new technologygives such as 3G and 4G, the capacity of the radio spectrum is drying up. In comparison, the visible light spectrum has a lot more spectrum space due to the presence of already installed light boxes. The only major obstacle which is hindering the progress of LiFi technology is the requirement of line of sight and the inability of light waves to penetrate thick objects such as brick walls. [7] In visible light communication the visible lights frequency range is from 400 THz to 800 THz. The various components present in the system include a very bright white LED, which is the communication source and a silicon photodiode that responds well to rays in the visible wavelength region. The light source (LED) is used for communication by modulating it with the data signal. Due to its fast flickering rate, it appears as if the light is constant. Different LEDs transmit at a different data rate, the speed of which can further be increased using LED arrays. LiFi technology includes several benefits apart from its ability to be used in certain places where other forms of a network like Bluetooth, WiFi etc do not work. These benefits include the wide wavelength range, high magnitude colour fidelity, instant start time, easy modulation of the light output for enhancing video contrast and easy terminal management. With light which is easily available being the major source of this technology, this technology can be of immense benefit to mankind in various fields such as industry, medicine, education and the like. [8] The Li-Fi technology came as the best solution to offload a large part of traffic from the overcrowded RF domain. It is so far the best alternative as it uses Visible Light Communication. The spectrum of visible light has a broader range of bandwidth which is way more than the RF spectrum. As this concept uses visible light which has a speed of 1080 million km/hr, the rate of transmission of data is very high and cannot be followed by human eyes. Sometime back the R&D centre of pure VLC was able to achieve a data rate of 3.5Gbps from a single colour led which operated at 5mW at a distance of 1 m and a rate of 10 m at a distance of 10 m. so it was deduced that with the use of 3 colours led the rate of transmission would be more than 10Gbps.

Li-Fi technology providing reliable, cheap and secure communication has application in hospitals, home appliances, the petrochemical industry and indoor navigation. So Li-Fi systems will change the world of wireless communication in greener ways.[9] Li-Fi technology would change the future of wireless communication. It has the capacity to provide fast internet connectivity and a broader spectrum. It could be said to be an optimized version of Wi-Fi. It would be using light from the visible region instead of using the infrared rays to transmit data. Data is encoded in the flickering light which will give various different patterns of 1s and 0s. Since the rapid modulation of intensity, the output seems to be constant. Li-Fi can overcome all the hindrance caused by Wi-Fi like capacity,

availability, efficiency, security. The bandwidth of light is 1000 times broader than radio waves. It consumes less energy and has a higher efficiency. Availability won't be an issue since light sources are everywhere. Theoretically, it will provide a speed of 1 to 10 Gbps. This technology is facing some challenges in its implementation. The access of internet would be lost if the source malfunctions. Since light can penetrate through the opaque object anybody could easily block it. Change of weather is also a major problem if the system is set up outdoors. A technology with such vast possibilities if implemented can change our lives and make it more technology driven. [10] Light fidelity which is dubbed as Li-Fi uses light to transmit data rather than radio is the emerging technology that will make access to data very easy. Although any kind of light source can be used to transmit data some are given priorities because of their operational properties. Therefore LEDs with equipped transmitters will be the best source. The basis of the visible light communication is the Orthogonal Frequency Division Multiplexing. used to convert data in the electric pulse. To enable communication at the high-speed light is modulated without interfering with the illumination property of source. The system has applications in many fields but still lacks in a few areas which need more research. Application specific circuits are required to form a miniature of this technology. Soon it will overcome the few obstacles in its implementation and status of data will change from online to on light.

Findings

LiFi technology has a great potential for becoming a major part of the upcoming 5G technology. This technology can give us tremendous speed in Gbps with the help of modern technologies. LED light has played a key role in LiFi as it is cost as well as energy efficient. It detects the light fluctuations. LED could send a large amount of data in a comparatively less time. The only major drawback of this technology is that it cannot pass through opaque objects. It also has a broader frequency bandwidth of 400 THz- 800 THz. Technology like this with such a wide area of implementation will change the world of wireless communication for the better.

Conclusion

It can be concluded that Li-Fi is indeed the technology of the future, and it would play a major role in the scientific arena in the upcoming years, provided we find an apt solution to the few existing obstacles. Li-Fi could be of immense help in various fields such as education, medicine, industry and other related fields. Once put into practical use a mere bulb could be used as a Wi-Fi hotspot for efficient transmission of data as we would parallelly proceed towards a Greener and a safer future.

References

Bhut, J. H., Parmar, D. N., & Mehta, K. V. (2014). LI-FI Technology–A Visible Light Communication.

Garg, R. (2012). Li-Fi: Data Onlight Instead of Online. *a National Journal of Computer Science & Applications*, *1*.

Hassan, S., & Saeed, K. (2017). Li-Fi Technology: Data Transmission through Visible Light. *World Academy of Science, Engineering and Technology, International Journal of Electrical, Computer, Energetic, Electronic and Communication Engineering*, *11*(7), 917-920.

Kumar, S. V., Sudhakar, K., & Rani, L. S. (2014). Emerging Technology Li-Fi over Wi-Fi. *International Journal of Inventive Engineering and Sciences (IJIES)*, *2*(3).

Mishra, P., Poddar, J., & Priya, S.(2016). A review on LiFi: the green WiFi. *Int* Res J EngTechnol, 3,99-103.

Mutthamma, M. (2013). A survey on Transmission of data through illumination-Li-Fi. *IJRCCT*, *2*(12), 1427-1430.

Navyatha, N., Prathyusha, T. M., Roja, V., & Mounika, M. (2013). Li-Fi (Light fidelity)-LED Based Alternative. *International Journal of Scientific & Engineering Research*, *4*(5), 1039-1042.

Polshetwar Poonam, V., & Siddiqui, M. S. (2014). Li-Fi Technology. *Polshetwar Poonam V. et al,/(IJCSIT) International Journal of Computer Science and Information Technologies*, *5*(6), 8031-8032.

Sarkar, A., Agarwal, S., & Nath, A. (2015). Li-Fi technology: Data transmission through visible light. *International Journal of Advanced Research in Computer Science and Management Studies*, *3*(6).

Swami, N. V. (2015). Li-Fi (light fidelity)–the changing scenario of wireless communication. *IJRET: International Journal of Research in Engineering and Technology e-ISSN*, 2319-1163.

ARTIFICIAL INTELLIGENCE IS NOT A MATTER OF SCIENCE FICTION

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What is AI?
[1] It is the science of manufacturing intelligent machines. It is relatable to recognize human intelligence but it doesn't limit the methods which are related biologically. It is the analytical part of the potential to achieve goals. It is the ability of a machine to complete or perform the tasks that are usually done by humans. It's analogous task of utilizing computer to understand human intelligence. Artificial intelligence (AI) is intelligence demonstrated by machines, as opposed to natural intelligence displayed by animals including humans. [2] It is an idea to make machines capable such that they can perform tasks such as learning, self-correction etc which are related to human intelligence. By improving the programming method we can study the use of machines effectively. The use of mechanical tools has expanded the use of human intellect by utilising computers.AI means to develop systems that think like and behave like humans, they think and behave rationally. Artificial intelligence was founded as an academic discipline in 1956, and in the years since has experienced several waves of optimism, followed by disappointment and the loss of funding (known as an "AI winter"),followed by new approaches, success and renewed funding.

History of AI
[3] Alan Turing proposed a definition fro determining whether or not the software is intelligent in 1950. The history of artificial intelligences the history of dreams, potential, demonstration and promise. The beginning AI was considered to be science fiction then there were inventions in the fields like electronics which proved it wasn't just imagination. Some of the early phases of AI include language understanding and translation, solving theorems etc. [4]The first work which is now recognized as AI was done by Warren McCulloch and Walter pits in 1943. Donald Hebb demonstrated an updating rule for modifying the connection strength between neurons. His rule is now called Hebbian learning. When AI was first described there were several limitations for acceptance on medicine. Many of these limitations were overcome by deep learning. Now the AI are capable for solving complex problems as well as algorithms. Work efficiency in medical field is really improved by using it such as diagnostic accuracy etc. Gottfried Wilhelm Leibniz seemed to believe that mechanical reasoning devices could be used to resolve conflicts using logic rules. Both Leibniz and Pascal created calculating machines, which has previously been in the domain of the trained individual. In the year1966, the researchers emphasized developing algorithms which can solve mathematical problems. Joseph Weizenbaum created the first chat bot in 1966, whichh was named as ELIZA

Growth of AI
[5] Artificial intelligence can be used everywhere in the production of goods and services affecting the economic growth and income distribution. It is increased a lot in the last decade. AI has been advancing in terms of resources as well as in outputs. It can beat a human in various games that

require complex strategy. Virtual assistants such as Alexa and Siri, and Amazon's new cashier-less and cash-less grocery stores has developed recently which eases our work. The growth in this field has a variety of applications in health-care, security, manufacturing and production etc. A lot of solutions such as AI-specific commission, to data portability, to UBI and other strategies has been used due to increase in economy due increase in use of AI.[6]Journalistic organizations can easily keep up with current events and produce content that accurately summarizes evolving circumstances by applying these sophisticated algorithms to vast amounts of data from press releases, tweets, articles, and other unstructured content. AI may alter the way in which we develop ideas and technology assisting the solution of complicated issues and creative .We see AI as the new type of automation that has the potential to automate the processes that were previously thought impossible to automate. It has affected economic growth and income shares widely. It can help to solve problems in a more effective manner. In span of year it has also changed the process of creating new ideas and technologies. It is being used to collect information from different sources instantly. AI systems are increasingly being used by content and news organisations to discover data from various sources and instantly summarize it into content or supporting analysis for those articles.

AI in Healthcare Appliances

[7]At the initial stage, technology was merely used to automate the most routine and monotonous tasks and cut down on the use of paper through digitization of health records while also aiding in the easy flow of this information among insurance companies, hospitals, and patients. sensors are some appealing sciences for fostering centres and technology growth in the current society because of vast usage in personal electronic gadgets and industrial monitoring. There are some healthcare devices such as flexible pressure sensors made with the help of AI have some advantages such as they are of low cost and provide extra flexibility. There are many health care devices in which you can have very promising applications. [8] It is also used in data management for maintaining records of numerous patients at a time. It becomes very difficult to store that data in pages so it helps to collect, store, re-layout, and trace data to offer faster, more consistent access. Data management is one of the most important applications of AI and used widely. [9] There are some mobile apps that can monitor our health for example: m-health. There are also watches which can determine our heartbeats and emotional condition of the user. Such applications built on the mobile helps us in generating a self-health report. Due to lack of social care to the old people it is necessary to develop a cost effective assisting healthcare technological solutions for the care of the elderly and providing them with the most technical friendly experience possible.

AI in Manufacturing and Production

[10] In the has few decades, AI has become a major part of manufacturing smart machines and has a major part in modern industries. Industrial AI also known as IAI has critical technologies for the evolution of industrial manufacturing. Deep neural networks, adversarial training, and transfer learning are some of the methods used for the maintenance of the production process. [11] It improves the competition in the market as well as provides high efficiency, high quality, cost-effective, and environment-friendly service for users. It eases the evolution of new model system architecture and technology systems. Manufacturing requires acute attention to detail, a necessity that's only exacerbated in the electronics space. Historically speaking, quality assurance has been a manual job, requiring a highly skilled engineer to ensure that electronics and microprocessors were

being manufactured correctly and that all of its circuits were properly configured. [12] There are developments specifically in semiconductor manufacturing. The main aim of this is to provide perception of the latest improvement in the research community which includes maintenance and manufacturing. The majority of these systems cannot still learn or integrate new information, resulting in countless false-positives, which then have to be manually checked by an on-site employee.

[13] AI can be used to spot cyber threats and possibly malicious activities. Traditional software systems simply cannot keep pace with the sheer number of new malware created every week, so this is an area AI can really help with. Now-a-days these are used for facial recognition, biometrics for more safety purposes. Governments are also using these tools to achieve or advance their political careers. It is used for reasonable purposes as well as illegal digital monitoring. [14] It provides the security against the cyber-crime. The AI can perform cyber-attacks using advanced viruses for evading the security perimeters. The Artificial Neutral Network (ANN) is used in cases to provide extreme security. [15] The UAV is equipped with camera equipped with cameras can capture images or videos to track targets such as people, vehicles or specific areas. In terms of ambient data and code driven connection now reach half of the world's population projecting previously unimaginable potential as well as unexpected risks. AI presents many advantages and applications in a variety of areas, cyber security being one of them. With fast-evolving cyber attacks and rapid multiplication of devices happening today, AI and machine learning can help to keep abreast with cybercriminals, automate threat detection, and respond more effectively than conventional software-driven or manual techniques

AI in Education

[16] AI has already been applied to education primarily in some tools that help develop skills and testing systems. AL based tools support learning sciences and these tools makes the understanding about the questions that are under investigation better. ITS provides a lot of flexibility in terms of material presentation and a lot of flexibility in terms of student's unique requirement.[17] By using AI platforms, teachers are able to perform different administrative functions, such as evaluating marks more effectively and efficiently which saves time and develops a higher standard in their teaching. [18] Adjusting learning based on an individual student's particular needs has been a priority for educators for years, but AI will allow a level of differentiation that's impossible for teachers who have to manage 30 students in each class. There are several companies. Students from different countries can learn and experience different cultures. AI can help in in-person online learning which helps the instructor to bridge the gap between the educator and the learners. AI has become one of the most fundamental, widespread and inescapable feature of daily lives, despite of its frequently concealing nature, from Siri to auto- journalism, from stock market forecast to crime prediction by facial recognition to medical diagnosis and beyond.

Advantages of AI

[19] AI has one of the most important advantage that its decisions are not based on emotions. On the other hand, even if humans make their utmost effort the decisions are still affected in a negative wat by emotions. [20] AI provides endurance, dependability and economical way and speed in solving the problems or giving a decision. It also deals with qualitative as well as quantitative data. It can also judge and anticipate traffic conditions. [21] AI has full capability in detecting faults or errors in

a building energy system and learn different patterns from the data. Daily applications such as Apple's Siri, Window's Cortana, Google's OK Google are frequently used in our daily routine whether it is for searching a location, taking a selfie, making a phone call, replying to a mail and many more. [22] To achieve clinically useful systems, both clinicians and technicians must cooperate to mitigate AI drawbacks. Although most of the current technological effort has been focused on creating more precise polyp detection and classification tools, it remains a long path to be covered before adopting AI-based technology into the physician's daily work as an assistive tool for diagnosis decisions.[23] It has been applied in various fields such as engineering, economics, linguistics, law, manufacturing and medicine. Two sectors that are greatly served by the development of AI are library and Information Science. There is also a well organised expert system for Information processing and management. It has also been installed in business, industrial, military, scientific sectors, academic and research organizations. An Average human will work for 4–6 hours a day excluding the breaks. Humans are built in such a way to get some time out for refreshing themselves and get ready for a new day of work and they even have weekly offed to stay intact with their work-life and personal life. But using AI we can make machines work 24x7 without any breaks and they don't even get bored, unlike humans.

Challenges or Dis-advantages of AI

[24] These are difficult to develop because the equipment required really expensive. It takes a large amount of time and cash to create, rebuild, and repair.[25] Deep AI solutions highly rely on Graphical Processing Units for fast processing. Processing Units is incredibly slow and hence unfeasible. AI is updating every day the hardware and software need to get updated with time to meet the latest requirements. Machines need repairing and maintenance which need plenty of costs. It's creation requires huge costs as they are very complex machines. [26] It can be used for mass scale destruction, increases unemployment, requires a lot of money and time, sometimes lacks in creativity. Due to lack of activities younger generation becomes lazy. [27] Most of the AI related ideas are implemented at the professional level, the idea of AI attaching more importance to integrating AI into business English education than in government and schools. [28] It disconnects students from teachers because it lacks emotions. Teachers fear their positions will be taken by the robots but robots cannot closely monitor the students personally in their classes. It lacks in the quality of team management. They cannot replace humans because they cannot make a bind with them this is the most important quality for team management. Machines can perform only those tasks which they are designed or programmed to do, anything out of that they tend to crash or give irrelevant outputs which could be a major backdrop

Challenges or Dis-advantages of AI

It the side of our life which always surprises us with new ideas, innovations, topics, etc. We have researched about a lot of topics in AI such as growth, healthcare, education, security, manufacture and production. Some of the experts predict that AI can do better than humans as it has a lot of advantages but there are also some disadvantages. This is not the end of the topic there is a lot more, who knows what standards will AI reach up to and surprise us. Artificial Intelligence (AI) is a broad branch of computer science that is focused on a machine's capability to produce rational behavior from external inputs. The goal of AI is to create systems that can perform tasks that would otherwise require human intelligence. It identifies patterns, analyses past data to infer the meaning of these

data points to reach a possible conclusion without having to involve human experience. This automation to reach conclusions by evaluating data, saves a human time for businesses and helps them make a better decision. If AI were to develop to the point that it can do everything better than humans, it would mean that it would also do better in science and technology. It may decide that it is no longer worthwhile to develop a certain field of research – or it may decide space travel is a waste of time as long as humans on earth are living in poverty and more than a billion people have no access to clean drinking water. Most scenarios about future AI are hypothetical, but AI presents us with existential questions. It shows that where science stops, philosophy and spirituality begin.

References

Aghion, P., Jones, B. F., & Jones, C. I. (2019). *9. Artificial Intelligence and Economic Growth* (pp. 237-290). University of Chicago Press.

Alotaibi, S. R. (2020). Applications of artificial intelligence and big data analytics in m-health: a healthcare system perspective. *Journal of Healthcare Engineering*, *2020*. [10] Ding, H., Gao, R. X., Isaksson, A. J., Landers, R. G., Parisini, T., & Yuan, Y. (2020). State of AI-based monitoring in smart manufacturing and introduction to focused section. *IEEE/ASME Transactions on Mechatronics*, *25*(5), 2143-2154.

Arivudainambi, D., KA, V. K., &Visu, P. (2019). Malware traffic classification using principal component analysis and artificial neural network for extreme surveillance. *Computer Communications*, *147*, 50-57

Artificial intelligence: definition, trends, techniques, and cases. Artificial

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. Aayushi International Interdisciplinary Research Journal, 227-230

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chowdhury, M., &Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Feldstein, S. (2019). *The global expansion of AI surveillance* (Vol. 17). Washington, DC: Carnegie Endowment for International Peace.

Furman, J., & Seamans, R. (2019). AI and the Economy. *Innovation policy and the economy*, *19*(1), 161-191.

Guo, M. Advantages And Disadvantages Of Artificial Intelligence In Business English Teaching.

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education. *Boston: Center for Curriculum Redesign*.

intelligence, 1, 270-299

Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine. *Gastrointestinal endoscopy*, *92*(4), 807-812.

Khanzode, K. C. A., &Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Kok, J. N., Boers, E. J., Kosters, W. A., Van der Putten, P., & Poel, M. (2009).

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

McCarthy, J. (2007). What is artificial intelligence?

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In *Conference: Bilingual International. Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi*.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Nguyen, M. T., Truong, L. H., & Le, T. T. (2021). Video surveillance processing algorithms utilizing artificial intelligent (AI) for unmanned autonomous vehicles (UAVs). *MethodsX*, *8*, 101472.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Tizhoosh, H. R., &Pantanowitz, L. (2018). Artificial intelligence and digital pathology: challenges and opportunities. Journal of pathology informatics, 9.

Viscaino, M., Bustos, J. T., Muñoz, P., Cheein, C. A., &Cheein, F. A. (2021). Artificial intelligence for the early detection of colorectal cancer: A comprehensive review of its advantages and misconceptions. *World Journal of Gastroenterology*, *27*(38), 6399.

Walczak, S. (2018). Artificial neural networks. In *Encyclopedia of Information Science and Technology, Fourth Edition* (pp. 120-131). IGI Global.

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. *Materials Horizons*, *2*(2), 140-156.

Zhao, Y., Li, T., Zhang, X., & Zhang, C. (2019). Artificial intelligence-based fault detection and diagnosis methods for building energy systems: Advantages, challenges and the future. *Renewable and Sustainable Energy Reviews*, *109*, 85-101.

ARTIFICIAL INTELLIGENCE IN EDUCATION AND MACHINE LEARNING

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Abstract

This paper reviews the research on artificial intelligence in education and machine learning and how AI can help in building a model which would create the best learning environment for students and would create a resonance between students and teachers. It addresses affective strategies that promote quality learning and how to provide best way of education to teachers.
Keywords: ITS (Intelligent Tutoring Systems), machine learning, holo study, e-learning, personalization

Introduction

Nowadays, "Artificial intelligence" has a great importance in every field like online shopping, education, and many other areas of everyday life. AI (Artificial Intelligence) is the study of man-made computational systems, devices and intelligent agents. The main of AI in education is to create virtual environment for learning. AI is designed to include speech recognition, learning, problem solving and all of these are major challenges in education. Thus, AI systems have a lot of benefits like one is personalization i.e. it is quite easy to recognize the individual learning related requirements of a student. It is not possible by a teacher to provide meaningful feedback to each and every student, so AI will help the teachers in this way so that they can recognize the flaws and strengths of the students using machine learning. Machine Learning is a field that uses techniques the give computer the ability to "learn" with data using studies like pattern recognition and computational learning theory in artificial intelligence. Machine learning in education can be used to divide teachers and students in group according to the needs and availability of students. In ML(Machine Learning) has major categorisation in classification in which inputs are divided in to two or more classes and some others are regression and clustering act as the major applications of the machine learning. The scope of machine learning only keeps increasing. There are plenty of ways machine is learning in education in getting better; some of them are so instrumental in education that we probably couldn't live without them. I characterize the past, present and the near future of AI in education research in terms of combination of different roles played by constituents of educational processes. Machine learning is a core part of AI. Learning without any kind of supervision requires ability to identify problems and patterns in stream of inputs provided. I think that there is no way that going online completely is going to solve all all the problems now, however when combined with school curriculums and programmes can be used as a powerful tool. Hence, human factor would always have importance and AI would not replace it every time.I can only hope that some readers will be willing to give counter arguments on my research and that a result could emerge from any ensuing debate.

Literature Review

[1]Technologies are slowly changing the practice of research and education. This paper discusses how work in AI (Artificial Intelligence) is contributing new ideas towards education and learning.

The main aim of this paper is to review the past and present trends in the application of AI in education and to find from the failures and successes of past applications to possible future applications. Discussion of this paper includes the two main applications of AI in education: intelligent tutoring system (ITS) and micro words. We also discuss other research to support general points but many outstanding systems and studies are mentioned only in passing or not at all. It will be also considering the implications of AI in education of the changes that will be coming over the next few years. The effects will be at least significant to the society as the renaissance, the industrial revolution, and the invention of the printing press put together.[2] Intelligent Tutoring Systems: To reduce human teacher efforts a computer system was built which aims to provide personalized and immediate instructions to students. We began by reviewing the fundamentals of this behind these systems and illustrating them to tutors we have developed. ITS systems begins by comparing the student model and the content model i,e it basically begins by identifying what knowledge student already has through an assessment and then updating student model's status as instruction occurs.ITS has not grown upto its full potential. ITS can also teach despite of lack of visibility of ITS in the real world. Researches havce been made that ITS can replace over traditional classroom teaching and can provide many benefits of a human teacher to a very large scale of students. There are various applications of ITS which includes language processing, planning, multi agent systems, machine learning .Present computer instructions archetypes like e-learning provides an excellent platform for ITS .In the last several years applications of AI in education has diversified and the field is not certainly as unified as five years ago when ITS dominated AI research in education. Some recent research attempts to improve one on one tutoring method of teaching associated with ITS, other researchers are investigating different methods of teaching and learning. [3]Artificial intelligence includes e-learning. A research has been done to develop an artificial intelligence in education system (AIed) that is able to detect and then appropriately react to an effective state of a learner; one of the such research was cherer's effect framework. We chose to utilize cherer's effect framework as a way to integrate the research findings.[4] AI also helps students to practice the different or situations or scenarios anywhere and anytime and with the help of their teachers it can provide a serious training bottleneck. It also helps student to get a three dimensional, interactive and a simulated environment which increases their leaning power including their skills.AI in education is practice of building computational models of a school curriculum for a particular subject such as maths. A model of learners that would record how learners interacted with AI and Ed software and use that recording to make predictions about how that child is progressing.[5]The AI and Ed system through a piece of software and an interface, which could be a screen based interface or it could be something slightly different, would interact with the learner and take them down the most optimal path to improve their learning outcomes.[6]One type of such system is Holostudy. Holostudy is an application for the Microsoft halogens that anyone can use to gain the cumulative knowledge of mankind. Holograms can simplify studying complicated subjects like study of atoms and their connections, complex working of human organs or explaining physical and chemical phenomena. Holostudy will make knowledge easier to grasp and more enjoyable which will improve the quality and quantity of specialists making positive change in the world. [7]AI can also help teachers. AI can manage some of the tasks as well as it can communicate with students. With more interaction the AI can understand the strength and weakness of every student and help them work efficiently by building a curriculum and schedule that is suitable for the student. It will be more convenient to take help from AI to reinforce a skill or master idea before an assessment. In this way students will get

additional support from AI and will understands topics more deeply and will be able to apply it more effectively. [8]As different students have different capabilities, AI will provide different solution for different students. This will help the students to tackle problems in a way the find easy. As AI can focus on the skill sets on different students more effectively, it can provide the students with helpful feedbacks and can help them improve in the areas where they lack. [9]As far as education is concerned, practical knowledge plays an important role in it. With the help of AI we can improve this practical knowledge. Before making a real working model, we can make an virtual model 3D of it by use of AI. By this we will save a lot of labour and we can fix or change anything easily instead of starting it from the beginning. We can also monitor its working and see if it is providing the optimal results. By this it will be easier for the students to understand the working of a machine or a model. [10] Machine learning technology can help teachers to evaluate or assess tests objectively and provide feedback accordingly to the students. The applications of the machine learning included doing the assessment of the student and providing the scores. Machine learning can potentially redefined not only how education is delivered but also improves the quality learning on the students part. Machine learning can help in delivering customised in class teaching by providing real time feedback based on individual student requirements and behaviour. It also plays important roles in assessments or evaluation by removing biased grading.

Findings

Machine learning will be able to explain the concepts as well as set the goals for individual students. It considers the individual student aptitude, learning speed, background and give students an appropriate feedback on how they should grow their practical knowledge and improve his or her thinking skills. It processes the data in real time and provides feed to the teacher so that the teacher can recognize flagging student attention or poor response immediately and take corrective actions. A model of AI can be built which can potentially improve student participation and explain concepts and set goals for students. Based on the feedback, professors can change or modify the methodology of teaching, curriculum and topics accordingly.

Conclusions

There has been a significant rise in the field of AI in education and machine learning. Hence, it is difficult to neglect its role in future guided by the manner in which schools and universities will change their curriculum. The past and present use of learning management systems and intelligent tutoring systems has made prolific changes in the field of AI in education. Nowadays quality education is the most needed which somewhat cannot be fulfilled only by the teachers, so with the help of AI significant changes can be made in field of education thus the teaching practises followed in all the fields of education will be replaced in future by implementing the complex algorithms of AI designed by programmers . There is a urgent need for the universities and schools to rethink their functioning and pedagogical models and their future relations with AI solutions and their owners. We consider that there is a prerequisite for research based on the ethical implications of the current control to support the developments in AI. Using machine learning methods such as regression and clustering, we can create the best model of AI which would help in education.

References

Blanchard, E. G., Volfson, B., Hong, Y. J., & Lajoie, S. P. (2009, July). Affective artificial intelligence in education: From detection to adaptation. In AIED (Vol. 2009, pp. 81-88).

Devedžić, V. (2004). Web intelligence and artificial intelligence in education. Educational technology & society, 7(4), 29-39.

Freedman, R., Ali, S. S., & McRoy, S. (2000). Links: what is an intelligent tutoring system?. intelligence, 11(3), 15-16.

Jones, M. (1985). Applications of artificial intelligence within education. Computers & mathematics with applications, 11(5), 517-526.

Larreamendy-Joerns, J., & Leinhardt, G. (2006). Going the distance with online education. Review of educational research, 76(4), 567-605.

Looi, C. K., Mc Calla, G., & Bredeweg, B. (Eds.). (2005). Artificial intelligence in education: supporting learning through intelligent and socially informed technology (Vol. 125). IOS Press.

Mc Calla, G. (2000). The fragmentation of culture, learning, teaching and technology: implications for the artificial intelligence in education research agenda in 2010. International Journal of Artificial Intelligence in Education, 11(2), 177-196.

Timms, M. J. (2016). Letting artificial intelligence in education out of the box: educational cobots and smart classrooms. International Journal of Artificial Intelligence in Education, 26(2), 701-712.

Wenger, E. (2014). Artificial intelligence and tutoring systems: computational and cognitive approaches to the communication of knowledge. Morgan Kaufmann.

Yazdani, M., & Lawler, R. W. (1986). Artificial intelligence and education: An overview. Instructional Science, 14(3-4), 197-206.

KNOWLEDGE ON ARTIFICIAL INTELLIGENCE

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Introduction

You may heard that how fast and rapidly the technology on Artificial Intelligence is growing and in what ways the Artificial Intelligence is influencing the peoples lives and how crucial role it is playing now-a-days in our lives. Artificial Intelligence is spread over many industries like Software companies, hospitals, hotels and many leading industries. It is very useful to the development of any country. In this we will discuss about what is Artificial Intelligence and how far it is going and what types of industries are involving and how the AI is spread and at what stage it was formed and established and how long it went. In a nutshell, AI has had a transformative year. In any other year, Cambridge Analytica's attempt to sway national elections in the United States and the United Kingdom by exploiting social media data and algorithmic ad targeting would have been the most prominent news.

What is Artificial Intelligence?

[1]Artificial intelligence is the part of engineering which is used to build Intelligent machines mainly computer programs. It is nothing but using human brains and building a professional program which is so complicated using computer simply. [2] It is arrived due to military, finance, manufacturing sectors are growing as they can't run with only human brains, but also requires the mixture of human brain along with computers. Now it is one of the leading technology in the world. The multidisciplinary character of AI is another reason for the difficulty in defining it. Anthropologists, biologists, computer scientists, philosophers, psychologists, and neuroscientists all contribute to AI, each with their own viewpoint and vocabulary.

History of AI?

[3] Firstly, AI isan imagination, fiction. After development in engineering and electronics AI has been eventually evolved. By combing both the electronics and AI they found that many developments can be established in the future and they tried to get knowledge on it. [4] In 1847 George Boole described the formal language for logic reasoning. John McCarthy first time gave a definition for Artificial intelligence in 1956. From then the world has changed and eventually stared Artificial Intelligence in lives. According to computer scientist Nils Nils son, the purpose of artificial intelligence is to "make computers intelligent" by automating or replicating behaviour that "enables an entity to act effectively and with foresight in its environment."

Growth of AI?

[5] Now a days AI is eventually growing too heights and heights. Without AI there would be many things stopped and the there may be economy fall. AI is the technology of future. It is started on lya years ago. So there is a major development which helps the people and country.[6] Due to revolution of AI the employment offers increased and there is a growth in employment. It can replace labour by capital in production of goods and services which is very useful for the leading industries and industrialists.

AI in Healthcare Appliances?

[7] Due to AI the medical industries also increased a lot. Many sophisticated operations and treatmentsareevolvingduetoAIwithease.Itishelpfulinrecoveryoftreatmentlikecancer, neurology and cardiology. [8] AI is used to determine the disease more accurately by x-rays, MRI, CT scans, and ultrasounds and helps the patient to reduce the recovery time from weeks to hours. This made life easier and safer than earlier and people started to believe in it and tried to implement more practices. [9] Coming to dentists AI is used to build the 3D image of problem of the patient and helps to find the outcome. Cone beam computed tomography (CBCT) and intraoral/facial scans are some of the methods to find AI based 3Dimages.

AI in Manufacturing and Production?

[10]In recent times. AI in manufacturing industry is growing rapidly. It helps in charge ofmodels, means and ecosystems with information communications, manufacturing, and related product technology. [11] After arrival of AI the production in manufacturing industries increased compared to before. The goods are also not satisfied customers before the arrival of AI. Because with the help ofpeople there may be many mistakes and there may be faults in the goods. But the computers never make mistakes. It eventually increased the quality and productivity. [12] Bills of Materials(BOMs) and routings which is developed by artificial intelligence inventory items that show all sub-assemblies and raw materials. The present advancement in intelligent manufacturing is also covered from the perspectives of intelligent manufacturing application technology, industry, and application demonstration. Finally, recommendations for using AI in China's intelligent manufacturing aremade.

AI in Security and Surveillance?

[13] AI as an integrated system that incorporates information acquisition objectives, logical reasoning principles, and self-correction capacities. The software is completely secured by firewalls by which the data can't be stolen by scammers. [14] Security plays a key-role in many organisations in keeping their data safe from many threats. AI is playing a key-role in keeping the data safe by providing many security issues. In terms of ambient data and connection, code-driven systems now reach more than half of the world's population, presenting previously unimagined potential as well as unexpected risks. Artificial Intelligence (AI) is evolving at a rapid pace, particularly in industrial construction. The unusual use of AI in cyber-attacks appears to be rather frightening. [15] The detecting of many issues in computers and using off cameras and videos are all based on AI. They detect the information if anything goes wrong other than the operator stores in it and alerts the public. This AI helps the people to be safe and make the polices easy to track the thieves or any misleading issues.

AI in Education?

[16] Education through computers are being used since 20 years. Computer-based training(CBT) and Computer Aided Instruction(CAI) are some of the practices used to learn through computers. This is the interesting thing where the major change occurs through AI. There is more change in education in terms of effective teaching skills using AI to plot a graph or a 3D diagram which helps to understand the concepts easily for the students. [17] There are also some consequences of AI in education like the bond between teacher and student is breaking with this which is very bad. Teacher plays an important role in guiding students, So there is a misguide with AI ineducation. [18] In

education AI plays a major role in mathematics and problem solving. They help toanalyse the problem and solve it easily in no time. Artificial intelligence (AI) is becoming more and more prevalent in our daily lives. For example, AI researchers are presently leveraging new methodologies in machine learning, computer modelling, and probability statistics to improve financial decision-making, as well as leveraging decision theory and neuroscience to drive the creation of more effective medical diagnostics.

Advantages of AI?

[19] It is used to solve the problems easily which reduces most of the time. It increases the effectiveness of the work we are doing. AI provides the advantages of reliability, permanency. Artificial intelligence is well-exemplified by smart phones. With apps like Siri, which acts as a personal assistant, maps and GPS, which show the user the shortest routes to their destination, and apps that forecast the user's activities and provider ecommendations [20] A new product is developing in the form of projects now a days. Projects need a team work and have to make many complex tasks to build it. AI helps to make it easy and make those complex things to simple and also reduces the people inwork. [21] AI helps the machine to think and understand a situation and work and helps it to analyse like a human being. The utmost precision and nearly no probability of error are achieved when AI isused. [22] Now a days neural networks are used by mathematicians and scientists to solve a complex equation or a problem in seconds which is controlled by AI. Artificial Intelligence-enabledrobots could be employed to investigate the depths of the earth and the world's oceans in order to obtain the fuel and resources that humans require. [23] AI is also used along with electrical automation control now a days more and more. With this type of combining technologies there is more chance to develop easily. When performing repetitive and time-consuming jobs, artificial intelligence can be useful.

Challenges or disadvantages of AI?

[24] Mainly in education there are disadvantages of using AI. It can't fulfil the role of a teacher in classrooms and causes many dangers to the children in a class. The cost of maintenance and repair is one of artificial intelligence's major drawbacks. To satisfy changing requirements, the software must be updated on a regular basis. The expense of repair in the case of a failure can be very costly.

[25] We draw many graphs and to measure and compare many things in form of graph. These graphs tells the data in a simple and easiest way and easy to analyse it which are drawn by AI. But these graphs can be changed by a other person or some unknown mainly in the process of voting there is a major chance to mislead the votes represented in graphs which are done by AI. So these things may cause major scams. So AI has the disadvantages of misleading the data easily. [26] Bugs are a major drawback. When giving artificial intelligence a large number of complex tasks, keep in mind that any computer can fail. A little arithmetic error can lead to a slew of subsequent issues. This can potentially result in the loss of critical data that is processed by a machine. [27] Social media mainly the news which is published in that are all controlled by AI. Thesenews are transferring very negatively in social media and many fake news is transferring through social media which may lead to the people threatening to the news. It will be catastrophic if military robots fall into the wrong hands. The machine does not pause to consider its actions before going in to action. [28] Now a days all the banking is through online which is run by AI. There is more scope to take the money and mislead the transactions and there is more chance to turn a person into culprit by doing scams in these online transactions which made them easy bu Artificial Intelligence

Conclusion

So, according to the above explanation we can understand that the life without AI wouldn't be this. AI has played major role in many important and use industries. Hospitals became easy to recover many dangerous diseases which can't be treated those days. Many diagnosed ways have been established in hospital sectors. We are using computers and huge machines to make our work more simple and easier and the productivity is also high. This is all because of the development of Artificial Intelligence only. AI systems were rapidly deployed into more social spheres this year, putting an increasing number of individuals at danger. While AI techniques still have a lot of potential, rushing to implement systems without proper assessment, accountability, and monitoring can be dangerous. We need to regulate AI systems on a sector-by-sector basis, with a focus on facial and affect recognition, and to base those policies on thorough research.

References

Aghion, P., Antonin, C., &Bunel, S. (2019). Artificial intelligence, growth andemployment: The role of policy. Economie et Statistique, 510(1),149-164.

Allen, R. J. (2001). Artificial intelligence and the evidentiary process: The challengesof formalism and computation. Artificial Intelligence and Law, 9(2),99-114.

Alzaidi,A.A.(2018). Impactofartificialintelligenceonperformanceofbankingindustryin Middle East. International Journal of Computer Science and Network Security, 18(10),140-148.

Beck, J., Stern, M., & Haugsjaa, E. (1996). Applications of AI in Education.*XRDS: Crossroads, The ACM Magazine for Students*, *3*(1),11-15.

Benko, A., &Lányi, C. S. (2009). History of artificial intelligence. In *Encyclopediaof Information Science and Technology, Second Edition* (pp. 1759-1762). IGI Global.

Buchanan, B. G. (2005). A(very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Chowdhury,M., & Sadek,A.W.(2012). Advantagesandlimitationsofartificialintelligence. Artificial intelligence applications to critical transportation issues, 6(3),360-375.

Cihon, P., Maas, M. M., & Kemp, L. (2020, February). Should artificial intelligence governance be centralised? Design lessons fromhistory.

Feldstein, S. (2019). *The global expansion of AI surveillance* (Vol. 17). Washington, DC: Carnegie Endowment for InternationalPeace.

Feng, H. (2018, September). The application of artificial intelligence in electrical automation control. In Journal of Physics: Conference Series (Vol. 1087, No. 6, p. 062008). IOPPublishing.

Furman, J., & Seamans, R. (2019). AI and the Economy. *Innovation policy and the economy*, *19*(1), 161-191.

Garrido, A. (2012). AI and mathematical education. Education Sciences, 2(1),22-32.

Guilherme,A.(2019). AIandeducation:theimportanceofteacherandstudentrelations.*AI & society*, *34*(1),47-54.

Hsu, Y., & Chaing, Y. H. (2021, July). The Strategic Advantages of ArtificialIntelligence System for Product Design Teams with Diverse Cross-Domain Knowledge. In International Conference on Human-Computer Interaction (pp. 408-419). Springer,Cham.

Hung, K., Yeung, A. W. K., Tanaka, R., & Bornstein, M. M. (2020). Current applications, opportunities, and limitations of AI for 3D imaging in dental research and practice. *International Journal of Environmental Research and Public Health*, *17*(12),4424.

In Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society (pp. 228-234).

Khan, M.M., Rizwan-ul-Hasan, S., Ahmed, A., Khan, M.A., & Fahad, M. (2020, February). AI Surveillance UGV. In *2020 Inte[rnational Conference on Information Science and Communication Technology (ICISCT)* (pp. 1-6).IEEE.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1),86-96.

McCarthy, J. (1998). What is artificial intelligence?.

Murali1, N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–areview.

Ozbay, F. A., & Alatas, B. (2020). Fake news detection within online social media using supervisedartificialintelligencealgorithms.PhysicaA:StatisticalMechanicsanditsApplications, 540, 123174.

Pande, G. N., & Shin, H. S. (2004, February). Artificial intelligence v. equations. In Proceedings of the Institution of Civil Engineers-Civil Engineering (Vol. 157, No. 1, pp. 39-42). Thomas TelfordLtd.

Rahim, S. M., Mohamad, Z. Z., Bakar, J. A., Mohsin, F. H., & Isa, N. M. (2018).Artificial intelligence, smart contract and islamic finance. Asian Social

Satpathy, S., Nandan Mohanty, S., Chatterjee, J. M., & Swain, A. (2021).Comprehensive Claims of AI for Healthcare Applications-Coherence Towards COVID-19. In *Applications of Artificial Intelligence in COVID-19* (pp. 3-18). Springer, Singapore. Science, 14(2), 145.

Smirnov,Y.(1999). Applying AI to Manufacturing Linear Order Promising and Production Planning. In The Workshop on E-Commerce, American Association for Artificial Intelligence Spring Symposium, Stanford.

Tao, B., Díaz, V., & Guerra, Y. (2019). Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher. Arctic Journal, 72(12),30-50.

Wan, J., Li, X., Dai, H. N., Kusiak, A., Martínez-García, M., & Li, D. (2020).Artificial- intelligence-driven customised manufacturing factory: key technologies, applications, and challenges. *Proceedings of the IEEE*, *109*(4),377-398.

Warwick, K. (2013). Artificial intelligence: the basics. Routledge.

Xu, S., & Hung, K. (2020, April). Development of an ai-based system for automatic detection and recognition of weapons in surveillance videos. In *2020 IEEE 10th Symposium on Computer Applications & Industrial Electronics (ISCAIE)* (pp. 48-52).IEEE.

WIRELESS POWER TRANSMISSION TECHNOLOGIES FOR WSNS AND CHARGING OF MOBILE DEVICES

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Abstract
Wireless charging is the charging of devices not attached to the power source by any physical means. Wireless charging provides a hassle free to charge mobile devices on the go and with advancement in technology could eliminate the need for batteries in mobile devices. In this paper we delve into various modes of power transmission both radiative and non- radiative and its implementation in mobile devices and WSNs. The advantages of wireless charging and the shortcomings of its implementation with existing technologies are also discussed.
Keywords: *Wireless charging, Radiative and Non-Radiative, Wireless Power Transmission (WPT), Wireless Sensor Networks (WSN)*

Introduction

In the past few decades there has been a huge increase in the development and an even increase in the usage of electronic devices such as laptops, phones and even toothbrushes. Due to this surge a sudden surge in wireless charging technology has surfaced.

Wireless charging is the charging of devices through any media that does not need a physical tether attached to the device and a power source. Wireless power transfer based on magnetic resonance and magnetic coupling was pioneered by Nikola Tesla more than 100 years ago. Power transfer can be both radiative and non-radiative based on the transfer mechanism used. Radiative transfer works on electromagnetic waves that transmit data over any media such as air or vacuum from antenna over a large distance. Non-radiative transfer works on the principle of magnetic coupling resonance as. This was the mechanism Nikola Tesla implemented in his discovery.

[1] Nowadays this technology is developing and being implemented in many devices almost any mobile handheld gadget one can think of can benefit from the easy access of wireless charging from application of wireless power transfer. When one compares the traditional wired charging, wireless charging poses numerous advantages such as

- Easier access to charging on the go whenever and wherever one goes
- No problems of wire damages and need to purchase a new one
- One can implement the concepts of turbo charging through wireless means
- Wireless charging can provide on demand requirement thus eliminating the requirement of batteries in many cases.
- We can control the amount of power transferred which cannot be done through normal wired charging means Some of the shortcomings of wireless power transfer is the high cost requirements as a power transfer device needs to be installed and the mobile device requires some receivers which need to be installed separately, also these generate a lot of heat which need some additional coolers.

WPT Technologies Current and Past

Nikola Tesla first envisioned the idea of wireless power transfer back in the early 20th century and nearly achieved this when he sent an electrical signal across the Atlantic Ocean. Nikola Tesla built what is considered the worlds first power transmission setup the Wardenclyffe tower in Long island, New York. But due to the large scale electro-magnetic fields involved the method was highly inefficient. Since then with the advent of mobile devices the interest in wireless power transfer has grown again.

The current WPT technologies can be broadly classified into 2 groups the radiative power transfer methods like EM radiations and the non-radiative like inductive coupling and magnetic coupling.

EM Waves Radiation

E.M waves transmit energy from the transmitter antenna of the power source to the receiver antenna of the device in the form of EM waves. E.M waves can be either unidirectional or omni directional based on the direction of propagation of the waves. Omnidirectional waves are made by using a special type of antenna called an omnidirectional antenna where it has an axis and the radio waves are propagated outward radially in a symmetric fashion. Both unidirectional and omnidirectional waves are used for different means and suffer setbacks of their own. Omnidirectional waves are suitable for transferring information, but it cannot be used over a long distance as EM waves dissipate energy over distance and time and decay also for the safety purposes omnidirectional waves are used only in low power nodes as high frequency waves having higher energy can pose a health risk for people. Unidirectional waves can transmit high power radiation over a long distance but can work only if a clear line of sight (LOS) is established. Microwaves or laser beams are usually used. One such application of this mode of transmission is the control of the unmanned aircraft SHARP (Stationary High-Altitude Relay Platform) designed by Canada's communication research centre. The SHARP could fly in circles of up to 2km and could fly for months at a time. However unidirectional waves cannot be used for charging mobile devices or WSNs as a few criteria have to be met for it to work such as the LOS and complicated tracking mechanisms.

Inductive Coupling

Inductive coupling works on the phenomena of magnetic induction i.e. when an alternating current is passed through a primary coil it creates varying magnetic fields that induce an EMF in the terminals of the secondary coil. Inductive coupling mechanism is used widely in everyday products such as wireless charging pads for mobile phones however inductive effect between coils decreases as we move away from the coil. For even a small distance the effect reduces due to this the transmitter node and the receiver node have to be close to each other and in a particular alignment for power transfer to take place. Because of these limitations inductive coupling is not suitable for charging WSN over a long distance. Research in inductive coupling has led to development of different mechanisms such as magnetic resonant coupling.

Magnetic Resonant Coupling

Magnetic resonant coupling is based on the evanescent waves which transfer energy between two oscillating or resonating magnetic coils. An evanescent wave is an oscillating electro-magnetic field that does not propagate as electro-magnetic radiation, butthe energy is spatially concentrated near the source. This is obtained by having resonant magnetic coils operate at the same resonant

frequency so that they are coupled by non-radiative magnetic resonance. Using this phenomenon high energy transfer can take place with minimal leakage due to dissipation. Magnetic resonant coupling can charge devices placed at slightly larger distances when compared to inductive coupling (in magnetic resonant coupling the receiving node and the transmitter node can be placed a few metres apart when compared to almost being in close contact in the case of inductive coupling) and more efficiently than omnidirectional EM waves and eliminates the LOS requirement for the unidirectional waves. Also, magnetic coupling resonance can be applied between one transmission resonator and many receiving resonators i.e. many receiving nodes can connect to a single source node in this mechanism. However, there are some shortcomings in this technique as well. Firstly, for the power transfer to work efficiently the nodes need to be aligned co-axially and when many numbers of nodes are connected to the source mutual inductance can take place between them and this can cause some interference.

Applications of WPT Technologies
Based on the range of the aforementioned techniques for wireless power transfer we can classify them as near field or far field charging.

Far field charging can be achieved through either omnidirectional EM waves or unidirectional EM waves. For unidirectional waves only one receiving node can be connected to the source node and a dedicated LOS has to be established first, but it can achieve high power transfer with good efficiency over a long distance even in the range of kilometres with little dissipation of energy. For example, as mentioned earlier the unmanned aircraft SHARP could be controlled and could even move in circle of diameter nearly 2km other unmanned aircrafts such as Raytheon Airborne Microwave platform (RAMP) and High=-Altitude electric motor Power Platform (HAPP) have also been developed using this technology. Microwave and laser beaming techniques used to transfer power in the range of kilowatt over long distance have been in development since the 1960's.[7]Omnidirectional EM waves can operate without a LOS and also and is less sensitive to the orientation if the two nodes, however it has a lesser range than the unidirectional waves and also has lower efficiency. Wireless charging for WSNs have become the most widely used applications for this technique. Experiments on using this technology for battery less devices have been conducted with positive results as in reports. Omnidirectional wave based sensors have also been used in Internet of Things (IoT) and Machine to Machine communication (M2M) systems.

Near Field Charging
Near field charging can achieved by applying inductive coupling or magnetic resonance coupling effects. Most existing WPT system are based on the inductive effect mainly because of its safe implementation and its easy setup and access. Inductive power transfer also allows the transfer of high power with comparatively higher efficiency than radio frequency EM waves. Due to these factors it is used widely in the automation industry. Its major applications are in induction generators, small scale and large robots, electric railway trains. It also sees a rapid development in the bio-medical sector for bio-medical implants.

Advantages and Disadvantages
The advantages of WPT are that it can provide a hassle-free way of charging mobile devices, because of this it saves time as the devices that require to be charged can be done so while they are

in use. There is also less wastage of energy by dissipation due to internal resistances in the wires used for charging.

There a few disadvantages of wireless charging along with the advantages. The high cost of implementation is one of them. Network traffic in case of many nodes may cause interference during the charging process/ the rate of charging may not be as high as compared to tethered charging as there is not advancement in this field yet. Also, the radiations used for transfer may cause some effects to the human body

Findings

Many different technologies exist for transmission of power wirelessly. They are inductive coupling, EM waves and magnetic resonance coupling which can be used for near field and far-field charging depending on their need and range required. All of them have their own advantages and disadvantages and their own uses. However, with current technology it isn't completely possible to implement these technologies into all mobile devices so as to completely eliminate the need for batteries.

Conclusion

In this modern era, one does not have the time to always tether one's mobile device for charging all the time. The different technologies provide a promising way to make charging of devices easy and could even eliminate the need for batteries in the future.

In this paper the concept of WPT and its various techniques are presented. Also, the various advantages and disadvantages of it were also discussed. A comparative study of each technique and their advantages over each other and their shortcomings were also presented. The technology we currently posses is not sufficient for every gadget and more developments in current technology needs to be done for it to work on all gadgets.

References

Cook, N. P., Sieber, L., & Widmer, H. (2014). *U.S. Patent No. 8,901,880*. Washington, DC: U.S. Patent and Trademark Office.

Hui, S. Y. (2013). Planar wireless charging technology for portable electronic products and Qi. *Proceedings of the IEEE*, *101*(6), 1290-1301.

Juneja, P., & Chaudhary, R. K. Wireless Mobile Charging.

Kaur, H. (2016). Comparative Study of Wireless Charging Mobile Phone Techniques.

Lu, X., Wang, P., Niyato, D., Kim, D. I., & Han, Z. (2016). Wireless charging technologies: Fundamentals, standards, and network applications. *IEEE Communications Surveys & Tutorials*, *18*(2), 1413-1452.

Mohammed, S. S., Ramasamy, K., & Shanmuganantham, T. (2010). Wireless power transmission–a next generation power transmission system. *International Journal of Computer Applications*, *1*(13), 100-103.

Sayyad, A. J., & Sarvade, N. P. (2014). Wireless Power Transmission for Charging Mobiles. *International Journal of Engineering Trends and Technology (IJETT)–Volume*, *12*, 331-336.

Vikash Mishra, Lavya Nigam , Anand Mohan "Wireless Power Transmission" International Journal of Emerging Technology and Advanced Engineering Website: www.ijetae.com (ISSN 2250-2459,ISO 9001:2008 Certified Journal,Volume 4, Issue 2, February 2014)

Waffenschmidt, E. (2011, October). Wireless power for mobile devices. In *Telecommunications Energy Conference (INTELEC), 2011 IEEE 33rd International* (pp. 1-9). IEEE.

Xie, L., Shi, Y., Hou, Y. T., & Lou, A. (2013). Wireless power transfer and applications to sensor networks. *IEEE Wireless Communications*, *20*(4), 140-145.

PROCESS AND PROGRESS OF ARTIFICIAL INTELLIGENCE

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What is Artificial Intelligence?

[1] It is defined as usage of artificial object like computer or any other machine to work with complex issue or problems. It is combination of physiology intelligence and a part of computer science, in computer sense, it isa ability of being reaching goals in world. It's Intelligence is capacity to Understand, think, imagine, memorizing taking choices and decisions from experiences. It is generally helps us to developing and advancing machines as if it do jobs of humans much more like humans and do all it in lesser time. So it is called as an Artificial Intelligence. Based on Philosophy of Artificial Intelligence it is divided into Strong AI and Weak AI. [2] Artificial engineering it is generally a way of constructing intelligent machines or like intelligent computer programs.it also refer to understand human intelligence by computers. But biological explanations or observations are not defined. [3] John McCarthy father of Artificial Intelligence said that engineering and a computer science knowledge to build a intelligent machines which work automatic for use of human and revolution . It even use logics and computer program in devices for automatic work of machines and it is used in biological applications, mathematical laws, and mechanical engineering. It depend on 4 categories like self awareness, reactive machines, theory of mind, limited memory.

History of Artificial Intelligence?

[4] At earlier, aspects like philosophy, tale and even imagination sketch a word called 'Artificial Intelligence'. And even many discoveries in electronics, aspects of engineering took a steppingstone for artificial intelligence, and this make an achievement like solving problems which leads to understand and analyse something new, exploring ourselves, and conclude and demonstrating programs which make skill in language , translating ,proving some theorem ,align ourselves with skills which build up a knowledge.[5] The two publisher named Peter Norvig and other man called Stuart Russel in the paper which published by them have suggested some ideas about artificial intelligence .on 1950 'Artificial intelligence' term is coined by John McCarthy, and thereby on year 1958 he invents LISP program. Hence the father of Artificial Intelligence is John McCarthy. George F Ludger explained about plan and policies of AI. Supervised type of machine learning has been described by Niklas Lavesson.[6] The history of Artificial Intelligence is started in 1956 when John McCarty told a term which is contributed to his subject in the conference in New Hampshire (Dartmouth college) .Actually the initial aim was to ambitious and does not proposed for what it actually told it will. Between 1960s and 1970s the Artificial Intelligence generally focussed on (expert system) or KBS. Expert systems are mainly focussed on medical diagnosis to molecular structure.

Growth of Artificial Intelligence?

[7]With development of internet, e-commerce, sensors and big data platform for information community, and even cyberspace AI has profoundly changed to new : AI 2.0 .this development

leads in creating New models: Internet Based, collaboration which helps in production and providing jobs in services for users. New means: smart manufacturing integrating human-machine, flexibility and virtualization. New form: intelligent manufacturing like ubiquitous interconnection, innovating in mass, cross-border integration. This new models, forms, and means are ultimate growth of Artificial Intelligence. [8] The ,4th industrial revolution is Artificial Intelligence. By using big data platform it transformed all industries around whole world. Basis of 'computer system which programmed 'help us to solve more precisely and technically the real -word problems than 'computer system'. Many related Business related issues cannot be solved by deterministic approach in that circumstances Artificial Intelligence plays a key role. AI helps us to tackle problem which actually difficult in Business(recommend products, some marketing finding fraud in cards, insurance issues, and all other) by actual determined computer

Applications of AI in Healthcare?

[9]Generally, in health care most important of traditional machine studying is foretell some precise medicine, treatment should be given to succeed in treatment it is just called a Supervised learning. But later comes a complex part called Neutral network or as deep learning it is established since 1960s in healthcare field for 3 decades it help identifying whether a patient has, or will acquire certain disease or their symptoms. In deep learning they focuses in viewing images that is seen beyond that which cannot be perceived by naked eyes.Nowadays, most hospitals not following any manually noting and storing data, instead they start for Electronic health records(EHR) .AI generally important process for improving documentation is 'voice recognition'. Generally AI provides many ways and approach for patient safety and provide them a affordable care through there work. It also work to enhance persons experience.[10]It generally enlarge opportunity in healthcare like generally many underdeveloped and developing countries no medical practitioner to help someone from undergoing unfair treatment.in such cases AI offer machines to do. Like performing x-rays to treat for tuberculosis. It works to improves the standard of services like AI help in Time management. Equipment which perform some healthcare facilities compared to humans which give a sufficient extra time. These helps in treatment and detection hence misdiagnosis are reduced. It focuses in advances Immunotherapy for cancer patients to get treated.it is way that help in identifying , visualizing and curing way for cancer. Artificial Intelligence improves the quality of services, many countries lack therapist and physicians for proper treatment hence AI uses of machines for diagnostics, Using X-rays, CT, MRI help in detecting in lesser time. [11]AI is extremely encouraging and developing hope even though it doesn't cure all. It helps to identify and recognise and cure most of the patient with sufficient medicine and help them to live a self-reliant life .and also to get the life of the harnessing one to comfort zone with specific medicine.

AI in Manufacturing and Production?

[12] In this work Artificial intelligence describe in the way of (PdM) Predictive maintenance for manufacturing. PdM generally refer to ability of saving money by reducing and forecasting machine Breakdown, in these instance we generally refer how generalised will appear with real production data. We created and accessed a machine learning model which depend on well organised boosting resolution to find errors or any failures.[13] Today, AI combined with recent advance in web ,and Semantic web-jointly defined as Semantic Web of things, It is to very important role in industry 4.0.Due to this authors generally called it as industry 4.0 as a Semantic Web of Things (SWeTI).[14]

Artificial Intelligence if we analyse it is developing rapidly in some new 'Internet plus' which in turn leads in innovating new models ,some ecosystem in industry ,ideas in architecture, manufacturing in technology, to combine AI in technology and all other ecosystem. [15] In Intelligent Manufacturing (IM) is considered as a latest version of Smart Manufacturing (SM) it will tell about technologies (Smart) such as (IoT) Internet of Things, System like Cyber, Big Data is considered under Industry 4.0. Artificial Intelligence (1.0) is defined as contents which is structured and centralised and later it modified and evolved into Artificial Intelligence (2.0) is defined as a contents which are unstructured and they are decentralised it is generally deep learning it just explain us how Intelligent manufacturing (IM) accept Artificial Intelligence (1.0) to get modifies Smart Manufacturing (SM) by Artificial Intelligence (2.0).

Security and Surveillance of AI?

[16] AI is helps in providing a paramount importance in security and surveillance one such is maritime surveillance in which focus monitor of fisheries (production, Decline),migratory activity, national security policy. Radars and ALS does not cover the enter maritime sensorshence Space-based sensors are crucial instead. [17]Security and Surveillance are very important to treat human life and their property . The idea of using lock-key for door now modified in way in which we start to use of cameras, alarms and sensors. Surveillance in AI is task in which monitoring and inspecting a person or some other gadget just to prevent or lower the risk of undesired threatening and hazardous in order to support normalcy. Even though there is lack of well-trained labour force and workforce. The growth of the communication and other technology(ICT) gave rise to increase in automation which is part of application of surveillance. This had made to decrease in human action and system is well developed to be valid and authentic. Automation have made between Internet of Things (IoT) and Artificial Intelligence is suitable and made more efficient. [18]Security and Surveillance with help of cameras and video are well advanced and very useful for safety for public. Due to limited labours for security so might result in undetect so many risk and dangerous. So that they decides to solve this by developing real time solutions. The goal to enhance a low-cost, very well organised, and a artificial-related solutions, and to identify the tools used on different videos for various situation. It can be done by TensorFlow.[19] Safety and protection for any sort of physical threat is just given by Security and Surveillance. Changes in Infrastructure of network may cause when there is Surveillance video installation and may affect the budget(financial). The main motive for Surveillance system. When we install any cameras(CCTV) in (UGV) unmanned ground vehicle it is move by itself to any geographic locations of it's own, by choosing the direction system. Analog Transmission is the way in which we can control (UGV) unmanned ground vehiclewithin the particular ranges. We can view a video anywhere by any computer devices using Analog. The video is board cast through (Analog) video transmitter and it get by through (Analog) video collector and can be noticed by software which is developed. In the ground control system the developed software can by easily notice the smart employee using a model which is deep in learning which is actually trained for a employee.[20] For protection and security of smaller areas monitoring and urban surveillance is very important. The safety of Urban civilisation is important due to Warfare of 'Gray zone' they use many methods for disturbing the services and mislead them by giving wrong information.

Artificial Intelligence in Education?

[20]AI provides long term goals in learning(which are long and wide),it access for worldwide classroom, studying skills of twenty first century, for every student it associate with mentor, providing a major infrastructural support, interlinking data with support in teaching.[21]Nowadays, Education in Artificial intelligence became aimportant trend exists there is a constant rise in AIEd (Artificial Intelligence in Education),small works have been managed for bringing intense learning, AI which is Traditional is commonly used but modern AI is rarely used, the absence of education even has a job in AI technologies and engage in education. AI digital technology enhance a important role of making something what we thought, react based on these and also investigate further on these.[22]In education if we apply AI it give a way to human learning, on before when IT with AI in education many more technologies are created which make students to learn and maintain a environment and teachers to educate this example is e-learning or ITS. e-learning is educational based system which uses online along with web technology. ITS is result of beginning state of the AI.in this, models set for learners are called learners models and in based on data technology called analytics of learning is developed.it is usually analyzed by historical data of the learners(e-learning) Today the important achievement in AI is machine learning.[23] Artificial Intelligence is considered as well founded in education for 15 years, Many new learners and educating people are using it's applications, most popular application is Robotics, For the purpose of education the Lego Mind Storms kits are developed in MIT lab on 1980s. there are some robots which help in learning students and learners are Ozobot and other is Cubelets. [24] Artificial Intelligence are empowered mostly education 4.0.In this they meant for an innovative approach and the first is along with Artificial Intelligence they associate a process of high educational which help of sensors (small) and devices (wearable) for regulating (self) learning. And secondly Education 4.0 focused in didactic methods directing with analytics of learning and also machine based algorithm learning. The main goal of these program is to judge the marks of the students before final examination. They mainly focuses in Recognition system (early)for capturing data with include their study course and even as personalized (their character) at the earlier of the semester, and then Auto tutor By N.A.Crowder theory with adaptive learning and adaptive feedback assessment . FromThis , it clearly focuses for students and educationalist which help nourishing them in studies and taste the fruits of success.[25] AIED (Artificial Intelligence in Education) is came forward to teach with computers and pads and it make both students and teachers to explore into new ways and to make students understand more effectively.it ways not only helps in education but also in business affairs or even in personal uses. The technologies which were designed (Learning and teaching) with Artificial Intelligence in Education (AIED) Make promote and boosted in robotics and also use of sensors which help in detect our surrounding.It says Schools a place in which all come for learning which exists for 25 years where teachers came forward to teach Students.There will teachers who assist for education in Collaborative Robots (cobots) in classrooms of tomorrow and telling works of today about robotics. It also visualizes smart classes with help of sensors to hold up in learning and to make new ways with Artificial Intelligence in EducationAIED).[26]Artificial Intelligence and education together held 2nd International conference in September 1985 in United Kingdom (Exeter University). Intelligent Tutoring System find their origin in Computer Assisted Technologies. There are two primary approach in Artificial Intelligence (AI) in Education with use of computer is Intelligent Tutoring System (ITS) by Sleeman and Brown in 1982 and Computer Based Learning Environment by Papert in 1980 and Lawler in 1984. The advancing of either Intelligent Tutoring System (ITS) or Computer Assisted Instruction (CAI) use the methods of representation of Knowledge with Community of Knowledge Engineering

Advantages of Artificial Intelligence?

[27] AI is generally layout as an everlasting, authentic or well founded and economical(modest).It focuses on various branches like in medicine, engineering, and diverse in modelling, predicting, help in decision making, even in manufacturing, economics, law and linguistics. And in dynamic use of net in searching for machines and engines, and also in advance and lead in transportation system.[28]It function is generally unlimited, it help in finding unexplored things, it help in finishing a project much before human do, it helps in tough and hard work ,it make less error and detects, Efficient works can be finished in short span of time, there is high Success ratio, Various function will be done in fixed time. [29]The main impact is AI is depend on facts neither on sentiments nor in emotions, It is not affected by any negative impact as human usually undergo. It doesn't sleep as humans undergo as a disadvantage as result of tiredness, It helps in easier spreading of knowledge, When we train something for an Artificial mind , then it will be easy to copy or to teach something for others through training because it helps in saving in time. It further focused on the plan of multi-task program. [30]In Business AI main motive is to focuses on features, their functions and products performance, and it also focuses in taking right decision, making new products, To take supreme internal operations in Business, To carry on new markets, To take on and use scare knowledge in place where it used. Even to optimize external process like sale and marketing of new products. And even use Automation for reducing head count. [31]The basic need of AI is motivated by a idea that new beginner in AI should require at least an understanding in Literature of AI, Major rise in interest of AI lead to increase interest and large investment.[32] Artificial Intelligence can de established easily. Artificial Intelligence can be widely distributed in branches of industries and also in companies. Humans could feel he is loaded with a many activity of programming by own ,and self noting and also self-evaluating. Artificial Intelligence is considered as a low-priced labor in which our tasks are finished quickly and our yield will be more.In excavate(mining) and fuel inspecting process we could establish the knowledge of Artificial Intelligence and robotics in order to save human life. Because we could construct other robots but could not make other human life.[33]Artificial Intelligence are very useful in lessening the error and also help in greater precise which is near accuracy. Physicians will judge patients and health issues with help of Artificial Intelligence. Frauds can be detected by system called smart card basis. Important applications of Artificial Intelligence is Radio Surgery. When we go for longer trip with help of GPS. [34] The advantages of Artificial Intelligence is to Reduce Error it focuses to get accuracy (precise which is near to high degree of Accuracy) and help to reduce errors. It helps in Physicians , banking and even in airline departments and even in many other departments, the physicians name Jiang Jiang Zhi in 2017 believe that Artificial Intelligence not only help doctors to get better decision on clinical departments but also can be used in radiology department instead of human idea. Even in banks it help to error and to minimize fraud, theft, cyber and all other. And in University college of London Haitham Boamar and peter Bentley Invented Autopilot AI which majorly help in reducing errors may caused due to overload, And other advantage is multitasking tasks are just divided into routine & non-routine. By use of machine Intelligence we could perform our Repetitive task. As we know Machine do faster anything before human do that may lead to do multitask Example: To spam out E-mail using Neutral Networks. Other advantage is work for longer hours As machines (With artificial Intelligence) can work for long hours than human can do .Soon after Artificial Intelligence could soon became for experience for dining for taking order, Preparing meals and to even deliver. From fast food deliver to provide Non-stop service to customer is a digital innovation capability.

Disadvantages in AI?

[35]It might corrupt our rising generations, it will lead in deficiency and scarcity in human knowledge(touch), it will go wrong and opposite to what actually scheme want to do,it may mislead which lead in destruction, it has a power to replace human jobs.[36]AI require great extent of time and money, rising generations could became lazy, joblessness and worklessness will be increased, Reliance on machines and new technology will be risen, Dependency on Technology will be increased, Mass scale destruction will be the result of misusing, Idea will only depend on the programmer. Program could be mislead and work in wrong way. [37]It lacks a basic sense on reasoning which might cause several problems, Impotency to describe an logic and cause behind sensible decision. It lead to lack in creatives and innovations. Blindly if we depend on Artificial Intelligence then it may cause :If someone mislead Artificial Intelligence it will produce irrelevant answers. No reason will be given for these irrelevancy.[38]Technology and Technologists are costly and highly priced, Technologies are undeveloped, They have been oversold in markets, It is difficult in connecting those with existing system. It is only too less people who expertise in technology. The supervisor does not understand how cognitive technology and how it work.[39] Equipment are all so expensive hence not at easy for developing machines, Even though machines are effective in working and cannot be substituted for activities of human in which can create a team .It is very expensive may cause bulk of cash in order to repair rebuilding and to create, Much drastic unemployment will happen in replacing jobs by Robots, Technology are just perform only for task they set for, other than it, it will crash, Many problems will raise with utilization standards when we do many works and tasks with use of robots in turn human activities and jobs will be less. But many company are just focusing for interchange just less qualified with more advance Robots in order that they do work more effectively.[40] Intelligence are considered as nature gifts,But it require lot of money for constructing huge machines. Artificial intelligence power may cause huge damages and machine get crushed and broken. For repairing and maintaining we require huge amount of cash. Updating hardware and software according to latest usage will waste in lot of time, money.

Conclusions of Artificial Intelligence?

The Conclusions of Artificial Intelligence it just help us to live a better life, Combining Artificial Intelligence with Machine Learning helps us to make many things much easier as there. Wondering, Since thousand years ago, Machine could understand , analyses and perform the activities what human could do. It makes the job easier , it helps in saving time, money to different sectors. On the wider way, it is branch under Computer Science, Where it's main aim is Machine Capacity or Ability is to generate Intelligent thinking and Reasonable answers for an External inputs. Even it help in Tough and Hard Works. It has Certain disadvantages there will no human touch (Knowledge) it make lazy and finally a mass destruction in human activities in Rising Younger Generations. Hence, Concluding that anything beyond a limit will bring a danger. We should keep track on it only for our usuage nothing other than it.

References

Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Alugubelli, R. (2016). Exploratory Study of Artificial Intelligence in Healthcare. *International Journal of Innovations in Engineering Research and Technology*, *3*(1), 1-10.

Ambare, V., Uphad, Y., Tikar, S., Rabade, N., & Ingle, N. Literature Review on Artificial Intelligence

Ambare, V., Uphad, Y., Tikar, S., Rabade, N., & Ingle, N. Literature Review on Artificial Intelligence.

Bartoletti, I. (2019, June). AI in healthcare: Ethical and privacy challenges. In *Conference on Artificial Intelligence in Medicine in Europe* (pp. 7-10). Springer, Cham.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages of Artificial Intellegence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages of Artificial Intellegence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Borah, J., Sarma, K. K., & Gohain, P. J. (2019). all pervasive surveillance techniques and AI-based applications: Current trends and challenges. In *Smart Devices, Applications, and Protocols for the IoT* (pp. 54-82). IGI Global.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Chen, X., Xie, H., Zou, D., & Hwang, G. J. (2020). Application and theory gaps during the rise of Artificial Intelligence in Education. *Computers and Education: Artificial Intelligence*, *1*, 100002.

Ciolacu, M., Tehrani, A. F., Binder, L., & Svasta, P. M. (2018, October). Education 4.0-Artificial Intelligence assisted higher education: early recognition system with machine learning to support students' success. In *2018 IEEE 24th International Symposium for Design and Technology in Electronic Packaging(SIITME)* (pp. 23-30). IEEE.Chowdhury, M., & Sadek, A. W. (2012).

Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard business review*, *96*(1), 108-116.

Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard business review*, *96*(1), 108-116.

Davenport, T., & Kalakota, R. (2019). The potential for artificial intelligence in healthcare. *Future healthcare journal*, *6*(2), 94

Ghimire, A., Thapa, S., Jha, A. K., Adhikari, S., & Kumar, A. (2020, October). Accelerating business growth with big data and artificial intelligence. In *2020 Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC)* (pp. 441-448). IEEE.

Hrnjica, B., & Softic, S. (2020, August). Explainable AI in Manufacturing: A Predictive Maintenance Case Study. In *IFIP International Conference on Advances in Production Management Systems* (pp. 66-73). Springer, Cham.

Khan, M. M., Rizwan-ul-Hasan, S., Ahmed, A., Khan, M. A., & Fahad, M. (2020, February). AI Surveillance UGV. In *2020 International Conference on Information Science and Communication Technology (ICISCT)* (pp. 1-6). IEEE.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Lawler, R. W., & Yazdani, M. (Eds.). (1987). *Artificial Intelligence and Education: Learning environments and tutoring systems*. Intellect Books.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

McCarthy, J. (2007). What is artificial intelligence?.

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In *Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi*.

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In *Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi*.

Nagao, K. (2019). Artificial intelligence in education. In *Artificial intelligence accelerates human learning* (pp. 1-17). Springer, Singapore.

Oke, S. A. (2008). A literature review on artificial intelligence. *International journal of information and management sciences*, *19*(4), 535-570.

Patel, P., Ali, M. I., & Sheth, A. (2018). From raw data to smart manufacturing: AI and semantic web of things for industry 4.0. *IEEE Intelligent Systems*, *33*(4), 79-86.

Preethi, S. (2020). A Survey on Artificial Intelligence. *International Journal of Intelligent Computing and Technology (IJICT)*, *3*(2), 39-42.

Preethi, S. (2020). A Survey on Artificial Intelligence. *International Journal of Intelligent Computing and Technology (IJICT)*, *3*(2), 39-42.

Rahim, S. M., Mohamad, Z. Z., Bakar, J. A., Mohsin, F. H., & Isa, N. M. (2018). Artificial intelligence, smart contract and islamic finance. *Asian Social Science*, *14*(2), 145.

Sadek, A. W. (2007). Artificial intelligence applications in transportation. *Transportation Research Circular*, 1-7.

Soldi, G., Gaglione, D., Forti, N., Millefiori, L. M., Braca, P., Carniel, S., ... & Farina, A. (2021). Space-based global maritime surveillance. Part II: Artificial intelligence and data fusion techniques. *IEEE Aerospace and Electronic Systems Magazine*, *36*(9), 30-42.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Timms, M. J. (2016). Letting artificial intelligence in education out of the box: educational cobots and smart classrooms. *International Journal of Artificial Intelligence in Education*, *26*(2), 701-712.

Woolf, B. P., Lane, H. C., Chaudhri, V. K., & Kolodner, J. L. (2013). AI grand challenges for education. *AI magazine*, *34*(4), 66-84

Xu, S., & Hung, K. (2020, April). Development of an ai-based system for automatic detection and recognition of weapons in surveillance videos. In *2020 IEEE 10th Symposium on Computer Applications & Industrial Electronics (ISCAIE)* (pp. 48-52). IEEE.

Yao, X., Zhou, J., Zhang, J., & Boër, C. R. (2017, September). From intelligent manufacturing to smart manufacturing for industry 4.0 driven by next generation artificial intelligence and further on. In *2017 5th international conference on enterprise systems (ES)* (pp. 311-318). IEEE.

GESTURE RECOGNITION FOR AUTOMATION

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Abstract

In this paper we have discussed about Gesture Technology and its implementation using Smart Phones and Smart Watches which are quite easily available, cheap and very easy to use. These devices have sensors built into them, such as accelerometer, which are not used to their full potential. We will use these sensors to recognize gestures and interpret them using microprocessors. These sensors will transfer the information collected by it through Wi-Fi to the microprocessor. This information will be sent to an online server where it will be processed using Artificial Intelligence (A.I). Here the raw digital signals will be converted into required instructions. These instructions will be sent back to the microprocessor and the microprocessor will thus execute the desired task. This project has numerous applications in daily life but most prominent application is for the differently abled people as these people will be benefited a lot with this technology. Other applications may include home automation and navigation.
Keywords: gesture recognition, deep learning, accelerometer, automation, microprocessor

Introduction

Gesture is the physical movement of a body part to express an idea or feeling. These can be recorded by sensors present in phones, smart watches and recognized by Artificial Intelligence (AI). This information can be used for automation purposes.

In today's world each of us has a smart phone and most of us possess a smart watch. These smart phones and watches possess sensors like accelerometer, gyroscope, motion detector etc. With the combined interaction of these sensors, along with Deep Learning AI Technology, we can determine the approximate posture of our body and we can use this data obtained for gesture identification. With the help of this we can automate most of the basic and intermediate tasks in our lives. This technology will be of great use to differently abled people who find it difficult to carry out simple tasks like switching on or switching off lights and fans. With the help of this technology these people will be able to carry out their day to day activities easily and help them to lead a more comfortable life. In India most of the people find this technology inconvenient as the current devices and equipments available for this purpose are either costly or highly sophisticated, making them difficult to use. Due to this inconvenience use of gesture technology is not very widespread. The devices that will be used in this project are very cheap and are used by majority of the people. Hence this project will make gesture technology cheaper and will help promote the widespread use of the same.

Literary survey

[1] Today everyone has smart phones which have good quality camera. Using these phones, microcontrollers and Bluetooth, an efficient gesture control can be implemented. To identify the gestures, the digital signals of the corresponding gestures are stored in the RAM of the mobile. Then

when we do some gestures in front of the mobile camera, the image of our gesture is captured and is processed by Principal Component Analysis (PCA). Thus, the image is converted into a digital signal. Now this digital signal is matched with the previously stored signals in the RAM. If it matches, the binary signal is received by the microcontroller via Bluetooth. Then the microcontroller creates a binary combination to pass it to the decoder. The decoder identifies the code and performs the necessary operation. For this project, the camera of your mobile should at high contrast and your mobile camera should have a flash in it to improve the accuracy of recognising the gestures. [2] Automating the home appliances is known as home automation. The home appliances may involve lights, fans, heaters, AC, etc. Our gestures can be mapped for controlling the home appliances. An interface can be used to connect them and they can be controlled creating a Personal Area Network (PAN). Then these devices can be connected to internet with the help of a router (IOT). An accelerometer can be used to capture the gestures. The voltage output generated by the accelerometer is received by the microcontroller. This microcontroller processes the voltage and sends it to encoder. The work of the encoder is to convert the data into the required form for transmission. Here the data is transferred to the receiver with the help of RF module. At the receiving side, there is a decoder which will decode the received signals. These processed signals will then be sent back to the microcontroller which will then actuate the relays and will switch the appliances. By this way the gesture controlling will be achieved. [3] User Centered Gesture is a gesture technology that involves the user in its devlopment. This makes the technology natural and easy to use. Due to increase in use of computing devices, a controller free interface is needed and use of gesture fulfils it.This technology will have lots of uses in the medical field.A surgeon can use this technology during an operation as the mouse is inaccessible at this time.Noldus Observer X9 can be used for analysis of these gestures.Two camera (stereo) setup is more accurate and is thus suitable for this project.Software for this technology uses small modules which are specialized for detection of a particular gesture.The software can also learn and improve upon the recognition of gestures.Study shows that use of gesture is more tiring than using mouse. [4] Gestures of our finger tips can also be used for the purpose of automation. Initially, we must extract the real time images of the fingertip. Extracting only the image of the fingertip and subtracting the background is often not very accurate when the background contains dynamic lighting. So, an infrared camera is used. This camera is adjusted to measure the temperatures which lie nearby the human body temperature range. Because of this the pixel value of the skin colour gets prioritised over the other colours, making the tracking of the fingertip more accurate. Once the fingertip is identified, then we obtain the trajectory of the fingertip by evaluating the successive image frames. We can do the same thing for multiple fingers as well. From the obtained trajectories, now we can interpret the gestures performed by fingertips. Now these gestures can be transferred to microcontrollers which will then process the gestures into binarized format and then will execute a desired task. [5] Use of hand gestures is a very powerful method in gesture technology. Many devices can be used for this purpose. One such device is the MYO armband. It is a device used for recognising gestures and we have to wear it on our forearm. This is used for using technology wirelessly with the help of our hand movements. It uses EMG sensors. These sensors are responsible to measure electrical activity from our muscles. Then this information is transferred to a compatible device using wireless Bluetooth technology. It uses a combination of gyroscope, accelerometer and magnetometer to identify gestures. There are a certain loopholes in MYO such as, when we place our one hand above the other, it is not able to identify the hand and the fingers accurately. Also, the device is quite costly. MYO armband has its applications

in gaming, presentations and visual entertainment. [6] This paper focuses on the Time Of flight technology (TOF). There are specialised TOF cameras available for this purpose. It uses optic reference signals which are useful to illuminate the things present in front of it. Now using smart pixels, the phase shift, with respect to the reference signal, is estimated. Along with the phase delay, amplitude of the reflected wave is also measured. Thus, with the help of this information we obtain a gray scaled image of the object. Thresholding of the distance and amplitude information is done to improve the accuracy. The reflectivity of this material is encoded in gray values. To decode these values, a decoder is required. [7] The technology suggested in this paper uses a pendant with a camera ringed with IR LEDs and IR pass filter over the lens, allowing gestures to be recorded even in the dark. It has a similar design to Toshiba "Motion Processor" project, which is used for interaction with desktops and portable computers. Since sensing and computing units are on the body, the same pendant can be used as a control unit in multiple locations with ease. Using a variety of complementing elements to increase the number of information sources the number and complexity of gestures can be reduced. It has much higher accuracy than voice recognition systems, and can be easily used in noisy environments as it is unaffected by the ambient noise. A camera with a 160° field of view was used to take the video of the gesture performed by the user. It is simple to use and can be used by elderly people or those with loss of vision, motor skills and mobility. The setup is currently power inefficient due to off-the-shelf components which consume a lot of power. It is also difficult to create a battery with enough capacity for a full day's use and small enough to be lightweight and non-obtrusive. [8] Uses wireless signals for the recognition of gestures, requiring no instrumentation or cameras. Since the signals can pass through walls and do not require line-of-sight communication, a limited number of signal sources can be used for automating a large area. The gestures are recognized using minute doppler shifts and multi-path distortions produced due to interaction of the signals and human motions. Since the doppler shifts produced due to interaction in normal Wi-Fi signals are negligible as compared to the frequency of the signals, the received signal is transformed into a narrowband pulse, making it easier to detect the small doppler shifts. WiSee uses MIMO capability to focus on gestures from a particular user. Using a trigger approach, similar to the ones used by multiplayer games using Xbox Kinect, the user controls the interface by performing a particular gesture pattern. Limitation of WiSee is that the accuracy reduces the number of users increase for a fixed number of transmitters and receiving antennas. [9] Uses a range camera to obtain depth data of an object. 3D range camera captures data unambiguously and at a high frame rate. This eases the task of segmentation and tracking in a 3D space. The 3D camera uses a Time-Of-Flight approach to obtain the distance of a point. This is achieved by using modulated infrared light. Both the depth and intensity data received from the sensor has a lot of noise, making pre-processing essential. This is done by removing those pixels whose amplitude after reflection is below a pre-determined threshold value. The depth is then recalculated at these points using a linear interpolation method. However, points near the edge of the hand end up getting merged into the background as the resolution of the sensor used is limited. Lighting conditions also affect the depth data, but this is rectified by frequent calculation of the average intensity value of the obtained images. The depth value of the object cannot be measured accurately at high speeds, so the data obtained from the centroid is used as a rough estimate of the depth. The hand can be segmented using a histogram method, which compares the collected data and compares to find the section with the least distance and having a sufficient number of points. [10] Uses a 5-sensor data glove to efficiently recognize hand gestures. This approach uses customized gloves which is a cheaper

alternative than vision-based methods which require sophisticated equipment and extensive pre-processing. The gestures used for testing were static only. PNN is the optimal solution for the core component. It has high recognition rates, can be used to accommodate various hand anatomies and can store around 16 hand gestures. However, it uses a lot of memory as the execution is slow. Thus, a combination of clustering algorithms are used along with a four-tier architecture. Every combination of open/closed finger is given an index starting from 0(fist) to 15(open hand). The gestures are recognized on the basis of a boundary value. If the reading obtained for the finger is above this value, it is considered to be closed, if it's above the boundary value, it is considered open. At the boundary value the reading is considered as undefined. This method sometimes misinterprets the gesture due to the anatomical differences between people and cross coupling of optical sensors. Since the simple gestures lacked symbolic meaning, complex static gestures were introduced. This data was recorded using a small Python routine. It saved a record containing six fields, the first five for the readings obtained from the sensor and the last one for the gesture.

Findings

After our study, we found out that not only the sensors in our phones and watches, but also many other devices can be used for this purpose. The devices like MOY armbands, TOF technology can be useful in this project. But these devices are quite expensive as well. The A.I Technology involved in this process can be difficult to develop, but use of online services like Google Development Platform, which allows us to integrate Google's APIs can make this task easier. Currently a lot of research work is going on in this area and there is a lot of scope for future research. But the only thing that makes our project different from others is that, it will be cheaper than most of the current projects. Also, the use of simple devices such as mobile phones and smartwatches is currently unexplored. Due to the introduction of easily accessible cloud services and internet access, it is now possible to connect this project to the internet easily.

Conclusion

Initially, our idea was to control and recognise gestures using only the sensors present in our mobiles and smart watches and the use this gesture technology in the field of automation. After studying about this topic in detail, we realised that the mobile cameras can also be used for capturing the gestures and this would be of great help. A merit of this project is that it would very cheap as it uses smart phones and smart watches which are available at very cheap rates these days. A microprocessor chip required is also a very cheap device. Also, gesture technology is gaining a lot of importance these days and it has its applications in almost all sectors. The demerits of the project include, the range for operation may be limited. The biggest difficulty will be to make it accessible to all. As the field of gesture technology is new, there are a lot of things to investigate. Also, there is a lot of scope for further research in this area. The field of gesture technology would definitely contribute in building energy efficient automated devices.

References
Dey, S., Das, A., Mishra, A., & Dutta, D. (2015). Gesture controlled home automation. International Journal, 162.

Li, Z., & Jarvis, R. (2009, December). Real time hand gesture recognition using a range camera. In *Australasian Conference on Robotics and Automation* (pp. 21-27).

Luzanin, O., & Plancak, M. (2014). Hand gesture recognition using low-budget data glove and cluster-trained probabilistic neural network. *Assembly Automation*, *34*(1), 94-105.

Mulling, T., &Sathiyanarayanan, M. (2015, July). Characteristics of hand gesture navigation: a case study using a wearable device (MYO). In *Proceedings of the 2015 British HCI Conference* (pp. 283-284). ACM.

Oka, K., Sato, Y., & Koike, H. (2002). Real-time fingertip tracking and gesture recognition. *IEEE Computer graphics and Applications*, *22*(6), 64-71.

Penne, J., Soutschek, S., Fedorowicz, L., &Hornegger, J. (2008, September). Robust Real-Time 3D Time-of-Flight Based Gesture Navigation. In *Mensch & Computer Workshopband* (pp. 79-81).

Pu, Q., Gupta, S., Gollakota, S., & Patel, S. (2013, September). Whole-home gesture recognition using wireless signals. In *Proceedings of the 19th annual international conference on Mobile computing & networking* (pp. 27-38). ACM.

Starner, T., Auxier, J., Ashbrook, D., & Gandy, M. (2000, October). The gesture pendant: A self-illuminating, wearable, infrared computer vision system for home automation control and medical monitoring. In *Wearable computers, the fourth international symposium on* (pp. 87-94). IEEE.

Tambe, P., Nigam, A., Raj, M., & Chaturvedi, R. GESTURE CONTROLLED HOME AUTOMATION.

Van Beurdena, M. H., IJsselsteijna, W. A., & Hopfb, K. (2011, May). User centered design of gesture-based interaction technology. In *3DTV Conference: The True Vision-Capture, Transmission and Display of 3D Video (3DTV-CON), 2011* (pp. 1-4). IEEE.

ARTIFICIAL INTELLIGENCE: THE 8th NEW WONDER OF THE WORLD

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Introduction

Artificial Intelligence is the latest and the fastest growing sector of the technological world. Though AI was always talked about great thinkers and philosophers, it was never applied in real life. Even a century back, AI was simply a pipe dream, but now there has been such a massive advancement in this area that it is unprecedented in the history of the technological world. Once considered as an impossible task, is now becoming a part-and-parcel of life. It would not be a mistake to call Artificial Intelligence the 8th New Wonder of the World. What's more interesting is that the wonders of AI are yet to be completely unveiled. In order to understand this complex world of AI, we should start from the basics, that is, by comprehending what 'Artificial Intelligence' actually means.

What is AI?

[1] Artificial intelligence is the science of making computers comprehend and replicate human intelligence in a detailed manner. Complex computer programs are created to perform human tasks, giving importance to the smallest of details that may escape the human eye. AI focusses on studying different challenging problems around the globe. [2] It learns from data gathered from external sources, and utilises them to complete tasks assigned to it in the future. In simple words, AI works similar to its biological opponent, human intelligence. According to the Dartmouth Research Project of 1955, a system is said to possess AI, when it performs tasks in a manner that if it were human, would have been called intelligent. Simply put, as the name suggests, AI is a machine that works intelligently. Though what can be defined as 'intelligent,' is yet to be decided.

History and Growth of AI

[3] The idea of Artificial Intelligence started, among philosophers, with the thought of understanding the essence of human existence, using an intelligent device. When the first calculators were invented by Blaise Pascal and Gottfried Wilhelm Leibniz, it was also a step towards AI; until then, calculations were something that only a human mind could perform. Similarly, with the successes in mechanical engineering grew the possibility of incorporating intelligence into devices. This endeavour of centuries bour its fruits through robotics in the recent decades.But it is to be noted that AI is not only about robots. Computers and robots are just experimental equipment to experiment the potential of AI.Though ideas about AI have been on the table for over a century, they were merely assumptions and theories. These theories could only be experimented after the development of computers and programming language. Such experiments have accelerated in the last 50 years.[4] A different approach to these experiments was brought by the English Mathematician Alan Turing. Instead of building machines, he turned to computer programs to explore artificial intelligence. He was followed on these lines by many researchers towards the late 1950s. [5] The first leap towards AI was taken in 1956 at the 'Artificial Intelligence' Conference at Dartmouth College. In 1965, ELIZA, an artificial intelligence program was invented. This was soon

overtaken by the first animated robot 'Shakey' in 1966. By 2010, ASIMO took over the world with its remarkable performance in imitating the human intelligence. [6] In 2011, IBM Watson, a revolutionary AI System, defeated world famous players, Ken Jennings and Brad Rutter. Deep Learning became a critical part of AI with the experiments conducted by Yoshua Bengio, Geoffrey Hinton, and Yann LeCun. They were honoured with the Turing Award for their exemplary work. Another astounding achievement in the field of artificial intelligence is the development of the GPA^2 in 2019. It successfully carried out complex language-related problems with no prior training. After the revolution in mobile phones and cloud, AI is now considered as the fourth industrial revolution.

AI in Healthcare Appliances

[7] Diagnostic systems, based on AI, are being developed by many researchers recently. For example, the Caduceus program (Miller82) suggests the medical tests that have to be performed, by interpreting the symptoms inputted and later, performs disease diagnosis with the test results. [8] One of the most popular application of AI in the medical field can be seen in the manufacture of Artificial Neural Network (ANN). With networks resembling the biological neuron, ANNs have 'neurons' that use raw data from various inputs to give precise, specific outputs. All credit goes to McCulloch and Pitts who used binary threshold functions to achieve this in 1943. Another fascinating application of AI is evident in Evolutionary Computation. By applying the rules and patterns in natural selection and survival of the fittest, evolution is utilised in giving solutions to real-life challenges. For clinical diagnosis and image analysing in radiology and histopathology, ANNs are being increasingly used. An algorithm called ProstAsure Index was programmed to distinguish between harmless and malignant prostates. It had an accuracy of 90%. Another such algorithm is PAPNET which helped cytologists in diagnosis. This was even introduced in a commercial scale. Accurate diagnosis and predictions can be made with the help of ANN systems. Even survival rates of patients can be calculated with this technology. Another method employed isEvolutionary Computation. This utilises evolutionary data like natural selection and survival of the fittest to solve real world problems. One of the many algorithms that follow this method is the 'Genetic Algorithm' by John Holland. It collected large amounts of data regarding natural selection and evolution. Then, solutions were designed based on these data. Through the method of elimination and selection, the best solution for the problems were designed. This data is utilised for diagnosing melanoma, lung cancer and brain tumours. Mammographic microcalcification is also analysed using genetic algorithm. Fuzzy Expert Systems are used for diagnosis of acute leukaemia, lung cancer, breast cancer and pancreatic cancer. Vasodilators for controlling blood pressure are installed using Fuzzy controllers. It is also used for administering anaesthesia in operating rooms. [9] Due to its higher precision and accuracy rates, AI is used by dermatologists to discover malignant skin growths. The only input required for this complex diagnosis is a digital photograph of the disordered skin. This application of AI is extended to other branches of medical science like radiology. In areas where experts of a disease are not present, AI diagnosis systems can be used. For example, in many TB-ridden places, AI interprets radiographs and diagnosis is made. This is particularly useful in remote areas. In medicine, there is an added advantage of using AI. There is no risk of doctors losing their jobs because of more efficient AI systems. This is because an AI system cannot connect with the patients on an emotional level. Moreover, in many situations, ethical moves have to be taken, instead of following an algorithm.

AI in Manufacturing and Production

[10] Deep-learning has been introduced into manufacturing systems for inspecting production, detecting errors and maintaining the system. AI and tradition manufacturing methods are being combined to produce better results. AI is extensively used in manufacture of semiconductor. Feasibility of models before complete production can be assessed through complex AI systems. This saves the manufacturers extra cost, during the experimenting phase. Similarly, smart factories are being set-up in a large-scale to create a more efficient workplace. With the collaboration of Data-driven manufacturing and Additive manufacturing, Smart Factories are no longer a fantasy. Machine learning, feature selection and sensor data are being employed to increase the level of detection. [11] In traditional factories, though computers were present for large scale storage of data, to make any decision-small or big- human interruption is necessary. With the introduction of Artificial Intelligence in factories, the system itself can take many decisions without the supervision of a manger. This facilitates higher productivity. Humans can be reserved for other major tasks. If needed, mangers can monitor the performance of the system in the end of the day or week. Automated systems in factories are basically AI systems given high managerial positions. The system carries out supervision and work-station control. It facilitates processing of large amounts of data in a short time. Some AI systems are specifically designed for making decisions for problem solving. These systems can handle larger amounts of data than usual. [12] Advanced robotics is applied in assembling parts of various products. AI robots carry out repetitive tasks accurately, without getting tired. This increases efficiency, saving time and money. AI can be used to inspect the quality of products manufactured.One of the industries that make use of this is the aircraft manufacturing industry. The system can check parts of the aircraft for even the smallest of mistakes or errors. Another commercial use of AI can be in supermarkets and other stores where AI systems can keep track of the quantity, quality, sales and demands of products. They can be designed to make automatic orders depending on sales and demand of products. Expired products can be disposed without human intervention. AI can be installed to keep a check on other systems in the factory. For example, in Mueller Industry, a major error in one of there machines with the help of their AI system. This saved them from a huge catastrophe. In factories, simulations, using AI, can be conducted on the model of products before actually building the product. With this, each model can be tested and evolved before creating the final perfect product. This not only saves time, but also money. Augmented Reality devices can be given to factory workers to provide them with useful information, while performing a task. This can improve the efficiency of the workers and also improve the quality of work done.

AI in Security and Surveillance

[13] The role of AI in surveillance is increasing exponentially on a global scale. More than 176 countries are utilising Artificial Intelligent systems for monitoring purposes. Nearly 64 countries have employed facial recognition and 56 countries are experimenting smart cities. Smart policing is also popular now, with nearly 52 countries installing this system. Governments of many countries are adopting AI systems for remote surveillance, unmonitored by humans. Facial recognition cameras and complex analytical software are utilised for this purpose. [14] Providing access to only authorized personnel and intrusion detection are the main jobs of AI in security systems. Some advanced systems can even detect suspicious behaviour, following a set algorithm.Movements can be detected by AI-installed surveillance cameras. Advanced AI cameras record only when there is

motion, instead of unlimited recording. This saves large amounts of storage space. High level systems can particularly distinguish human motion and other motions. Thus, they can be programmed to record when there is a human nearby, instead of creating large files of useless data. While face recognition identifies faces, human detection distinguishes particular human actions from other movements in the surrounding. [15] Object-detection can be installed in CCTV surveillance to detect the presence of weapons. AI system processes the images and set-off an alarm, if dangerous items are recognized. In countries where firearms are legal, the surveillance system can alert the CCTV operators to further assess the situation. Convolution Neural Networks (CNN) are powerful tools for weapon detection. Michał Grega and Andrzej Matiola have worked towards designing systems for recognising dangerous tools. The algorithm that they created has a sensitivity of 81.8% and specificity of 94.93%.

AI in Education

[16] Artificial Intelligence was incorporated with education more than two decades back. Some of the first such AI Systems are Computer-based training (CBT) and Computer Aided Instruction (CAI). Though they do not provide the ideal student-teacher bond, they were quite useful to learners. Recent researches are directed towards Intelligent Tutoring Systems (ITSs) to enhance the interaction between the system and the learner. ITSs are more flexible in these lines. It forms a connection between the course content and the learner's knowledge. Based on study, it has been proven that students using ITSs have shown improved performance and are more motivated academically than students under traditional educators. ITSs have various methods for teaching. Some advance ITSs teach with the help of simulations of real-life situations. This helps students to comprehend information in great depth. Advanced Cardiac Life Support (ACLS) is one such ITS that creates realistic simulations of medical emergencies and monitor the actions of the student in such situations. This equips the learner to take quick action in real life. Students can also experiment their hypotheses and assumptions with the help of these stimulations. ITSs typically have five parts: the expert model, the domain knowledge, the student model, the communications module and the pedagogical module. Among this, pedagogical module is still undergoing large-scale research. [17] ITSs have currently taken over the education field under AI. Unlike the older Computer Based Learning systems, ITSs have incredibly flexible teaching methods and strong reasoning capacity. These systems have expertise in machine learning, natural language, planning, reasoning, explanation and knowledge representation. ITSs have also facilitated a platform for testing cognitive theories. Researches concerning collaborative learning is taking place in different ways. For example, Computer-based collaborative tasks (CBCT) are designed to enable students to work together by connecting their respective tutors. Thus, many students can interact and collaborate, while sharing their files and data in a common area that everyone can access. Sherlock and The Envisioning Machine are two most known examples of CBCT. Intelligent Co-operative Systems behaves as learning partners to students. Co-operative Tools (CT) perform lower-order jobs, during the learning process, and thereby, taking some burden off the student's shoulder. Computer Mediated Communication (CMC) acts as a platform for interaction among several students. Groupware systems and Email Conferencing come under CMC. Hypermedia systems are another means for collaborative learning. One such example is the CSILE environment. This has a database, created by students. Students can use this system to make notes, refer others' notes and help each other in the learning process. It facilitates quick searches and rapid access of accurate data. [18]

Artificial Intelligence has brought about the 'Black Box of Learning.' It gives the learner a deeper, precise knowledge of the subject. On the basis of this, new software is being developed to aid education. Certain features like tracking the learner's path to gaining knowledge to understand the entire process of learning. Thus, AI in education helps to connect human intelligence to the AI world. This collaboration of AI and education can be made more sophisticated. Each learner's progress, achievements, approach to learning, methods of learning can be intricately studied and appropriate steps can be taken easily to improve the learning process. A personalised teacher for each student was always the best way for learning. Now, AI has made such teachers a reality.Repetitive, time-consuming tasks that were traditionally assigned to teachers can be given to AI systems, allowing teachers to engage in other more important tasks. Research skills of students can be enhanced with the help of AI assistants. Other skills that are necessary for surviving in the coming technological world can be inculcated in students. With the advanced facilities that only AI can provide, students can invest more time in experimenting different areas of knowledge and finding their true passion in life.

Advantages of AI

[19] In traffic management system, AI sensor network can quadruple its efficiency and usefulness. Traffic sensors can be further modified to intelligent agents that monitor traffic. Using microscopic traffic data collected from vehicles, traffic predictions can be made via AI Systems. Recent researches have shown that robotics can be applied in controlled environments without much need of system intelligence, thus, increasing its feasibility and cost effectiveness. AI systems can make the process of decision-making much easier and faster. Extremely complex problems can be solved very fast with the help of the complex algorithm of AI. Expenses of companies can be reduced by reducing the number of staff for a particular task that can be replaced by a system. Employees can be given bigger more meaningful tasks. Both qualitative and quantitative data can be handled efficiently by AI, unlike other analytical systems. [20] AI systems have been designed to maintain computer security, using knowledge along the same lines as biological immune systems. They detect intrusion in the computer and take necessary dynamic actions simultaneously. From Classis AI, we have moved on to Distributed AI that can collect and share data with other systems by interacting with them. This works similar to human social interactions. Artificial Intelligence has advanced enough to make flexible choices, according to the data collected from its environment. Thus, they can be employed in cybersecurity systems. Neural networks, evolutionary computation, fuzzy logic, and so on, have empowered AI Systems greatly. Genetic algorithms are now the robust and accurate technique for solving complex scenarios and problems. Mimicking natural selection process, this machine learning approach has now gained much importance in the real world. [21] AI has the greatest advantage over human intelligence, when it comes to taking decisions based on facts and not emotion. This means that more logically accurate decisions can be taken faster with maximum accuracy rates. AI machines are robust and never get tired. In addition to that, adding new information or knowledge is much easier in AI Systems than in humans. Spreading knowledge, among systems, can also be carried out by a simple method of copy and paste, saving time on human training. [22] It can be said that AI has more successes in carrying out intellectual task in a short time than other systems. Computer Aided Instruction (CAI) studies human behaviour and executes tasks, utilising that knowledge in a better and faster manner. [23] Construction Ontology-based NPD Process Recommendation Smart System (ONPS) help in detecting cancer in an earlier stage than any other systems yet manufactured. It has the best knowledge and reasoning ability in this field. Additionally, it is easy to maintain. [24] Since the expenses of the AI system is mainly restricted to

initial installation and maintenance, in the long run, it is more profitable and cost-effective than paying employees on a monthly basis. Installation of AI is relatively simple. Areas where its actually dangerous for humans to work, like in mines and petroleum extractors, AI machines can be used. Moreover, work accidents can be prevented using AI. Humans are prone to make mistakes, irrespective of the number of years of experience is there. But AI is free of errors, as long as it is programmed correctly in the beginning of the task. Companies now-a-days make use of digital assistants as part of their customer-service team. Interactions these days with chatbots are so similar to human interactions that it is almost impossible to distinguish between a chatbot and an employee. IT companies have developed assistant applications for their clients which are now being utilised on a global scale. Undoubtedly, Artificial Intelligence makes our lives easier and it will continue to do so in the coming years.

Challenges or Dis-advantages of AI

It goes without saying that AI has its evils too.[24] AI Machines are not only expensive to build, their maintenance and repair uses much more money than what it actually brings into the company. There is a huge risk of creating a lazy generation because of the extensive use of AI. Machines are incapable of creating bonds like humans that boost team performance. They are also not as flexible as humans, with respect to work-related problems. Any unexpected scenario outside their programming cannot be dealt by these AI systems. Many industries are trying to replace the less-qualified workers with AI robots. This can affect utilization standards.[25] Improper use and mishandling of AI can lead to huge disasters. So, in the wrong hands, AI is a dangerous weapon. Even a minute error in the program can bring about completely opposite results. Moreover, AI Systems have taken over a large number of jobs that were, until recently, done by humans, leading to unemployment. Many AI projects and systems are not cost and time effective yet. It takes more time and money than any other systems or methods. [26] It goes without saying that AI has 0% creativity. Most systems are incapable of explain their decision to a particular problem. In the present systems, if the problem is beyond its scope, it will never know the solution. Since all the solutions of AI systems are blindly believed, even if there is an error or malfunction, it will not be discovered until its very late. Situations were common sense and emotion has to be applied will leave AI systems handicapped. [27] In many scenarios, the analyst or programmer will have to carry out a tedious process of trial-and-error before the data can be fed into the system. For example, in neural networks, it is only after the analyst makes important decisions regarding the nature of the search, that the system can interpret the situation. This applies for other branches of AI like genetic algorithm. [28] Another obvious shortcoming of AI is that it functions with 'deep-learning,' unlike humans who use 'one-shot learning.' One-shot learning is much more flexible and human intelligence is capable of that because of the meticulous process of natural selection. It has taken generations for humans to develop it through evolution. Such a huge feat has not been achieved by Artificial Intelligence till date. Unlike a human brain, AI cannot adapt to a change in environment without a major change in its algorithm. [29] AI also can further decrease the credibility of the information found on the internet. This is because AI can pretend to be a human and spread fake information online. Spamming and phishing attacks can also be carried out by AI which will go undetected. Social networking platforms can become preys to automated spread of inaccurate data. This will make it impossible for the public to believe any content found on the internet. Many activists around the globe are also raising the ethical issues concerned with widespread use of AI. How far the we can trust Artificially Intelligent machines is still a debatable topic.

Conclusion

Artificial Intelligence has achieved great feats in the past few decades. It is, truly, the next Industrial Revolution. There is no sector of the industrial world that AI does not touch. This also poses a threat to humanity.It is predicted that soon unemployment would rise exponentially. Many jobs will be wiped out completely. Despite being a recent invention, AI has already overtakenhuman intelligence. Once it grasps its power over common sense, logic, and ethics, AI would rule the world. Professionals claim that new jobs will be created in this process. From one side, that is also true. No system can replace a man. Human intelligence may not be as fast as AI in calculations, but we have the best survival instincts in this world. I believe that nothing can ever defeat human instincts and intuition. According to me, AI will be a useful tool for us to enhance our performance. Though it is a creation of humans, who have finite lifespans, AI has infinite capabilities that we can keep on unfolding for generations to come. AI will undoubtedly live for an eternity.

References

Alajrami, E., Tabash, H., Singer, Y., & El Astal, M. T. (2019, October). On using AI-based human identification in improving surveillance system efficiency. In 2019 International Conference on Promising Electronic Technologies (ICPET) (pp. 91-95). IEEE.

Andriessen, J., & Sandberg, J. (1999). Where is education heading and how about AI. International Journal of Artificial Intelligence in Education, 10(2), 130-150.

Beck, J., Stern, M., & Haugsjaa, E. (1996). Applications of AI in Education. XRDS: Crossroads, The ACM Magazine for Students, 3(1), 11-15.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages and Disadvantages of Artificial Intelligence. Aayushi International Interdisciplinary Research Journal, 227-230.

Blagoj DELIPETREV, Chrisa TSINARAKIi, Uroš KOSTIĆ. "Historical Evolution of Artificial Intelligence", EUR 30221 EN, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-18940-4, doi:10.2760/801580, JRC120469

Blagoj DELIPETREV, Chrisa TSINARAKIi, Uroš KOSTIĆ. "Historical Evolution of Artificial Intelligence", EUR 30221 EN, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-18940-4, doi:10.2760/801580, JRC120469

Buch, V. H., Ahmed, I., & Maruthappu, M. (2018). Artificial intelligence in medicine: current trends and future possibilities. British Journal of General Practice, 68(668), 143-144.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. Ai Magazine, 26(4), 53-53.

Bullers, W. I., Nof, S. Y., & Whinston, A. B. (1980). Artificial intelligence in manufacturing planning and control. AIIE transactions, 12(4), 351-363.

Charniak, E. (1985). Introduction to artificial intelligence. Pearson Education India.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Crandall, D. J. (2019). Artificial intelligence and manufacturing. Smart Factories: Issues of Information Governance, 10-16.

Dilek, S., Çakır, H., & Aydın, M. (2015). Applications of artificial intelligence techniques to combating cybercrimes: A review. arXiv preprint arXiv:1502.03552.

Feldstein, S. (2019). The global expansion of AI surveillance (Vol. 17). Washington, DC: Carnegie Endowment for International Peace.

Hsu, Y., & Chaing, Y. H. (2021, July). The Strategic Advantages of Artificial Intelligence System for Product Design Teams with Diverse Cross-Domain Knowledge. In International Conference on Human-Computer Interaction (pp. 408-419). Springer, Cham.

Kakadiya, R., Lemos, R., Mangalan, S., Pillai, M., & Nikam, S. (2019, June). Ai based automatic robbery/theft detection using smart surveillance in banks. In 2019 3rd International conference on Electronics, Communication and Aerospace Technology (ICECA) (pp. 201-204). IEEE.

Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. Business Horizons, 62(1), 15-25.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. International Journal of Library & Information Science (IJLIS), 9(1), 3.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education.

McCarthy, J. (2007). What is artificial intelligence?

McCarthy, J. (2007). What is artificial intelligence?

Mijwel, M. M. (2015). History of Artificial Intelligence Yapay Zekânın T arihi. Comput. Sci, 3-4.

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi.

Ramesh, A. N., Kambhampati, C., Monson, J. R., & Drew, P. J. (2004). Artificial intelligence in medicine. Annals of the Royal College of Surgeons of England, 86(5), 334.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Teng, X. (2019, April). Discussion about artificial intelligence's advantages and disadvantages compete with natural intelligence. In Journal of Physics: Conference Series (Vol. 1187, No. 3, p. 032083). IOP Publishing.

DETECTING TUMORS IN HUMAN BODY BY
THE MEANS OF LIGHT

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Abstract

Magnetic Resonance Imaging(MRI) has become one of the greatest inventions used to find even the smallest cancer particle in a living creature. But is it really safe? Aren't there any risk factors involved in the usage of x-rays or gamma rays? Here we have gathered information about the usage of just light from our visible spectrum to not only detect the cancer particles, but also the behaviour and activities of these particles. Light is all around us, and we don't use it to its maximum potential. Why go for artificially produced light for treatments and other purposes when you can use the natural source of light. It has been recently found that light which falls in the visible region of the electromagnetic spectrum can be used to see deep inside body and brain and conclude with suitable treatments. A recent advancement in the study of biomedical and technological advancement shows that there are various means by which tumors and other harmful molecules can be detected and diaphanography is becoming a major part to study upon under this particular area.
Keywords: infrared light, diaphanography, tumors, holography, oncology

Introduction

Healthcare, the most sought-after sector of the modern world, is witnessing new heights when it comes to technological advancements. The use of magnets and electricity was the beginning of this developing era when it started to shift away from the simple technique of guessing via symptom analysis. Each and every time, our brain makes us believe that this is the best development that is possible in this sector, however the very same brain, forces us into asking the questions of how and why. Thus, when healthcare was peaking with the use of electromagnetic instruments, Science, on its own led us into another astonishing discovery which was intelligently put together for yet another invention in this concerning sector. We come to realise that light pierces through our flesh and comes out of the surrogate direction, following the very same path as through which it enters. This light then passes through human cells help in discovering tumors and blood clots all through our body. Now, the only shortcoming of this technique is that light, when passing through this medium, scatters, as is it's property. Thus, we use a hologram to 'de-scatter' the scattering rays of light. This solves most of the problem that is faced while using this technique. There is a high-tech miniature imaging device, which can image the most sensitive organ of the human body, that is the brain, without causing any damage, since it uses infrared light or simply red light or green light. This is so small, it consists of only 3 discs which use sound waves and light waves simultaneously to detect tumors inside our brain and other body parts. This technique is more efficient, cost wise and space wise, and thus can be made easily available to remote areas, in ambulances and emergency rooms of the smallest of hospitals as well, so as to save the time after a stroke to detect it's type and provide the right treatment to the victim. This miniature computerized imaging device is so compatible that it doesn't require any kind of surgery or alternative brain surgeries either, it can simply be worn around one's waist as a bandage or on one's head, as infrared light has no problems in crossing the skull. Moreover, usage of red or infrared light doesn't cause harm like that of gamma rays or x-rays,

as when they penetrate through our body, sometimes cause tumours. So, this is by far the most intriguing of all the recent inventions and can be the most effective of all as well if studied and promoted properly. Especially, in a country like India, where medical facilities are not present in most of the remote areas and are unavailable to almost 65 percent of the population, this device can act as a messiah and save a lot of lives.

Literary Survey

[1] Diaphanography a technique which uses near-infrared light to image inside the tissues and that helps us see the internal structure and thereby helping characterise tumours easily. Photon migration is nowadays used in analysing the scattering images on an ultrafast timescale. Light propagation in human tissues gets difficult after every small movement deeper inside. For this reason, light undergoes multiple scattering from a collimated beam and propagates through various layers of tissues. Another method is known as the temporal resolution method which has helped in imaging structures of various tissues, predicting drug levels used for various treatments. This method has also been used to identify solid tumours which are embedded deep inside beneath the tissues by using short light pulse and reading the phase and frequency of the output pulse obtained. These methods, which help in measuring malignancy, and other factors like age and menopausal status can determine primarily the presence of breast cancer.

[2] Light of the visible region is used in imaging of tissues and tumors. But it mentions that the use of NIR is better compared to red light as haemoglobin and blood have smallest adsorption coefficient of this region of light which prevents any further complications as in gamma rays or x-rays. Nowadays, it is used in collaboration with MRI to get the desired result. The focus is also given to the detection of early cancer and symptoms using receptor -targeted probes, to get the effect reduced. Fluorescent proteins are also used which are similar to CT but uses a framework to analyse the diffused nature of light photons in tissues. Bioluminescence imaging technology uses light emitted during enzyme catalysed reactions to detect flaws in molecular level and in small animals. This analyses each part of the animal and gives partial holographic imaging of the defects present in the body and guides us to proceed to further actions to be taken. It also says that proceedings in this field are going to bring about drastic changes and also help reduce the minimum of the absorption and scattering of light that will happen with advancement in this technological world.

[3] The world of biochemical imaging got a new development with the Introduction of invasive mapping that use fluorescence to map molecular events in intact tissues. The silver lining of this new technology is that the base of this technology is strengthened by the detection and discovery of probes which are not only specifically fluorescent but are also amazingly biocompatible and, also new technologies for highly sensitive imaging was developed. The ability of photons to be able to penetrate several centimetres in tissue can be attributed to fluorochromes which cause water and haemoglobin to be absorbed minimally and emit in the near Infrared range.

[4] Visible light inside opaque objects is generally absorbed or scatter the light photons entering it. This difference has led to light probes categorised as spectroscopy and imaging. The utility of either of this approach is based on how well the methods can differentiate the defective tissue and the normal tissue. Spectroscopy is useful in the time to time analysis in the alteration in the absorption and scattering rates. This helps us get them to the right conclusion of what the exact problem is like in monitoring the flow of blood in the various cerebrum lobes-frontal, parietal or occipital and giving results of internal bleeding due to any head injury. The imaging is used to

differentiate it from the background tissue and detect early the cancer globule and curb the problem before it can spread any further. An experiment is performed where a setup is made similar to human tissue and two optical fibres are used to inject infrared photons onto the sample and the other is used to detect the photons at some other location. These read out the various patterns of scattering and absorption and help in locating the exact position of the particle.

[5] The focus is given on the need to detect a tumor in the early stages of its formation. This diagnosis of premature lesions is crucial for decreasing its complexity and increasing the survival rate. Chromoendoscopy and fluorescence endoscopy have been developed to increase the detection of tumors in various parts of the human body, like the lungs and colon. Cyanine dyes have been used to bind to receptors on the tumor affected cells. These are used due to high selectivity and affinity with low doses of input itself. It also talks about the low penetration of near-infraredlight but the dyes help in the detection ofof-of superficial lesions.

[6] Multispectral polarised light imaging(MSPLI) is used for the inspection of skin cancer and also study different skin disorders. Confocal microscopy is the method used for focussing light on the specimen. An image is captured by gathering the behaviour of the light reflected which is collected by the detector of the microscope. The difference in the resolution in the detector tells us the difference in the thickness of the cancer tissues. This method allows imaging in large view, is cost efficient and less time consuming, but doesn't supply information about the primary structure of the cancer cell.

[7] There are many methods of imaging tumors in small animals like planar imaging, fluorescence tomography, bioluminescence tomography and optical detecting. These methods allow three-dimensional imaging which helps us analyse better. Planar imaging is all the more complicated as it doesn't allow resolving of tissues whereas tomography changed this idea and gave way to overcome the same.

[8] Hematoporphyrin derivative(HPD) is found to be used in curing cancer in areas like breast, colon, etc. It is found to be curative for a number oftumors. The experiment is carried out by using the dye followed by the focusing of red light on the spot of the tumor. Results have shown that complete response towards tumors was found within a span of 24 hours.

[9] In vivo imaging -in association with the near-infrared light has been used under the detection technologies in the new ways of biological approach.There is a comparison being made with different methods which are primarily based on resolution, depth of penetration, the detection of threshold probes and expandability of the image. In vivo is being used in collaboration with other methods to increase the accuracy in the end results.

[10] Approaches of molecular imaging to detect and phenotype tumors has made it which allows it to study deep inside the tissues and also observe the structural differences in the affected tissues. Fluorescence imaging allows us to observe the fluorescence change in the animals but limits to the fact that it only allows resolving of fluorescent molecules. This uses a methodology that it injects red light to the specimen and the reflected light is got by the detector in the form of green light with precision and accuracy in the structure as well as the location of the tumor.

Findings

The research gives us a clear idea on how there are many ways in which tumors and other hazardous particles can be detected using the means of light which falls in or near the visible region of the electromagnetic spectrum. This helps us

Conclusion

Detection of tumors using light was thought to be a really small topic which was not so when we completed the paper. The technological advancement in this field is unexceptionally vast and the study is still proceeding further, where faster and better results will be processed in near future and hope to see the technology reach every part of the world and make the smallest difference in each one of their lives.

References

Becker, A., Hessenius, C., Licha, K., Ebert, B., Sukowski, U., Semmler, W., ... &Grötzinger, C. (2001). Receptor-targeted optical imaging of tumors with near-infrared fluorescent ligands. *Nature Biotechnology*, *19*(4), 327.

Dougherty, T. J., Kaufman, J. E., Goldfarb, A., Weishaupt, K. R., Boyle, D., & Mittleman, A. (1978). Photoradiation therapy for the treatment of malignant tumors. *Cancer research*, *38*(8), 2628-2635.

Graves, E. E., Weissleder, R., & Ntziachristos, V. (2004). Fluorescence molecular imaging of small animal tumor models. *Current molecular medicine*, *4*(4), 419-430.

Ntziachristos, V., Bremer, C., & Weissleder, R. (2003). Fluorescence imaging with near-infrared light: new technological advances that enable in vivo molecular imaging. *European radiology*, *13*(1), 195-208.

Ntziachristos, V., Ripoll, J., Wang, L. V., & Weissleder, R. (2005). Looking and listening to light: the evolution of whole-body photonic imaging. Nature Biotechnology, 23(3), 313.

Tromberg, B. J., Shah, N., Lanning, R., Cerussi, A., Espinoza, J., Pham, T., ... & Butler, J. (2000). Non-invasive in vivo characterization of breast tumors using photon migration spectroscopy. *Neoplasia*, *2*(1-2), 26-40.

Weissleder, R. (2001). A clearer vision for in vivo imaging.

Weissleder, R., & Ntziachristos, V. (2003). Shedding light onto live molecular targets. *Nature medicine*, *9*(1), 123.

Yaroslavsky, A. N., Barbosa, J. G., Neel, V., DiMarzio, C. A., & Anderson, R. R. (2005). Combining multispectral polarized light imaging and confocal microscopy for localization of nonmelanoma skin cancer. *Journal of biomedical optics*, *10*(1), 014011.

Yodh, A., & Chance, B. (1995). Spectroscopy and imaging with diffusing light. *Physics Today*, *48*(3), 34-41.

ARTIFICIAL INTELLIGENCE

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What is AI?

[1] Artificial Intelligence is the science and engineering of creating machines which are intelligent, mainly computer programs which are intelligent.[2] Artificial Intelligence is a computing system that can engage in human activities such as learning, adapting, synthesizing, self-evaluation and using data for complicated tasks.

History of AI

[3] Early inventions in the field of electronics, some fields of engineering and other fields have raised the idea of AI. [4] Artificial intelligence was first termed in the year 1950, unfortunately due to limitations in earlier models AI was not accepted and it was prevented from entering into the field of medicine. The field of AI research was initially discovered at a workshop which was hosted on the campus of Dartmouth College which is situated in the United States of America in the year 1956. The persons who attended the event become the main leaders of AI research for decades. The prediction of many people which stated that a machine which is as intelligent as a human being would come into existence within a short period of time not more than a generation, and millions of dollars were spent on this project to make this theory true. Naturally, this became famous such that the commercial developers and researchers had dreadfully underestimated the difficulty level of this project. During the year 1973, in response to the criticism from James Light hill and the high pressure from congress, the U.S. and British Governments stopped funding the research of artificial intelligence, and the difficult years that followed would later be termed as AI winter. Seven years later, a positive move was initiated by the Japanese Government which inspired the government of other countries and other industries to supply AI with billions of dollars, unfortunately within the late 80s the investors became financially insufficient and stopped the process of funding again. The Investment and interest in AI gloomed during the initial year of the 21st century during which the process of machine learning was successfully applicable in many problems in field of academia and industry due to the new methods which were created, the application of powerful computer hardware, and the collection of massive data sets.

Growth of AI

[5] Artificial Intelligence is a boon for humans and it helps to develop the world in many aspects. [6] Artificial Intelligence also has a special feature of multitasking which makes it necessary in many fields.[7] The emerging field of AI would allow the semiconductor manufacturing companies to increase their profits nearly from forty percent to fifty percent. The storage will be at its peak and the semiconductor manufacturing companies will also capture the other digital processes such as computing, networking and storing the memory. Semiconductor companies will also find huge profits from their existing digital chips. The companies can also be profited from the product of novel technologies such as AI accelerators. Within the year 2025, AI-related semiconductors would account for almost 20 percent of all demand, which would translate into about $67 billion in

revenue. The Opportunities will begin to emerge from both data centers and the edge. Compute performance relies on central processing units (CPUs) and accelerators, graphics-processing units (GPUs), field programmable gate arrays (FPGAs), and application-specific integrated circuits (ASICs). Most compute growth will begin from higher demand for Artificial Intelligence applications at cloud computing data centers. At these areas, GPUs are frequently used for nearly all the training applications.

We can assume that they will shortly begin to lose market shares to ASICs, still the compute market is evenly divided between these solutions within the stipulated year 2025. Semiconductor companies are the primary movers in the AI space and they will be more likely to attract and retain customers and ecosystem partner sand that can the prevent later newcomers from gaining a leading position in the market. With both major technology players and startups launching independent efforts in the AI hardware space now, the gate of opportunity for supporting a claim will quickly grow small within the next few years.

AI in Healthcare Appliances

[8] AI is used in the application of wearable pressure sensors. Some other healthcare appliances which work in the principle of pressure are hearing aids, Ultrasensitive e-skin, The measurement of height and weight, Health monitoring, medical diagnosis and many more appliances. A pressure sensor usually acts as a converter that converts an imposed force into an electrical (digital) signal or other recognized signal as an output. To mark the performance of a sensing device, we require the basic data about the key parameters associated with pressure sensors. These key parameters include the sensitivity, limit of detection (LOD), linearity, response time, and stability.

Sensitivity is one of the most important factors of pressure sensors because sensitivity determines the accuracy of the measurement and efficiency of the device. The response time is also an important factor in marking the performance of pressure-sensing devices, especially which are used in dynamic real-time sensing. The response time is defined as the time consumption of a pressure sensor during response processes, from inputting pressure to producing a stable signal output. [9] Healthcare monitoring gadgets use the principle of AI. Using a computational algorithm which is based on a Convolutional Neural Network showed that the improvement of appearance and attractiveness of the patients with orthognathic treatment.

From this we can conclude thatAI can be considered a useful tool in evaluating facial alterations after orthognathic surgery. [10] AI is used in cephalometric analysis.

AI in Manufacturing and Production

[11] AI indirectly facilitates high quality and high efficiency in the industries. We can state that the intelligent manufacturing is a new type of manufacturing model and the technical means through which new information and communication technology, intelligent science and technology, large manufacturing technology (which includes design, production, management, testing, and integration), system engineering technology, and related product technology are integrated with the whole system and lifecycle of product development. The cycle of manufacturing of these products uses certain principles such as sensing, interconnecting, collaborating, learning, method of analysis, understanding, decision-making, control, and the execution of human, machine, material, and environmental information to enable the integration and optimization of various aspects of a manufacturing enterprise or group, including three elements (people/organizations, operational

management, and equipment and technology) and five flows (information flow, logistics flow, capital flow, knowledge flow, and service flow). This increases productivity and provides a high efficiency, high quality, cost-effective, and environmental-friendly service for users, and therefore improves the market competitiveness of the manufacturing enterprise or group.

[12].AI play an important role in creating machines which are intelligent and can perform tasks better. Flexible manufacturing system is a new type of manufacturing for processing various different parts with low to medium demand volume. It consists of NC machines and workstations connected by automated materials handling system which is usually controlled by one computer or more. [13]. AI provides optimal scenario in shorter span of time than the original mathematical methods in the textile industries. The immediate need for the quick exploration of a textile manufacturing process is increasing its cost along with the complications in the process. The development of manufacturing process modeling has shown its growthin attention from the textile industry. More number of researchers shifted their attention from traditional methods to the intelligent techniques for process modeling as the traditional methods require more time and it also requires more manpower which is not feasible. The section of this paper is in line with the manner of textile processes from yarn to fabrics, and then to garments. The review and discussion of the earlier studies which were conducted on different applications in different processes. The factors and performance properties considered in process modeling are collected in comparison. In terms of inputs these factors such as feature selection, modeling techniques, data distribution, and performance estimations, the considerations of the previous studies are analyzed and summarized. It can also be concluded that the issues faced by the textile industries will be solved by artificial intelligence within the next fifty years.

AI in Security and Surveillance

[14]. AI is used in malware software trafficking in the field of cybersecurity. The unique technique of AI in cyber-attacks seems to be quite interesting. The idea of a machine growing to its own knowledge through self-learning becomes advanced to attack things which are aproblem to the cyber world. Most of the time, these AI enabled cyber-attacks are made by using the advanced malwares which have advanced techniques to escape from security perimeters. Traditional cyber security methods have failed to withstand these attacks. In order to solve these issues, robust traffic classification system using Principal Component Analysis (PCA) and Artificial Neural Network (ANN) is proposed for providing extreme surveillance. [15]. Automatic Theft detection is used in smart banks which is based in the principle of Artificial Intelligence. In a CCTV based theft detection along with tracking of thieves, we use image processing to detect theft and motion of thieves in CCTV footage, without the use of sensors. This system focused on object detection. The security person will receive the notification about the suspicious individual committing burglary using real-time analysis of the movement of any human from CCTV footage and thus gives a chance to avert the same. [16].AI is used in automatic detection of weapons and also in recognizing weapons.There is absence of manpower in the security area and average performance of human may result in unknown dangers or delay indetection of threats, which are highly risky for the public. Taking this into action, various parties have created real-time and automated solutions for identifying risks based on surveillance videos. The purpose of this work is to develop a low-cost, efficient, and artificial intelligence-based solution for the real-time detection and recognition of weapons in surveillance videos under different cases.

AI in Education

[17]. For the past twenty years computers have been used in the field of education. Intelligent tutoring systems seemed to have increased the performance of the students and also highly motivated the students. [18]. The AI software would be created by the institution or a company and the AI software would be primarily used by the students. [19].AI has been a solution for a number of problems. AI has some applications in the field of education such as visualizing graphs, explaining the power of personalization and few more.

Advantages of AI

[20]. For the past twenty years computers have been used in the field of education. Intelligent tutoring systems seemed to have increased the performance of the students and also highly motivated the students. [21]. The AI software would be created by the institution or a company and the AI software would be primarily used by the students. [22].AI has been a solution for a number of problems. AI has some applications in the field of education such as visualizing graphs, explaining the power of personalization and few more.

Disadvantages of AI

[23]. The primary disadvantages of AI are increasing unemployment and mass scale destruction can be created if used by wrong people. [24]. The price of these machines is high so if it fails to work efficiently then it is a huge loss. [25]. Many universities are not aware of the application of AI in the field of teaching. [26]. Though AI has the potential to think like AI but it cannot replace a human because it does have any emotions or feelings. [27]. The time elapsing is not enough as the creation of relevant technologies and deficiency of current computer science is deepening and computer science became more complicated.

Conclusion

We can conclude that Artificial Intelligence is either a boon or a burden for man beings. From one point of view we can state that artificial intelligence is a boon in the field of education as it has increased the progress of students which is a boon. It can also be stated as a burden in the field of industry as it is responsible for the unemployment of humans which is a very serious issue since its birth and it has also increased the productivity of the industries.

We, humans have created technology which is very comfortable for us. This technology is our servant but it should be served by us. According to some anonymous sources, the present industries consist of seventy one percent of humans and twenty nine percent of machines and in future forty nine percent of the industry will be compromised machines. This fact is good from the point of view of advancement in technology but bad from point of humanity as the unemployment will rise. In last, we can state that no matter how good AI is, it is equally deadly. I would like to thank my professor Dr. Karthikeyan for assigning this topic to me, I learned many new things during the research of this topic.

References

Aiken, R. M., & Epstein, R. G. (2000). Ethical guidelines for AI in education: Starting a conversation. International Journal of Artificial Intelligence in Education, 11, 163-176.

Arivudainambi, D., KA, V. K., &Visu, P. (2019). Malware traffic classification using principal component analysis and artificial neural network for extreme surveillance. Computer Communications, 147, 50-57.

Batra, G., Jacobson, Z., Madhav, S., Queirolo, A., & Santhanam, N. (2019). Artificial-intelligence hardware: New opportunities for semiconductor companies. McKinsey and Company, January, 2.

Beck, J., Stern, M., &Haugsjaa, E. (1996). Applications of AI in Education. XRDS: Crossroads, The ACM Magazine for Students, 3(1), 11-15.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. Aayushi International Interdisciplinary Research Journal, 227-230.

Bouletreau, P., Makaremi, M., Ibrahim, B., Louvrier, A., &Sigaux, N. (2019). Artificial intelligence: applications in orthognathic surgery. Journal of stomatology, oral and maxillofacial surgery, 120(4), 347-354.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. Ai Magazine, 26(4), 53-53.

Chowdhury, M., &Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Davies, H. C., Eynon, R., &Salveson, C. (2021). The mobilisation of AI in education: A Bourdieusean field analysis. Sociology, 55(3), 539-560.

Guo, M. Advantages And Disadvantages Of Artificial Intelligence In Business English Teaching.

Kakadiya, R., Lemos, R., Mangalan, S., Pillai, M., &Nikam, S. (2019, June). Ai based automatic robbery/theft detection using smart surveillance in banks. In 2019 3rd International conference on Electronics, Communication and Aerospace Technology (ICECA) (pp. 201-204). IEEE.

Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine. Gastrointestinal endoscopy, 92(4), 807-812.

Khanzode, K. C. A., &Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. International Journal of Library & Information Science (IJLIS), 9(1), 3.

Kök, H., Acilar, A. M., &İzgi, M. S. (2019). Usage and comparison of artificial intelligence algorithms for determination of growth and development by cervical vertebrae stages in orthodontics. Progress in orthodontics, 20(1), 1-10.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. Frontiers of Information Technology & Electronic Engineering, 18(1), 86-96.

McCarthy, J. (2007). What is artificial intelligence?.

Mital, A., & Anand, S. (2013). Handbook of expert systems applications in manufacturing structures and rules. Springer Science & Business Media.

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Popenici, S. A., & Kerr, S. (2017). Exploring the impact of artificial intelligence on teaching and learning in higher education. Research and Practice in Technology Enhanced Learning, 12(1), 1-13.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Viscaino, M., Bustos, J. T., Muñoz, P., Cheein, C. A., &Cheein, F. A. (2021). Artificial intelligence for the early detection of colorectal cancer: A comprehensive review of its advantages and misconceptions. World Journal of Gastroenterology, 27(38), 6399.

Woolgar, S. (1985). Why not a sociology of machines? The case of sociology and artificial intelligence. Sociology, 19(4), 557-572.

Xu, S., & Hung, K. (2020, April). Development of an ai-based system for automatic detection and recognition of weapons in surveillance videos. In 2020 IEEE 10th Symposium on Computer Applications & Industrial Electronics (ISCAIE) (pp. 48-52). IEEE

Xu, Y., Thomassey, S., & Zeng, X. (2018). AI for apparel manufacturing in big data era: A focus on cutting and sewing. In Artificial Intelligence for Fashion Industry in the Big Data Era (pp. 125-151). Springer, Singapore.

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. Materials Horizons, 2(2), 140-156.

Zhao, Y., Li, T., Zhang, X., & Zhang, C. (2019). Artificial intelligence-based fault detection and diagnosis methods for building energy systems: Advantages, challenges and the future. Renewable and Sustainable Energy Reviews, 109, 85-101.

CLOUD COMPUTING SECURITY

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Abstract
In this paper, we have focused on cloud computing security and to develop the data security. Cloud computing security is one of the technologies which is fast developing and also should be developed in case of security. Recent technologies and people demand more security for data which they want to store safely in some forum. So, cloud computing must be secure enough to store data. Virtualisation is the key aspect which works behind the cloud security. We have even discussed the advantages of cloud computing along with the security issues faced by the users. You can even find out about the security operating organization which ensures the security of data to some extent.
Keywords: virtualization, scalability, infrastructure, cloud service providers, storage security.

Introduction

Cloud computing security often referred to as cloud security is a set of policies and control-based technologies that protect any kind of data, application and the infrastructure related to the data of cloud computing. Like internet service is provided by Internet service providers (ISP), this cloud service is provided by the cloud service providers (CSP). It gives us a platform for the user to get access to the cloud computing in a very efficient way. With this cloud computing, the client can easily communicate with server-side application or service by the use of the internet infrastructure. The security process i.e. the process of protecting the data from the unknown user involved here is mainly controlled and managed by the IaaS (Infrastructure as a service).

Cloud computing mainly focus on IT sector and most business fields, as no special hardware is required; updates and patches are very fast, as they are directly done by the virtual server over a secure internet connection. It also helps an individual to work and transform data remotely from any corner of the world.

However, we people do not own the infrastructure physically, still, we can access those resources by paying a subscription fee or some without a fee. The main thing behind this is basically to reduce the burden of paying money for the software licence, the storage hardware and other things like e-mail, etc. as the whole resource is provided by the cloud service provider. So this makes the cloud computing more users friendly.

As soon as the introduction of cloud computing took place, there was a massive reduction in the budget by about 18% in the IT sector, while data centre power costs got reduced by 16%.

Literary Survey

[1]This cloud computing is the communication between the server and the client. This service is provided by the CSP i.e. cloud service provider. There are many technologies like cloud computing but there are 5 aspects that make it more advantageous than other. Those are (i)Multitenancy, (ii)Massive scalability, (iii)Elasticity, (iv) Pay as you go, (v)Self-provisioning of resources. Cloud

computing is initiated by three different models Public Cloud-It involves the usual thing like the default one. Second is the Private cloud- it allows the user to build how the information is stored. The third is the Hybrid cloud- it includes both the private and the public in the same interface. The main thing is that the CSP must intimate every facility and tell every user about the deployment in it.

[2] Cloud security is the main key for the cloud success. There are two technologies which are mainly used in cloud computing, one is the Multi-tenancy and second thing is the virtualization. IaaS (Infrastructure as a service) is mainly dependent on the virtualization technology. This enhances the security and isolation process in the cloud computing. Multi-tenancy can be achieved through the use of the virtualization. The thing is virtualization allows the user to run any OS (operating system) on the same physical device. Cloud computing has 2 types of virtualization Para-virtualization and full virtualization. The notable difference between these two things is the full virtualization; the complete system has to be emulated. But for the paravirtualization modification is done to OS so that the work is performed easily.

[3] The security issues in cloud computing which came into limelight because of certain academics and black hats were considered as fundamentally new but it is relative to the traditional way of cloud computing and these kinds of problems already received attention. Even though after the exponential growth of cloud computing still the security issues in cloud computing possess as a threatto its development. In the present economic case even, the security issues will not prevent it from becoming a consumer commodity. Cloud computing forms the basis for large-scale computation business. Cloud computing made large-scale computations become universally accessible, affordable, and useful.

[4]Cloud computing is considered the latest and exponential growing technology as seen in the past few years. It gives a user to access their data cheaply with minimum cost to increase their potential in data storage. The user can assess their data through the network. There is increasing concern about the security along with the development of cloud across the world. As it exposes the secrets of different companies and industries to the wrong hands which affect them a lot. Their self-reputation could also be damage it exposes to the public. In some, the organisation could not access to their own data but gets spread with many copies. For this, a security organisation is present to ensure the security i.e., Information Technology Infrastructure Library (ITIL). This helps the user to be safe up to a limit but not completely.

[5] With cloud computing, the IT field has reached higher limits in data storage with less cost. While the concern of security arises when an individual goes deeper into the data storage and programming which could be revealed to the public. Cloud computing offers a user to store their data with a reasonable lower cost. It is a service orientated application with the aim of helping the people but it should have security. Cloud can be classified into different types -public cloud, private cloud, and hybrid cloud. Cloud is further divided on the basis of delivery models – infrastructure as a service (IaaS), software as a service (SaaS), platform as a service (PaaS). For the cloud to be user-friendly it should have certain security requirements such as identification and authentication, authorisation, confidentiality, integrity, non-reputation, and availability.

[6] Cloud computing is a platform providing the user with the service through the internet in storage, implementation. It helps in saving the time and cost for the institution. It helps in the improvement of the hospital, banking, and many industries. The data of the user is stored by data centres such as Microsoft, Amazon, Google, and Salesforce. Some of the problems faced by the cloud are leaking of data, resource sharing, availability of data and so on. It gives demand for access

for the users in helping store their data such as photos, videos, etc. there are plenty computing issues as it deals with system operating, scheduling of resources, networks, database, etc. various concerns in security are – data location, data availability, data transmission, data segregation, application and server access.

[7] Cloud computing is regarded as the latest technology in the IT field. In the previous generations, the means of storage is by physical means (hardware) but cloud gives a user to save the data in software means which allows the user to use it from any corner of the world provided there is the availability of the network. There are different types of problem statements such as- system models, adversary model, design goals, notation and preliminaries. The users must ensure that the data that they have stored is secured and not exposed locally. This could be for several reasons maybe the server maybe right or the there are people who will hack the cloud of others. During storage correctness, we could identify data corruption (the servers who are misbehaving could be identified.

[8] As a matter of fact, technology is more boon than bane for the society. Cloud computing is one of the fast-emerging technology in the world. However, one must be cautious and vigilant enough to understand the security issues and challenges faced while using this technology. Few frequent challenges faced are data loss, phishing etc. While this comes as a challenge for many IT companies and Corporates as data is stored ona hard disk without knowledge of how the secure the information is passed and stored. Widely faced security issues are most frequent in public cloud. Generally, cloud consists of three commonly used domains public cloud, private cloud, hyb90-rid cloud. Hybrid cloud is something that uses both public and private clouds, they generally used by IT companies. AS we look into statics provided we can clearly note that issue of security stands on first with 74.6% then stands performance on second with 63.1%. When it comes to hackers they use the cloud as a platform for botnet as cloud services are a low investment for them to do their work. In this paper, you can know the key factors that cause this issue are well described.

[9] In this fast advancing global world, cloud computing plays a major role in the digital platform. On the other hand, there is a great threat to this fast emerging service, that is security. So, one must be cautious enough while using this technology, as no one knows where the information is stored, how securely it is stored and transferred during the time of access by the individual. The technical issue arises when the user's data has to be released by the cloud in order to reach the user, this issue arises. Whether the data is transferred securely or data leaks may have taken place while sending to the user's server. You can also know the varied reasons that there behind this technical issue in cloud computing.

[10] The main aim of this article is to classify and organise the main security concerns that are associated with cloud computing, also helps in finding concerns that are unanswered. In this article, you can know information related to cloud security references mentioned below - network security, transfer security,firewalling, security configuration. The three fundamental security principles that play a major role in the security of cloud are compliance, privacy, architecture. CSA is an organization which helps in providing security for the cloud computing platform.
    1

Findings

Cloud computing is regarded as the fastest, accessible and conventional means of storing data to the users via the internet. It replaced hardware to software which brought a huge profit to the IT industry not only in case of money but also in time consumption as a user can access their data from any

corner of the world provided there is a good bandwidth. Cloud computing is facing a series of challenges such as the hacking, phishing etc. It is facing a great issue as it exposes the identity and privacy to the public. The security of the cloud must be increased and strengthened drastically so that no hacker can access the valuable data of the user and ensure the privacy of the users. There are institutions that ensure the security of these but it is still not up to the mark. There are technologies like virtualization and Multi-tenancy which is used to develop the cloud security and its interface. These are developed in order to increase the data security and isolation process.

Conclusion and Recommendation:
One can infer details about cloud computing and mainly its security. The cloud service is provided by the CSP i.e. cloud service provider. The main focus is to improve and ensure cloud computing security. Virtualization and Multi-tenancy are the key technologies that are used to develop and run the cloud security. The users must understand more about the cloud and must know about its transparency which avoids up to a certain extent. So, we recommend the cloud servers to increase the security of the cloud to make the cloud service a more user-friendly. Two-factor authentication or multi-factor authentication should be practised to protect the data. Cache and cookies should be cleared frequently, passwords should never be auto-saved in a pc.

References
Carlin, S., & Curran, K. (2013). Cloud computing security. In Pervasive and Ubiquitous Technology Innovations for Ambient Intelligence Environments (pp. 12-17). IGI Global.
Chen, Y., Paxson, V., & Katz, R. H. (2010). What's new about cloud computing security. University of California, Berkeley Report No. UCB/EECS-2010-5 January, 20(2010), 2010-5.
Gonzalez, N., Miers, C., Redigolo, F., Simplicio, M., Carvalho, T., Näslund, M., &Pourzandi, M. (2012). A quantitative analysis of current security concerns and solutions for cloud computing. Journal of Cloud Computing: Advances, Systems and Applications, 1(1)
Mishra, A., Mathur, R., Jain, S., & Rathore, J. S. (2013). Cloud computing security. International Journal on Recent and Innovation Trends in Computing and Communication, 1(1), 36-39.
Padhy, R. P., Patra, M. R., &Satapathy, S. C. (2011). Cloud computing: security issues and research challenges. International Journal of Computer Science and Information Technology & Security (IJCSITS), 1(2), 136-146.
Popović, K., &Hocenski, Ž. (2010, May). Cloud computing security issues and challenges. In MIPRO, 2010 proceedings of the 33rd international convention (pp. 344-349). IEEE.
Ramgovind, S., Eloff, M. M., & Smith, E. (2010, August). The management of security in cloud computing. In Information Security for South Africa (ISSA), 2010 (pp. 1-7). IEEE.
So, K. (2011). Cloud computing security issues and challenges. International Journal of Computer Networks, 3(5), 247-55.
So, K. (2011). Cloud computing security issues and challenges. International Journal of Computer Networks, 3(5), 247-55.
Wang, C., Wang, Q., Ren, K., & Lou, W. (2009, July). Ensuring data storage security in cloud computing. In Quality of Service, 2009. IWQoS. 17th International Workshop on (pp. 1-9). Ieee.

ARTIFICIAL INTELLIGENCE THE FUTURE OF LEARNING

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What is Artificial Intelligence?

[1] Artificial Intelligence is the duplication of human intelligence processes by machines. It is the technology of making updated machines, updated computer programs. It is developed to connect human brain with computer intelligence and work more efficiently than humans .There are three types of artificial Intelligence 1. Artificial Narrow Intelligence 2. Artificial General intelligence 3. Artificial Super Intelligence. AI is leading many industries whit its advanced technology. The future with artificial intelligence is easy .AI works by gathering large amount of data with fast, reiteration processing and intelligent algorithms. But AI does not have to restrict itself to methods that are biologically observable. Artificial intelligence is opposed to natural intelligence. [2] The aim of Artificial Intelligence is to identify and solve manageable information deal with problems. AI is a field in computer science. It is a intelligent technology used to develop the computer programming. artificial intelligence is making our everyday life more efficiency and easy to live. Artificial intelligence includes manufacturing robots, self driving cars, smart assistance, disease mapping, social media monitoring, active healthcare management, machine learning, etc... Applications of Artificial Intelligence include natural language processing, speech recognition and machine vision. Artificial Intelligence is widely used to provide personalized guidance to people.

History of Artificial Intelligence

[3] In the history AI are treated to philosophy and imagination. John McCarthy is the father of artificial intelligence .The further inventions in electronics and many other inventions impact on Artificial Intelligence. The first work on Artificial Intelligence was done in 20th century by the British logician and computer explorer Alan Mathison Turning. Lovingly was the first AI robot developed by Shakey from 1966 to 1972 it can do any tasks without step to step instructions .At a conference at Dartmouth college , in Hanover ,New Hampshire the name Artificial Intelligence was coined . [4] AI was first developed in 1950's. From 1974 some governments started funding AI to develop their country in the way of technology several inventions were discovered on AI in 1950's. later in 2000's this inventions are overcome by the new technologies. Now AI is capable of understanding complex algorithms and self learning. Japan is the country that is well developed in Artificial intelligence. Artificial Intelligence can be applied in medical field were humans can't solve the problem .By the gradual development Artificial Intelligence it can do the things which humans can't do. Artificial Intelligence was discovered to match the human thoughts with machines. Artificial Intelligence will be the future of Learning.

Artificial Intelligence in India

[5]India was ranked eighth in the top 10 countries by AI patent families in global level. Artificial Intelligence practices benefit India in addressing social needs in sectors such as healthcare education, agriculture, smart cities and infrastructure and transportation. Tata Elxsi is leading artificial intelligence in India. The career in AI is very good in India the AI salary is much higher than the national average salary. In the starting of the 21st century Artificial intelligence has great

boom due to its advanced technology in India. Artificial Intelligence is one of the most trending and competitive field in the present days. It s used by the many of the leading companies today. The growth of AI is increasing day by day. The introduction of Artificial Intelligence into the national economy system is huge and cannot be limited to only some companies. The growth of artificial intelligence from 2020 to 2021 is 28.4%. The global AI software is expected to grow 54% every year. [6] Artificial Intelligence is considered to be the fourth industrial revolution. Artificial Intelligence with its intelligence technology transformed all industries around the world. AI refers to the link of human or animal brain to the computer technology. Artificial Intelligence is making the humans work free. AI taking the works which are dangerous for humans to do. According to 2019 reports applications for AI have grown 270% in four years. Artificial Intelligence machines takes less time than the humans to perform a task. Gradually AI machines are occupying the places of humans in any work.

Artificial Intelligence in Healthcare Appliances
[7] Artificial Intelligence is gradually changing the medical experiments with recent development in the machine learning and computing infrastructure. Artificial Intelligence is used in the areas which previously were deal by the human experts. Now with help of AI many medical experiments were done. Current applications of Artificial intelligence in healthcare includes data extraction from text narratives, predictive algorithms and clinical decision support. [8] Artificial Intelligence aims to imitate human analytic functions .it is bringing ideal shift to health care, by increasing the availability of health care data and fast progress of techniques .Artificial Intelligence have saved many lives with its advanced technology. Many healthcare appliances are created by the technology of artificial intelligence for medical uses. Artificial Intelligence is performing the operations which humans can't perform. Artificial Intelligence with its advanced technology is able to cure many kind of disease. [9] Artificial Intelligence is not a single technology but collection of technologies. Most of these technologies are used in the development of health care appliances. The Artificial Intelligence supports medical field widely. Artificial Intelligence is used in healthcare appliances as managing medical records and other data, doing repetitive jobs, treatment design, medication management, drug creation, digital consultation, virtual nurses, precision medicine, etc..

Artificial Intelligence in Manufacturing and Production
[10] In the present days the manufacturing and logistics systems are supported by well developed computer technology within these technology large amount of data being generated by sensors, machines, systems and people. Artificial Intelligence is leading many of the manufacturing companies. Artificial Intelligence is helpful in making better product design, efficiency of the product and good quality of the product. Artificial Intelligence can ensure the safety of employees. [11] Artificial Intelligence can reduce the time of production and can also reduce the working time of humans .Manufacturing Industry is the keystone of the national economy, peoples everyday life and national security .Artificial Intelligence helps machines to gather more information, finding new ideas , to create new things . AI helps in finding product or equipment failure in advance to prevent the breakdown of the product. By promoting error free sensor technologies and progress of computing methods to lead of intelligence, the use of intelligent manufacturing process has been made possible. [12] Creativity and modification are important to the manufacturing industry, AI machines can help in creating the better product with more efficiency .AI can benefit the manufacturing industry by finding the failures easily and can easily solve the problem. This

development should lead to improvement in the new technologies in the manufacturing.AI is used in developing the methods used in the manufacturing. Big data and AI give a huge boost to manufacturing industry. Software solutions can use the high volume of data generated by a factory to identify regions with similar or repeating characteristics that can be used to make manufacturing process more efficient and reduce their energy consumption.

Artificial Intelligence in Security and Surveillance

[13] There are number of ways in which AI is used in security and surveillance the intelligent technology in Artificial Intelligence is used in security surveillance in many developing cities. It is used in many leading companies in security. Most of the developed countries are using the security cameras that work based on AI. Artificial Intelligence can be used in national security especially in three areas 1.militiary 2.information and 3.economy. in the military AI is used in making the new capabilities and making the existing capabilities more powerful. [14] Artificial Intelligence is used in finding the terrorists before they are planning to do any attacks. Terrorism depends on surprise in its attacks, terrorists attacks are not random they are very difficult to track. Before the attack terrorists plane and prepare by selecting the target and training executors and traveling to the targeted country .AI is used in finding the terrorists activities and in security of the specific country. AI is helpful in preventing the terrorist attack. [15] Surveillance cameras have excess of usage in every developing cities. There are no place without security cameras security is one of the main thing in every country. With advanced technology every county is trying to improve their security systems. AI is capable of identifying cyber threats and solve them with human interference. AI is used in smart traffic, healthcare, monitoring, and in security needs. Some countries like china, Saudi Arabia have their security robots. AI is used in security such as vehicle bomb detection, home security, threat screening for big events, crime prevention cameras, Military reconnaissance, border control, oil and gas threat detection, infectious disease detection, etc.....

Artificial Intelligence in Education

[16] Artificial Intelligence is making many changes in the education system. We cannot say that AI does not have any impact on Education system. Artificial Intelligence is one of the most developing technological force in the present days and changing many industries and influencing the education system and implementing new ways in learning. It is adding embedded skills, character and good learning in education system. The way of learning is changing by the artificial intelligence by implementing better ways in teaching and learning. Many of the students are interested in learning the Artificial Intelligence. [17] The field of Artificial Intelligence has done many changes and development over the past twenty five years in education system. It created many new opportunities in many fields. It is one of the trending course in the education system. AI helps a student and find outs what does he want to learn and helps in learning which the student is interested. Artificial Intelligence helps the students in making personalized schedule in their learning. Most of the students prefer Artificial Intelligence as their specialization in any course. [18] There are many benefits of AI in education better engagement, curriculum automatic creating, opportunity to find a good teacher. AI helps students in many ways students can receive some more personalized tutoring, technology can present the material for student in a understandable way, AI helps educators identify, learning disabilities, AI helps students to give reliable feedback. The field Artificial Intelligence is producing new technique and learning methods .some students are working on artificial intelligence and gaining some knowledge in the field of artificial intelligence.

Advantages of Artificial Intelligence

[19] Artificial Intelligence takes the less time to do a task as compared to time taken by the humans to do .AI can work 24 by 7 without breaks without extension of time .Artificial Intelligence can take faster and own decision and make the work faster and smarter .AI can take risks instead of humans . AI produces more powerful and more useful computers .Artificial Intelligence applications are used in human intelligence for solving problem or decision making. AI is used in the many of the leading companies and industries. AI is making many changes and development in the technology .AI is applied in engineering, economics, law, manufacture, medicine, modeling, etc... [20] Artificial Intelligence come a long by making many changes in the technology. The term Artificial intelligence was introduced as a 'digital' replacement for the analog 'cybernetics'. George Boole ,Allen Newell and Herbert Simon were founded the first artificial intelligence laboratory. Artificial Intelligence reduces the human errors in any work .AI solutions can help companies to respond to customer queries and solve the customer problems very quickly. [21] Colorectal cancer is the second most dangerous cancer in the world marked in 2020 due to unrefined mortality rate of 12.0 per 100000 inhabitants. It can be prevented if glandular tissue is detected early. Due to development in technology glandular tissue is detected early by using advanced machines. Artificial Intelligence have a greater impact in medical field any kind of disease and virus can be detected early and can be cured easily. The use of artificial intelligence in the medical sector is becoming more important day by day AI performs clinical diagnoses and suggest treatments quickly without requiring the patient to visit the hospital. [22] with the rapid growth of mobile devices and a wealth of rich application services , the internet of vehicles has struggled to handle mathematically intensive and delay in completing the computing tasks. In the resent days mobile devices are rapidly moving towards intelligence to satisfy the mobile users the internet of vehicles is converting into intelligent vehicle internet. Artificial Intelligence is impacting the future of every industry and every human. Artificial Intelligence is the main thing in the development of technologies like big data, IOT, etc...[23] with the advance development in information technology by using cyberspace cybercrimes are increasing day by day .computers and human involvement are not sufficient for protecting the people from cyber crime so there should be advanced machines to stop cyber crime it is possible through artificial intelligence. Biologically inspired computing methods of artificial intelligence have been playing important role in preventing cyber crime.

Challenges or Disadvantages of Artificial Intelligence

[24]Artificial Intelligence comes with a high cost as it is a complex machine apart from installation cost it's repair and maintenance cost is huge. AI is smarter than humans but cannot perform emotions and moral values. they don't know what is ethical is what is legal they don't have their own judgment making skills. In the continuous improvement of artificial intelligence and smart technology AI has developed in a very large way. It is also changing the students traditional learning methods and it is also changing the teaching methods of teacher. Artificial intelligence has a very big impact on the education system. [25] Artificial Intelligence overcoming the ways of natural intelligence. Artificial intelligence is overcoming the human intelligence and making humans lazy and not make them working .Artificial Intelligence cannot improve their experience they can perform the same task again and again. Machines can't think creative, they can perform only what they thought even if they help in designing and creating they can't match the power of human brain. If machines are replaced by the humans, humans lose their job which leads to unemployment the

reason of GDP stable or not growing is because of unemployment. [26] Artificial Intelligence is developing in all areas of humans from the last 10 years. Those who study the robots and artificial intelligence in their education have very big impact in their life. Isaac Asimov has already told us about the dangers of using artificial intelligence in daily life. the general application of artificial intelligence in field of education is very dangerous and should be studied in deep. The companies with AI has a boosting accuracy of 90% but human can have a accuracy of 99%.[27] it is not easy to develop the machines as the equipment is so expensive. It costs so much money and so much time to create a machine and repair it. By using robots in place of humans can cause severe unemployment. machine can be easily destroyed if we put in wrong hands. It is making server changes in the government. All the machine learning models are based on data we have enough date to train them but these data is generated from millions of users around the world, there is a chance that this data can be used for bad purpose. [28] AI is making humans lazy and humans are not doing the work ,in place of humans robots are doing work .every industry is looking for exchange of robots in place of humans which may do similar work with more efficiency. But it cannot replace the human connective work. Machines cannot make a bond with humans when involves team work. If there is a repair in a machine it may lose the information stored in it. Artificial Intelligence is making human life dangerous day by day.

Conclusion

Artificial Intelligence can change the world in the future with its advanced technology. Many industries are developing rapidly because of Artificial Intelligence. Artificial Intelligence is the main factor in the growth and development of a country. Many of the student are interested in learning Artificial Intelligence. Artificial Intelligence is the future of learning. The methods of teaching and learning are changed due to artificial intelligence. There are many advantages and disadvantages of artificial intelligence.

References

Abdulov, R. (2020). Artificial intelligence as an important factor of sustainable and crisis-free economic growth. *Procedia Computer Science*, *169*, 468-472

Baker, M. J. (2000). The roles of models in Artificial Intelligence and Education research: a prospective view. *Journal of Artificial Intelligence and Education*, *11*, 122-143.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Chen, H., & Wang, F. Y. (2005). Guest editors' introduction: Artificial intelligence for homeland security. *IEEE intelligent systems*, *20*(5), 12-16.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Cioffi, R., Travaglioni, M., Piscitelli, G., Petrillo, A., & De Felice, F. (2020). Artificial intelligence and machine learning applications in smart production: Progress, trends, and directions. *Sustainability*, *12*(2), 492.

Davenport, T., & Kalakota, R. (2019). The potential for artificial intelligence in healthcare. *Future healthcare journal*, *6*(2), 94.

Dilek, S., Çakır, H., & Aydın, M. (2015). Applications of artificial intelligence techniques to combating cyber crimes: A review. *arXiv preprint arXiv:1502.03552*.

Eldrandaly, K. A., Abdel-Basset, M., & Abdel-Fatah, L. (2019). PTZ-surveillance coverage based on artificial intelligence for smart cities. *International Journal of Information Management*, *49*, 520-532.

Ghimire, A., Thapa, S., Jha, A. K., Adhikari, S., & Kumar, A. (2020, October). Accelerating business growth with big data and artificial intelligence. In *2020 Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC)* (pp. 441-448). IEEE

Guo, M. Advantages And Disadvantages Of Artificial Intelligence In Business English Teaching.

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education. *Boston: Center for Curriculum Redesign*.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., & Scharre, P. (2018). *Artificial intelligence and international security*. Center for a New American Security.

Ji, H., Alfarraj, O., & Tolba, A. (2020). Artificial intelligence-empowered edge of vehicles: architecture, enabling technologies, and applications. *IEEE Access*, *8*, 61020-61034.

Jiang, F., Jiang, Y., Zhi, H., Dong, Y., Li, H., Ma, S., ... & Wang, Y. (2017). Artificial intelligence in healthcare: past, present and future. *Stroke and vascular neurology*, *2*(4).

Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine. *Gastrointestinal endoscopy*, *92*(4), 807-812.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Marr, D. (1977). Artificial intelligence—a personal view. *Artificial Intelligence*, *9*(1), 37-48.

McCarthy, J. (2007). What is artificial intelligence?.

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In *Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At*

Mohammadi, V., & Minaei, S. (2019). Artificial intelligence in the production process. In *Engineering tools in the beverage industry* (pp. 27-63). Woodhead Publishing

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education*, *26*(2), 582-599.

Tao, B., Díaz, V., & Guerra, Y. (2019). Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher. *Arctic Journal*, *72*(12), 30-50.

Teng, X. (2019, April). Discussion about artificial intelligence's advantages and disadvantages compete with natural intelligence. In *Journal of Physics: Conference Series* (Vol. 1187, No. 3, p. 032083). IOP Publishing.

Viscaino, M., Bustos, J. T., Muñoz, P., Cheein, C. A., & Cheein, F. A. (2021). Artificial intelligence for the early detection of colorectal cancer: A comprehensive review of its advantages and misconceptions. *World Journal of Gastroenterology*, *27*(38), 6399.

Yu, K. H., Beam, A. L., & Kohane, I. S. (2018). Artificial intelligence in healthcare. *Nature biomedical engineering*, *2*(10), 719-731

CYBER HACKING

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Abstract
Living in a world where the technology is booming the world, where there is no need to worry for the present or the future and has many advantages compared to the past decades, it has also given people the power to use it for the right as well as the wrong. The wrong has also been increasing drastically over the period of time. They are the hackers who try to exploit the cyber network constantly and degrade the trust that the legitimate user have no the advancement in it and the dependency is deteriorating drastically.
Keywords: *hacking, illegal access, cyber crime, protection, awareness*

Introdution

Hacking means steeling of personal data in an unethical way without the knowledge of the individual. Hacking refers to identifying the weakness of the computer. It also allows to access the personal data which is secured. It also refers to modifying the computer software and hardware to complete a goal that an "individual requires". Those individuals who require the personal data of an individual or an organisation are known as "hackers".

Hacking is considered to be both a boon and bane to the society. Ethical hacking is a boon for the society .Ethical hacking means identifying the weakness of the computer and to upgrade the weakness of the computer. There is other kind of hacking known as unethical hacking which is a bane for the society. Unethical hacking means to known the personal data of a particular individual or organisation without the knowledge of the user.

Literary Review

[1] Cyber terrorism is one of the major problems which the world is facing as there is advancement in technology and use of it. It has many reasons for it to be one of the most opted and learnt among people. Few are for money, power, fame and to access information. The millennium bug has become an increasing threat to the organizations who lose all their originality. Hackers may also target individuals or groups to obtain what is desired by them.

[2] Over the past decades there has developed more problem on cyber terrorism. Much before there had been great about the cyber terrorism, including stated fear about their computer that about the hacking. The fear become more by the problem often referred to as the millennium bug by those to dramatize the threat. Despite the fat that these fears have yet to got matched with real fears and real event, in reality when we take the issue of terrorism the danger of cyber terrorism is always is on the top of the list of the social fears. From this there will be large number of deaths and lot of damage to the nation. That same is true for the cyber terrorism. However, there is a little concrete of the terrorism preparing to use the computer as a tool for harming the people. This may hurt the people and public. The hacker orders the person to do illegal things so that the hacker will be happy.

[3] This paper gives us information about the various awareness programmes and defensive methods practiced or taught to people for better knowledge about the network security and the precautions to be taken when and if you are caught up in any such situation. There are also various competitions held such as cyber defense competitions which helped them understand the situation better and also spread this to many more institutions for the betterment of the world to face a positive cyber environment.

[4]Cyber physical system is a organisation which aims at regulating the physical environment in which people work. There are many steps and challenges faced by the CPS in maintaining a better cyber world. Few of them are monitoring the exchange of various information, integrating with other organisations for better security, providing authenticity, checking on denial of service attacks which are the most frequent of all the issues which is done just for fun also. Even snooping and eavesdropping ,which are the basic of all the issues, come under network security. These organisations face a lot of challenges in their work of maintaining a secure environment for its legitimate users and have developed a framework to ensure the same**.**

[5]This paper talks about the various cyber crimes done by people using unlawful acts where the computer is a tool or a target or used as both. Some of them are cyber stalking, spoofing, gambling, snooping into other peoples emails, personal accounts and installing trojan horses onto pc's of other people to continue the process. It also discusses the preventive methods which are to be taken like using firewalls, antivirus softwares, etc. There are also methods to detect the intrusions which are discussed in the paper. It also mentions the work of the Cyber law of India which was passed in the year 2000 and their response to the crimes being carried out.

[6]Now a days there is much more importance for the data they have in the companies. The data which they have can be used in ethical way as well as in the unethical way. If everyone is ethical then there will be more job opportunities in any field. In the most of the companies there are more requirements for the job that deals with the data protection. Giving security for the data is a relatively a lastest development that requires each and everybody involved to make it work.in those companies many of the information professionals use their skills to protect the data what they have. Hacking is usally done to steal the data of any company or an organization and make an advantage of it and earn money of it. Some of the professionals use this data in unethical way to avoid the payments for the required services .this is not only unethical but also it is a crime and it is banned in many of the countries.

[7] The security to be provided mainly focuses on the availability, integrity and confidentiality of the information of its users. It tracks its illegal users by using the TCP/IP protocol where the IP address is used for back tracking and it allows the incharge people to get the person who has been involved in such activities. Damage caused due to such practices leads to huge loss for the huge multinational companies , damage to their reputation and many more. The problem may also be because of the use of poor secured code and the carelessness of the company or the organisation undergoing the loss.

[8]Cyber attacking has been increasing in a fast rate where they disrupt the normal functioning of the network due to malicious network events and other intensions such as the greed for money, acquiring of the information of others illegally. Some of them create user-friendly softwares which get directly downloaded on to the desktop directly and do the backend server upload work, just like trojan horses and corrupt the other files and softwares on the same MAC address also which leads to the total control in the hands of the attackers.

[9]Cyber hacking is palying now a dominated role in the society.even a small thing that was done using technology can be known by this cyber hacking.we are watching different situations everyday in megacities like Hyderabad Mumbai Delhi Chennai etc . The police making efforts to stop cyber hacking and they are even reducing it but not in a large scale . Recently in Hyderabad situation took place with the help of Cyber hacking the hacked server of a big IT company stole the company data and sold it to other IT companies for huge amount. It took almost 15 to 20 days to catch that cyber hacker by the police. Like this many incidents are taking place in our day to day life and this server hacking is increasing day by day. The former President of America Barack Obama said that a company's economy depends on the cyber security of the country.

[10] This paper discusses about the various denial of service attacks such as denying the right to access the information, denial of access to applications by blocking the site, denial of access to a website by sending unwanted messages to it, denial of access to resources by not giving access to that person. The improvements which can be made are multiple network monitoring, connection state tracking, predicting source address, improving the infrastructure of the firewalls being used which enhances better security and doesn't allow any malpractices to happen.

[11]Many international terrorists gain knowledge about how to hack and gain illegal information and use it against the computers in the US especially. There are many ways of attack suck as physical attack, electronic attack and computer network attack. They lay a critical plan on how to get their tasks done and work as a team to get work done easier and in a better way. These professionals also create a link between hackers and terrorists where they partner together and get things done at an even larger scale.

[12]Attribution is defined as identity of an attacker's intermediary.in normal words it is know as "source tracking" instead we call it as "attribution", and in commercial world it is distributed denial of service(DDoS)attacks. It means intermediates but not only attackers. A resulting identity may be a persons name, an account, or simply information about the person who is operating the hacking things

Findings

We found that hacking has been used for both ethical and unethical practices and the good about it is that there is awareness also being spread to change the world of cyber networking and the bad is that they try to gain unwanted access to information of others which puts them in huge loss and may also lead to closure of the organisation.[13] "Searching becomes complex depending on large volume of data that are usually in the form of unstructured data, searching similarity over large volume of data with less response time and retrieval accuracy".

Conclusion

There can be better and stronger usage of coding and backup used when various softwares are launched and continuous check on the exchange of information in each and every part of the world. Also the punishments for such illegal practices should be made more stringent, thus expecting a reduction in such problems thereafter.

References

Anderson, R. S. (2009). *Cyber security and resilient systems*(No. INL/CON-09-16096). Idaho National Laboratory (INL).

Anderson, R. S. (2009). *Cyber security and resilient systems*(No. INL/CON-09-16096). Idaho National Laboratory (INL).

Conklin, A. (2006, January). Cyber defense competitions and information security education: An active learning solution for a capstone course. In *System Sciences, 2006. HICSS'06. Proceedings of the 39th Annual Hawaii International Conference on* (Vol. 9, pp. 220b-220b). IEEE.

Furnell, S. M., & Warren, M. J. (1999). Computer hacking and cyber terrorism: The real threats in the new millennium?. *Computers & Security*, *18*(1), 28-34.

Jain, N., & Jain, K. (2011). Cyber Crime: Prevention, Detection and Prosecution. In *First International Conference of the South Asian Society of Criminology and Victimology (SASCV), 15-17 January 2011, Jaipur, Rajasthan, India: SASCV 2011 Conference Proceedings* (p. 116). K. Jaishankar.

Schuba, C. L., Krsul, I. V., Kuhn, M. G., Spafford, E. H., Sundaram, A., & Zamboni, D. (1997, May). Analysis of a denial of service attack on TCP. In *Security and Privacy, 1997. Proceedings., 1997 IEEE Symposium on* (pp. 208-223). IEEE.

ShanmugaSundari, P., Subaji, M., & Karthikeyan, J. (2017). A survey on effective similarity search models and techniques for big data processing in healthcare system. *Research Journal of Pharmacy and Technology, 10*(8), 2677-2684.

Stohl, M. (2006). Cyber terrorism: a clear and present danger, the sum of all fears, breaking point or patriot games?. *Crime, law and social change*, *46*(4-5), 223-238.

Sukhai, N. B. (2004, October). Hacking and cybercrime. In *Proceedings of the 1st annual conference on Information security curriculum development* (pp. 128-132). ACM.

Uma, M., & Padmavathi, G. (2013). A Survey on Various Cyber Attacks and their Classification. *IJ Network Security*, *15*(5), 390-396.

Wang, E. K., Ye, Y., Xu, X., Yiu, S. M., Hui, L. C. K., & Chow, K. P. (2010, December). Security issues and challenges for cyber physical system. In *Green Computing and Communications (GreenCom), 2010 IEEE/ACM Int'l Conference on & Int'l Conference on Cyber, Physical and Social Computing (CPSCom)* (pp. 733-738). IEEE.

Wheeler, D. A., & Larsen, G. N. (2003). Techniques for cyber attack attribution (No. IDA-P-3792). INSTITUTE FOR DEFENSE ANALYSES ALEXANDRIA VA.

Wilson, C. (2003). Computer attack and cyberterrorism: Vulnerabilities and policy issues for congress. *Focus on Terrorism*, *9*, 1-42.

WHY AND HOW ARTIFICIAL INTELLIGENCE IS THE NEW BLACK

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Introduction

Today, we live in a society which has aggravated problems thus posing the need for modern and intelligent solutions. Intelligent solutions further need genius and capable minds and hence artificial intelligence was birthed. Even though AI was discovered a long time ago, it wasn't until the recent times that serious and advanced research on AI was in work. The aim of AI is to replicate human minds to solve real world problems. The different domains of AI are discussed in detail in the following sections.

What is AI?

[1] Artificial intelligence is the learning of human minds with the help of simulations run by the computer.The mention of the word "Intelligence" in the term Artificial Intelligence is deceptive. Usually, this word is used to refer to demonstration of any extraordinary accomplishments requiring rare cognition. Consequently, it follows that "artificial intelligence" is a technique for replicating a treasure of clever insights using computational models built using relevant data of past experiences. However, the challenge for AI comes from the computed efforts to replicate the mental faculties of "ordinary" people, such as vision and natural language. The basic premise of AI is the following:

The brain is assumed to also use similar computation based on past experiences to arrive at insights and decisions.AI is usually put into use to replicate the general attitude that goes along with intelligence, while it does not assure a specific way of fabricating the outcome as the AI methods may not be closely what humans follow). [2] Artificial Intelligence (AI) is a broad term that indicates use of a computational model to simulate intelligent behaviour with negligible human intervention.

AI is considered a culmination of both science and engineering to build intelligent machines. This idea was envisaged as early as 1956. The concept is applied in a broad range of fields including Health industry in the form of robotic surgeries, aid medical diagnosis, medical statistics etc.

History of AI

[3] AI began as make-believe invention, science fiction and promise. Those who authored Science fiction utilised their imagination of smart machines to develop the fantasy of intelligent inanimate objects serving their fantasies based on our own human features and properties. Although their imagination was limited and were to serve the curiosity of their audience.The early invented AI skill was Chess which was broadly used as a measure for studying interpretation mechanisms in the early years of AI research. During twentieth century innovations in electronics and after World War II advent of modern computers at Harvard, Bell Laboratories the IBM showed possibilities of fictious demonstrations. This resulted in tremendous computing power. During the latter half of the century, computational devices and computer languages powerful enough to develop tests of concepts came up. Artificial Intelligence does not only mean robots. But it is very much about being empathetic about nature of intelligence and feat using computers as experimental machines.[4] Leonardo Da

Vinci drafted designs for a robot in the form of a primitive cavalier in the year 1495. It is not known if his contemporaries tried to replicate his design. His design was expected to be able to move its limbs, sit, stand and open its mouth wide open.In the book Leviathan, Thomas Hobbes wrote that it is possible to build an artificial animal.

Growth of AI

[5] Artificial Intelligence is engineering science comprising of a set of computation technologies that are motivated by operating out of the box from the usual patterns people use their cognitive skills and senses to understand, apply reason and act. While the rate of advancements in AI has been irregular, there have been noteworthy developments since the field's commencement several years ago. This was once mostly an academic research topic; the ongoing century AI empowers mainstream technologies that are having impressive impact on our lives every day. Futuristic vision and AI planning drive the video games are now a profit-making entertainment industry than the mostly popular Hollywood. Deep learning is a form of ML that is based on layered representations of different possibilities also known as neural networks. It has made understanding voice commands possible on devices, and Deep Learning can be applied in various ways of applications that count on pattern recognition. Natural Language Processing (NLP) has powered machines to carry out effective web searches.[6] Artificial intelligence (AI) has been progressing swiftly in last few years. It is measured in context of resources devoted to it and the quality of different outputs.

Recent indication suggests that AI is having a big impact on the economy. A variety of statistics show robotics shipments, AI start-ups, and rising number of patents. A review of recent research shows that AI and robotics have the possibility to increase productivity and may have combined effects on labour. These rapid progressions apply not to the field of AI, but to all the connections including and not limited to robotics, sensors via digitization (known as "Industry 4.0"). These improvements have started to appear themselves in a variety of applications, including AI conquering humans at complex strategy games.

AI in Healthcare Appliances

[7] Pressure, is force divided cross-sectional area over which it exerts. Inside the human body, regular physiological activities build various pressures, suchblood pressure *etc.*, all of which are vital health measures. Pressure sensors can produce signals and function in a manner. AI can hence help in the successful execution of this product.Artificial intelligence is human-like intelligence displayed by machines and algorithms is an important research area for sensors. As technology is progressing, remarkable development has been observed in this field with impressive advantages like its pliability and economic cost.Another outstanding invention is organic pressure sensors whose sensing capabilities transcend that of human skin which is the most widespread organ of the body. This has been a huge breakthrough in the development of electronic skin, popularly known as e-skin. [8] Internet of Things, popularly known as IoT, is a part of AI and is an essential key to building smart homes. Recent innovation of IoT in healthcare is the observation of a baby's actions through intelligent multimodal system which makes use of control charts.RaspberryPi is the technology used to create these control charts. A control chart is created in real time and linked to vision sensors. The baby's behaviour is monitored through indications on the chart. If the value is above a certain value or below a certain value, it implies abnormal baby behaviour. This data is transferred to special IoT devices in smart healthcare centres, specifically to the person incharge of taking care of the baby, so as to give the necessary treatment and attention. This model has been a

huge success in observing baby(ies) using advanced technology. [9] Orthognathic surgery is a surgery performed to correct jaw or lower face conditions.Prognosis and treatment methodology is crucial for a triumphant surgery and good recovery. Hence, accuracy is very important. Since AI had already been used to tackle different problems in the medical fieldwhich also turned out to be successful, it was decided to innovate models based on AIthat can be used to decide the mode of treatment for orthognathic surgeries. 316 patients were studied under this framework. The model prescribed invasive mode of treatment for 160 patients and a non-invasive approach for156 patients.It worked with 2 neural layers and 1 hidden layer. There were 3 different stages to decide which approach was the best and based on these stages, 4 models seemed to perform exceptionally well. These models had an accuracy rate of 96% in terms of deciding treatment plan and 91% accuracy in terms of detailed explanation and final outcome. This suggests that AI can be used to study orthognathic patient and can also be used to devise the optimum treatment plan.

AI in Manufacturing and Production

[10] Based on research into the applications of artificial intelligence (AI) technology in the manufacturing industry in recent years, we analyze the rapid development of core technologies in the new era of 'Internet plus AI', which is triggering a great change in the models, means, and ecosystems of the manufacturing industry, as well as in the development of AI. We then propose new models, means, and forms of intelligent manufacturing, intelligent manufacturing system architecture, and intelligent manufacturing technology system, based on the integration of AI technology with information communications, manufacturing, and related product technology. Moreover, from the perspectives of intelligent manufacturing application technology, industry, and application demonstration, the current development in intelligent manufacturing is discussed. Finally, suggestions for the application of AI in intelligent manufacturing in China are presented.[11] Manufacturing is awaiting a great challenge - the challenge of Artificial Intelligence (AI). We are witnessing the proliferation of applications of AI in industry, ranging from finance and marketing to design and manufacturing processes. The AI tools have been incorporated into computer-aided design software, shop-floor operations software, as well as in entering the logistics systems. The success of AI in manufacturing can be measured by their growing number of applications, releases of new software products, companies developing and distributing these products, conferences and new publications. [12] Series of constant production is intelligent production. They are classified into 3 categories: digital manufacturing, digital-networked manufacturing, and new-generation intelligent manufacturing. New-generation intelligent manufacturing corresponds to incorporating AI into production and manufacturing technology. This helps in driving the production and manufacturing value to heights and increased outputs beneficial to all.

AI in Security and Surveillance

[13] AI has seen tremendous growth in the world. Different sectors of every country are trying to come up with strategic plans to implement AI to increase their security. Businesses use artificial intelligence to improve systematic transformation; city officials are using AI to control the traffic situation. This technology is proliferating at a fast speed. At least 75 out of 176 countries are using it for monitoring and inspection for example, facial recognition systems, smart and safe city, policing. One such country which has put AI to a very intelligent and beneficial use is China. Chinese companies—particularly Huawei, Hikvision, Dahua, and ZTE— are supplying AI surveillance technology in 63 nations. Huawei is in charge of supplying AIS technology to at least 50 countries

in the world. Other companies based in—France, Germany, Israel, Japan—are also playing a significant role in growing this technology to the nations use.[14] AI has gained a lot of attention on the international front. Most of the developed countries are trying to understand AI better and are trying to implement it to increase their security. One such example is China. China's officials believe in mastering and conquering AI technology to protect their citizens and country. Their community policies focus on the AI strategies of other countries like the United States of America. One of their assigned communities dissect everything that is to be known from the reports of AI strategies used by USA. [15] AI surveillance is used to track the growth of COVID 19 cases, prognosis of the cases and trace its reach. This is done by collecting information from all citizens irrespective of their health status. There are many foundations that can support and help health care officials. These foundations are not exactly invented to suite the pandemic scenario, they can be used to answer any worries related to rights, privacy etc.

AI in Education

[16] In the age of modern technology, AI has impacted the working of a nation including the education sector. It has influenced the teaching methodologies in massive ways. The footprint left by AI on education can be explored in 2 sections – First, what is supposed to be taught to students in AI and second, how it can remould education. Let us tackle the first question. Modern education must focus on developing the following qualities in students in order to make the most out of life and the resources provided –

1. Ambidexterity to be confident and tackle challenges with an optimistic attitude.
2. Applicability which serves as an incentive.

These qualities can be embedded in the students by emphasising on present day skills, judicious attention on traditional skills and practice of concepts learnt in the classroom in real life problems.

Moving on to the second question, education can be remoulded by using EdTech and AIED (artificial intelligence in education). Of course, these should be implemented in a phased manner in order to expect maximum output. Companies like Google, Amazon and Facebook have invested millions in AIED to create technologies that focus on empowering students to get hold of their learning therefore making this interactive mode of teaching more fun and engaging, in a way that students have a broader perspective on gaining knowledge, in the right way.[17] AIED has undergone a lot of transformation over the past few years in order to develop the perfect teaching methodology for students that brings out the best in them. The main objective of AIED is to innovate new ways to replace the old school face to face teaching and to our benefit, there has been progress towards this target. ILE (interactive learning environment) has shown that AIED has been successful in increasing productivity of the students by modifying the traditional old school methods of learning. It also aims to evoke qualities of metalinguistic, reflective and logical reasoning among the students. There have been several papers written for a long time now, addressing the system evaluation, modelling approach, short comings and the potential problems that we might face and solutions to tackle these problems. Some of the essential things to keep in mind while developing a strategy are – type of assignments given to students, whether they work in groups or individually, schooling target, type of technology used and academic environment.

1. The type of assignments given to students can be stepwise problems that require application ofonly one skill for several problems and intricate problems which require application of several skills.

2. Independent students can use their own computers or a group of students can use one computer ormany students can use different computers and technology and work together to solve a problemwhich will help them not only in contributing individually to the solution but also to learn from one another hence broadening their perspective.

3. Educational realms that incorporate joint learning strategy have significantly shown to improve learning experiences of students.

4. Schools need not be coerced into switching entirely to a computer-based learning in order to implement AIED. We can broaden our perspective to include other technologies and gadgets like mobile phones, tabs and other inventions in the field of robotics. These new technologies will help revolutionize the education sector.

5. Learning goals should shift from the final product to the necessary actions that need to be taken. This includes self-supervision, joint learning strategy and inspiration.

STEM education is rising in popularity as many schools have started adopting it. STEM stands for Science, Technology, Engineering and Mathematics. It helps students to develop higher thinking to solve real life problems in a sophisticated manner.

Hence, AIED adopts a comprehensive view on education in the modern world.

[18] AI is a revolutionizing technology that aims to replicate the human mind and its responses to solve real world problems. It is taking over the entire world by a storm, by replacing old school methodologies by new mind-blowing innovations that specializes in abstractive thinking, complex idea comprehension, flexibility, versatility and analysing real world problems. And its application in revolutionizing the educational realm is no exception. Artificial intelligence has been adapted by the world of academia in many ways like switching to online mode of teaching with the help of ground breaking technology, utilizing robots for teaching with the help of real-world teachers. This has significantly helped the teachers to upgrade their quality of instruction, to monitor and give one on one focus to students and help them tap their higher potential, and also to evaluate tasks accurately and intelligently. Not only does it benefit the teachers, it also gives the students an upper hand in personalizing their curriculum, hence improving their learning experience and also boosting their confidence, motivation them to reach heights. [19] The success of AIED in the near future is dependent on three factors.

1. The transition from old school, black board teaching to joint learning strategy needs the use of different learning models which are ahead of the typical statistical models. These models need not be analytical or logical.

2. The existing syllabus needs to be updated while keeping a broad perspective and include topics of modern education. The teachers also need to be trained accordingly to make the best out of this new system of teaching. Smart classrooms need to be established and one on one teaching needs to be emphasised in a smart manner.

3. Mock-ups can be used to strategically plan the approach and limiting the resources that the students can use. It can give clarity on the schemes that it supports and does not support, help in application of theory and also come up with new resources for the students to work with. For example, the ITS program incorporates all the above-mentioned points which has made its transition and implementation very easy and effective.

[20] Robotics is a sector that is very fast growing in terms of innovations and applications for its wide range of utility. The application of robotics in the education sector has been proven to be very effective and educational. One such application is educational cobots which is an assistant that

assists teachers. Sometimes students can struggle with concentration and teachers may tend to give less attention to those who are slow paced and have a hard time in grasping concepts. In such cases, cobots come into play to help students concentrate and aid the teachers in distinguish between students who have different learning speeds so as to provide equal and fair learning opportunities to all. Students can take part in ILEs (Intelligent Learning Environment) and be engaged in all the activities.

Advantages of AI

[21]One of the strongest characteristics of AI is that it is designed to think like a human. Which means it can perform tasks that humans can do. But the best part is that emotions will not be involved during decision making which makes it easier to take tough decisions. It is purely based on the truth and reality. We often face this issue of not being able to take the necessary steps or decisions because our emotions cloud our judgement which leads to bad choices. With AI, this is no longer a problem, thus resulting in accurate decisions for the best. As humans, there is a limit as to how much we can work and sometimes this can be a disadvantage. But AI based gadgets do not require any resting time which s huge asset especially when crucial work needs to be done last minute. Passing on the information from one person to another can also be very tedious and time consuming but this is not at all a problem if AI based gadgets are used. They can be copied and transferred to as many devices as required thus being time efficient. [22] Artificial intelligence offers dependability and constancy while being economical. Because of its wide range of applicability, it has been used to restructure different fields such as healthcare, engineering, manufacturing and production, education, economics and legislation. It has been meticulously used in search engines to categorize, search content, webpages, videos and other relevant content. The data stored in it is never lost, in case the organization loses employees due to various reasons, which makes it reliable. Problem solving is also faster and time efficient depending upon the intricacy of the problem. Another useful application of AI is that it can be used to replace traffic polices. These traffic robots can monitor the traffic situation, study it and foretell the traffic conditions. They can report accidents too, if any. AI has been used to increase security as well. It can identify where security laws are violated, formulate new and creative security laws. [23]AI can be applied to psychiatry as well. Some of the profitable and prosperous projects that have been executed are –

1. PARRY is a prototype explaining delusional behaviour in psychiatric patients. It was founded by K. L. Colby.
2. EMYCIN is a set up that administrates psychiatric illnesses. It was founded by B. Mulsant.

Some of the advantages of applying AI to psychiatry are –Patients feel more comfortable in sharing their medical history, symptoms and their private information to a computer than a human; It is cost efficient compared to the traditional face to face psychiatric therapy; Increased productivity with minimum to no flaws is also observed.[24]One of the advantages of AI which is lesser known and talked about is its application in suicide care. Unfortunately, rate of death from suicide is growing every year causing 8 lakh deaths every year. What makes it difficult to prevent suicide is that it is highly unpredictable as there no single specific cause. This is the driving force behind the innovation of programs, which are based on artificial intelligence, to prevent suicides. The systems are designed in a such a way that after entering the relevant data, it will study that past suicide outcomes, create a pattern and be able to discover the major threat factors, recognize individuals or a group of individuals who are suicidal or at high risk and design a proper and effective care system for those individuals. A system was designed by scientists from Vanderbilt University to predict

whether an individual is suicidal or not using data from the patient's health records. This system displayed a precision of 84-92% in 7 days and 80-82% in a year therefore making it accurate and reliable.

Due to the high success rate of these models, it can be implemented on a large scale and expand its reach to individuals who are in critical need of help and care. It is not only accurate, but also time and cost efficient, better than face to face psychiatric therapy sessions and can be set up in various locations. [25]Applications of AI in healthcare is another advantage as it is helping huge masses.

Setting up a consultation, reminders for the re-examinations, warning signs against drug medication, booster dose reminders for all individuals, doctor's appointment for pregnant women is made easy through just a few clicks. It is used to record and store the patient's medical history, prognosis, diagnosis etc and also help in deciding the optimum treatment plan. Robots, which are AI based humanoids, are also being used to assist surgeons in surgeries and aid the senior citizen. Many intelligent devices like prosthetic control systems have been developed to aid disabled individuals.

The field of medicine that is most accepting of AI and its applications is radiology. Through this wonderful invention, imaging will be accurate and radiologists will be able to analyse them efficiently. AI is also used to monitor health and immediately notify the concerned authorities if there are any changes in the patient's condition. [26] Due to the increasing population, the demand for food resources is also increasing. Increasing demand also means increasing prices. Without food resources, it becomes a game of survival of the fittest, and in this case survival of the wealthiest as they can easily afford it. This huge social inequality which could lead to global hunger is therefore a global problem that need immediate attention. It is impossible to meet the current food requirements without the intervention of modern approaches. The field of artificial intelligence, once again, shines as it can be implemented to solve this crisis. AI can be used in crop selection to help the labourers in picking a fertilizer. Information about crops and their preferred fertilizers for optimum yield are entered into the data warehouse which can be accessed later. This process of entering relevant data into the machine and equip it to make decisions when presented with problems is known as deep learning. It is thorough and extensive. Internet of Things (IoT) is the basis of Smart Agriculture. AN example of one such application is watering networks which uses soil, moisture, IR, water sensors and a motor to perceive environmental data and use that to pump water to the crops when it is necessary. This way we control irrigation and conserve water. Soon robots can also help in agricultural tasks such as weeding, spraying etc. This is not only time efficient compared to manual work, but will also decrease labour which is a huge plus point considering the fact that agriculture is a labour-intensive occupation. Hence artificial intelligence in agriculture has a lot of benefits.

Challenges or Dis-advantages of AI

[27] It is true that AI, being able to replicate the human mind and its responses, has revolutionized many areas, but it is not always advantageous. It lacks in many departments like creativity, common sense, logic and reasoning. It lacks true understanding of the world and human emotion which is very essential in some cases. Most of the decisions made by AI cannot be explained as it fails to give us a fair reasoning. As it lacks common sense, it may also not be able to identify when a problem does not have a fixed solution. If there is flaw, AI can produce incorrect answers and we will never know if it is right or wrong as it does not provide any explanation.

[28]Some of the disadvantages of AI are mentioned below:

1. If it falls into the wrong hands, it can be very dangerous.

2. AI is so powerful with a lot of capabilities that it can soon replace people and hence increases the problem of unemployment.
3. Excessive use of AI gadgets can make us very lazy as we might become heavily dependent on them.
4. To create gadgets and technology which are AI driven is too expensive and time consuming.

[29]Advancements in the field of technology has birthed artificial intelligence, a technology which has reformed several domains. It is being thoroughly studies and researched in developed countries like the United States, in Europe and developing countries like China and India. Recently, new technologies have been developed under artificial intelligence – Information communication technology (ICT) and Robot technology (RT). Though proven to be quite impressive, it has some drawbacks.

1. Prototypes based on ICT are elaborate, heavily reliant on user data and is deficit in creativity.
2. They can affect jobs of individuals.
3. As most of the tasks are made easy by ICT, their users might adopt a lethargic lifestyle.
4. Lesser social interactions.
5. Initial cost of setting up is expensive. Repair and maintenance of RT is also quite extravagant.
6. As humans are evolving, problems are evolving too. This calls for an update of programs to keep up with the changing scenarios.
7. RT models are constrained to programming entered by users thus they lack in creativity.

[30] Artificial intelligence in medicine has made tremendous progressive which is quite impressive. From surgery, radiology, oncology to administration, AI has conquered each one of these domains to make much needed and productive advancements. However, AI in medicine has its shortcomings which are equally hazardous. Some of them are –

1. The use of AI can bring up some legitimate disagreements. The 'Black-Box' algorithm causes medical negligence and product liability as the machine driven by AI given no explanation or reasoning on how it reached the final answer.
2. AI-developed face recognition technology can be at a disadvantage here as patient's image can be put at stake due to the lack of rules and regulations protecting sensitive and personal data. [31]One of the lesser talked about disadvantage of AI is no presence of human touch. For example, when we see a personality on the television, most of us can recognize them elsewhere even if we have seen them for one fleeting moment. But the same is not true if the situation was reversed. So, if we were to instruct AI to recognize who-is-who in huge masses, it is very time consuming and exhausting. So, what advantage do we have over AI machines? Humans are capable of registering information in a single shot whereas AIs are bound to deep learning only. We work in a compliant manner which is very much needed but deficient in AI proving that natural intelligence of the human brain is essential. [32] Some of the disadvantages of AI in education are -
   • Robots are emotionless which can prove to be quite unfavourable to both teachers and students and hence unwelcome. Students might lack the basic human emotions that they need to express and may feel detached from the human world.
   • Teachers can be replaced easily therefore increase the chances of unemployment which.
   • Robots cannot keep track of each student's academic records personally and parents will be unhappy as there is no two-way communication.

- Robots are not personalized nor personally invested in seeing the children's success and cannot provide what the child truly needs. Whether be it giving extra attention to a slow achiever or making sure to give extra push to average students or making sure that high achievers are utilizing their talents and opportunities perfectly, nothing can beat a human teacher.

Conclusion

In my opinion, AI is an advanced and futuristic technology which has the capacity to take over the world and change many lives for the better only if used for the right causes. Today, we live in a society which has aggravated problems thus posing the need for modern and intelligent solutions and I believe that AI is the answer that we are all looking for. Be it simple day to day tasks such as driving to work, turning on the heater, cleaning, listening to music, or, complex and heavy matters which need to be dealt with intricately such as healthcare solutions, national security, education etc, AI steps in to save the day. But it is not always rainbows and butterflies! Just like any other technology out there, it is no exception that AI has its disadvantages. But these can be carefully dealt with provided we have the right knowledge and motive. Thus, I conclude my thesis by saying that AI is definitely a positive influence in our world which should be accepted openly. It can open new doors and opportunities for us to upgrade ourselves into high thinking and high living individuals. Hence, Artificial Intelligence is the new black.

References

Allen, G. C. (2019). *Understanding China's AI strategy: Clues to Chinese strategic thinking on artificial intelligence and national security*. Washington, DC: Center for a New American Security.

Amisha, P. M., Pathania, M., & Rathaur, V. K. (2019). Overview of artificial intelligence in medicine. *Journal of family medicine and primary care*, *8*(7), 2328.

Baker, M. J. (2000). The roles of models in Artificial Intelligence and Education research: a prospective view. *Journal of Artificial Intelligence and Education*, *11*, 122-143.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Charniak, E. (1985). *Introduction to artificial intelligence*. Pearson Education India.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

Choi, H. I., Jung, S. K., Baek, S. H., Lim, W. H., Ahn, S. J., Yang, I. H., & Kim, T. W. (2019). Artificial intelligent model with neural network machine learning for the diagnosis of orthognathic surgery. *Journal of Craniofacial Surgery*, *30*(7), 1986-1989.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Feldstein, S. (2019). *The global expansion of AI surveillance* (Vol. 17). Washington, DC: Carnegie Endowment for International Peace.

Fonseka, T. M., Bhat, V., & Kennedy, S. H. (2019). The utility of artificial intelligence in suicide risk prediction and the management of suicidal behaviors. *Australian & New Zealand Journal of Psychiatry*, *53*(10), 954-964.

Furman, J., & Seamans, R. (2019). AI and the Economy. *Innovation policy and the economy*, *19*(1), 161-191.

Hamet, P., & Tremblay, J. (2017). Artificial intelligence in medicine. *Metabolism*, *69*, S36-S40.

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education. *Boston: Center for Curriculum Redesign*.

Hussain, T., Muhammad, K., Khan, S., Ullah, A., Lee, M. Y., & Baik, S. W. (2019). Intelligent baby behavior monitoring using embedded vision in IoT for smart healthcare centers. *Journal of Artificial Intelligence and Systems*, *1*(1), 110-124.

Jha, K., Doshi, A., Patel, P., & Shah, M. (2019). A comprehensive review on automation in agriculture using artificial intelligence. *Artificial Intelligence in Agriculture*, *2*, 1-12.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Kusiak, A. (1990). Intelligent Manufacturing. *System, Prentice-Hall, Englewood Cliffs, NJ*.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

Lu, H., Li, Y., Chen, M., Kim, H., & Serikawa, S. (2018). Brain intelligence: go beyond artificial intelligence. *Mobile Networks and Applications*, *23*(2), 368-375.

Nilsson, N. J. (2009). *The quest for artificial intelligence*. Cambridge University Press.

Rigby, M. J. (2019). Ethical dimensions of using artificial intelligence in health care. *AMA Journal of Ethics*, *21*(2), 121-124.

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education*, *26*(2), 582-599.

Servan-Schreiber, D. (1986). Artificial intelligence and psychiatry. *Journal of nervous and mental disease*.

Shachar, C., Gerke, S., & Adashi, E. Y. (2020). AI surveillance during pandemics: ethical implementation imperatives. *Hastings Center Report*, *50*(3), 18-21.

Stone, P., Brooks, R., Brynjolfsson, E., Calo, R., Etzioni, O., Hager, G., ... & Teller, A. (2016). Artificial intelligence and life in 2030: the one hundred year study on artificial intelligence.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Tao, B., Díaz, V., & Guerra, Y. (2019). Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher. *Arctic Journal*, *72*(12), 30-50.

Teng, X. (2019, April). Discussion about artificial intelligence's advantages and disadvantages compete with natural intelligence. In *Journal of Physics: Conference Series* (Vol. 1187, No. 3, p. 032083). IOP Publishing.

Timms, M. J. (2016). Letting artificial intelligence in education out of the box: educational cobots and smart classrooms. *International Journal of Artificial Intelligence in Education*, *26*(2), 701-712.

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. *Materials Horizons*, *2*(2), 140-156.

Zhou, J., Li, P., Zhou, Y., Wang, B., Zang, J., & Meng, L. (2018). Toward new-generation intelligent manufacturing. *Engineering*, *4*(1), 11-20.

IMPROVEMENT IN DESIGN OF ENGINES TO REDUCE EMISSIONS IN AIRCARFT AND INCREASE FUEL EFFICIENCY

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Abstract
The aviation industry in today's world is growing constantly and it is at its peak. This increases the demand for fuel and also results in more pollution by the emission of gases like CO2 and NO2. The scientist and engineers are working to increase fuel efficiency of aircraft engines thereby reducing the emissions of the greenhouse gases responsible for ozone layer depletion.
In this paper there is an investigation about different challenges to increase the fuel efficiency in aircraft engines. It also highlights about different alternative fuels for increasing fuel efficiency thereby keeping in mind pollution norms.
Keywords: *electric propulsion, bio fuel, greenhouse gases, fuel cell, future aircraft*

Introduction

The efficiency of an engine i.e. a thermal engine is the relation of the total energy stored in a carrier (fuel) with the amount of energy required to execute useful work. A fuel-efficient engine is which makes the maximum use of the fuel provided to perform work. In theory, the maximum efficiency that could be achieved by a combustion engine (according to Carnot) is limited to 64%. However, in real life, this efficiency is reduced to a maximum of 50% where this 50% efficiency is achieved by formula race cars for example, Mercedes' Formula 1 engine recently broke the 50% thermal efficiency barrier for the first time. The petrol engines we are sing are having an average efficiency of 30% max in ideal conditions and the diesel engines which we use have an efficiency of 30% roughly and could be achieved to 41% in ideal conditions. Most of the energy is wasted in air drag, friction and heat radiation.

The world is facing a petroleum crisis and thus demands an engine which is both fuel and cost efficient and could also be used in our day to day commuting. One kilogram of fuel consumes fifteen kilograms of air to burn and produce about three kilograms of Carbon Dioxide, significant amount of energy is also required to pump the fuel in and out of the engine. This carbon dioxide produced contributes to the world annual production of 31 billion tons of Carbon Dioxide. This CO2 is a major greenhouse gas which results in major climatic changes. Thus, one additional goal of the modern day engineers is to make engines that also minimize pollutant emission and allow the usage of different fuels in transportation systems.

The problem faced today in that even if a new engine is made, it should be able to run on the current fuels available or if a new fuel is synthesized it should be compatible with the current engines. The acceptance by the consumer is also important. The current development in the automobile industries like down sized engines and the use of increased pressure in fuel injection must work with the existing fuels.

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This study is intended to fine a possible solution for increasing the efficiency of aircraft engines or finding cost effective fuels or fuel replacements. The development of these engines is not centered only to the daily use aircraft like airbusA380 and jumbo jets but also to the heavy fighter aircrafts used in the international security.

Literary Survey

[1]-The research shows that at the present time, a "drop in" jet fuel replacement, i.e. a proper mixture of kerosene and synthetic fuel, in a proper composition would be a viable substitute in the aircrafts of now and near future. Synthetic jet fuels manufactured using Fischer-Tropsch process are very alike to standard jet fuels but contain almost zero sulphur and aromatics, which results in lower particulate emissions. Since, synthetic fuels have already been in use for sometimes at Johannesburg airport, it would be easy to adjunct the jet fuels of today with synthetically derived fuels. On the other hand, a combination of synthetic and bio- fuels is also a possible midterm solution. On using pure bio-fuels we face major challenges like their proclivity to solidify at standard cruising conditions, inferior high temperature thermal constancy etc. Therefore, these issues need to be addressed to make their future use possible. In spite of these problems the advantages of using bio-fuels are their environmentally balanced CO_2 impact and their potential to become a sustainable fuel. Solutions that would be successful for a longer period need to effectively minimize the release of greenhouse gases, hence, need alternate fuels with almost negligible carbon content, the examples of these are liquid Hydrogen and Methane. The drawback of using these cryogenic fuels is that major modifications are needed in the combustor and fuel system components of the aircraft. Moreover, a heat exchanger would be required for vaporizing the fuel before combustion and hence, compromises must be made with the airframe design. The hefty insulated fuel tank would decrease the aircraft's energy efficiency in short- ranged flights. [2]-This research shows the advances of the modern world towards the "More Electric Aircrafts" (MEA), giving more focus on the flight controls. The aircrafts of today are a mixture of electrical, mechanical, pneumatic and hydraulic systems which are the products of decades of evolution. In the standard architecture of aircrafts, engines convert fuel into power, maximum part of which is utilized for propulsion and the remaining for the other components. With the passing decades each system has become more composite reducing the efficiency of the aircraft by their interactions. An all-electric aircraft is one in which every form of power consumption is electrical in nature. It is believed that an all-electric system has more potential in future aircraft use than the conventional aircrafts, both in terms of efficiency and environmental impact. There are various steps taken towards MEA, first being, the removal of present hydraulic and air engines and increasing its capability of generating electrical power. This needs lots of changes in fault protection techniques, network techniques and generation of electricity. The second being the substitution of hydraulic mechanism for electromechanical mechanism, reduction in weight and reducing production and maintenance expenditure, MEA lays stress on the usage of electrical energy to advance the performance and life of the aircrafts. [3]-The present-day range of aircrafts which are jet powered face a very important challenge, which is the reduction of CO_2 and CO and NO_2 emissions while as increasing the efficiency of aircraft. Since the emission of unburned hydrocarbon and carbon monoxide (CO) are thus far very low and these pollutants are continuously controlled as expected when engine pressure and temperature ratios are elevated, it is very important to change the engine design which will help to reduce the NO_2 emission which in turn will increase the fuel efficiency. One way to reduce fuel efficiency and reduce NO_2 is that we can use the concept of staged combustion, splitting the loading of fuel among the several fuel and air phases which controls the localized fuel to air ratio to reduce the NO_2

production rate as the power is elevated. The pilot section should be at a position which is near the centreline of the engine and the main section should be outboard and should be towards the downstream of the pilot section. The benefit of using this type of system is that it eradicates the combustor receptiveness to blow out. [4]-Fuel-cooled thermal management consists of breaking of large hydrocarbon molecules into simpler and smaller alkenes, this process is endothermic and improvement of hydrocarbon fuels. It is a way for cycle improvements and pollution emission control in gas turbine engine applications. This technology is based upon the standard multi-component hydrocarbon fuel for improvement in fuel cooled thermal management. It involves the improvement of endothermic potential of JP-7 and JP-8+100. It is demonstrated with the help of bunch scale test rig working under flow conditions and passage geometers mimetic of practical heat exchangers for aircraft and missile technology applications. Full scale sector rig tests are performed in order to define the combustion and emission of supercritical jet fuel. It is also used to ensure safety and working of the fuel systems, including a fuel air heat exchanger. [5]-Fuel efficiency of a turbofan engines can greatly be increased by decreasing its weight and size and also by decreasing the engines specific fuel consumption. By reducing the weight of the engine, it results in decreasing aircraft maximum take of weight which can further reduce aircraft lift to drag ratio. By bringing down the engine size mainly, the nascle radius and length of the engine results in lesser thrust requirement of the engine specific fuel consumption can decrease the fuel consumption. We can reduce engine specific fuel consumption by increasing the ability to push forward or we can say it propulsion and thermal efficiency. By using the modern computational fluid dynamics abet 3D-blade designs, it is already quite aggressive and therefore we can take a limited advantage in fuel efficiency. By improving component efficiencies and reducing other losses like duct pressure losses and the cooling flows losses, it is also a way to improve the specific fuel consumption. [6]-This research shows NASA's response to the increasing demand and care about the environment. Subsonic fixed wing project of NASA recognizes four problems which are exhibited in air travel. These problems include emissions, noise and fuel burn of aircraft and span area in design of aircraft. NASA has been exploring one of the propulsions and vehicle concepts for year 2020 that is a synergistic combustion of a distributed propulsion system and a hybrid-wing-body airframe. NASA has already taken some steps like in 2006 NASA financed a one-year research or study which was focused on benefits of distributed propulsion, body or airframe design to increase efficiency and done some operation on aircrafts from some local airports. To develop a silent aircraft, MIT Institute in Cambridge have developed a conceptual design known as SAX-40 which was further worked on by NASA and Boeing. [7]- The design and construction of an aircraft which would be powered by fuel cell and will be unmanned like drones. Many researchers and scientists have developed aircrafts which are powered by fuel cell to show possibilities of using fuel cells as new source of energy and power. For existing batteries as a replacement fuel cell system are combined generators using hydrogen. In past first fuel cell was developed by AeroVironment in 2005 which used hydrogen in liquified from. Aircrafts using fuel cell of current generation is classified on the basis of methods to store hydrogen and fuel cell types. For development of an aircraft using fuel cell, some of these things should be kept in mind. Fuel cell systems should be starting fast and recharge of fuel should be convenient. Fuel cell components should be more reliable and should have less weight. Test of performance of aircrafts using fuel cell should be done in harsh conditions and climatic conditions like rainy day etc. [8]-It is shown that consumption of aircraft fuel and cost of fuel is a major problem faced by aircraft industry since past years. Reduction in consumption of fuel ss important is as leads to reduction of emissions like greenhouse gases and pollutants that can cause damage to us. This paper discusses a method to model airplane terminal to reduce fuel consumption that will lead

to differences between fuel consumption which is modelled and one which is measured. One way by which fuel consumption could be minimized is by procedures such as continuous arrivals which are descent and tailored. In present era, available airplane performance models show that error in fuel consumption in terminal area is order of 20 to 40%. The method is based on using airplane manufacturers' existing airplane performance tools and for existing fuel consumption methods, it is not a modification. Nowadays, due to increasing fuel costs, aircraft stakeholders have developed some algorithms for modelling consumption of fuels. [9]-It is shown that the main motives in the design of aircrafts of future is to reduce nose made in airports, emissions in reduced level and less amount of fuel burn. Over last 50 years, aircraft industry got many changes due to increase in air traffic through various processes by use of technology due to which already levels of noise pollution and fuel consumption decreased but at a low level. Technology which have to be used in engines of aircraft are enhanced design in propulsion of system that which uses superconducting, electric generators that are cooled and drives low noise electric fans by use of motors. New propulsion systems lead to fuel efficiency. The bypass ratio (BPR) which is known as the ratio of rate of flow of stream that passes outside core divided by that flowing through the core, plays a crucial role in designing of engine. A BPR which is higher means exhaust with lower speed which reduces fuel consumption at the cost of an increase in fan diameter. Aero propulsions which are electric offers huge benefits in the design of aircraft, resulting in much more energy efficient engine. [10]-Air travel is one of the fastest growing modes of transportation. It is the most important mode to travel. Increase in the total fuel consumption and the potential impacts of aircraft engines emissions on the global atmosphere has led to thinking among the engineers, scientist and authorities. So, they have to search for the various emission options and to reduce fuel demand of engines. The technological and operational fuel efficiency of aircraft was first analysed by using Breguet range equation. By using the equation, the aviation system efficiency parameter was defined which determines its efficiency and load factor. Multivariable statistical analysis was used to determine and correlate this parameter with direct operating cost.

The fuel burn reduction potential for future aircraft system is to be estimated by this paper with the help of extrapolation of historical trend in aircraft technology and operations and the fuel burn reduction for future aircraft systems.

Findings

After reading all papers it is clear that bio fuels can be a replacement for the fossil fuels because of their balanced emissions of the CO_2 and other greenhouse gases. Further fuel efficiency could be achieved by modifying engine design, using electric propulsion etc. Fuel cooled thermal management systems is also a way for cycle improvements and pollution emission regulation in gas turbine engine application. Fuel efficiency of a turbofan engine can be greatly increased by decreasing weight, size and also decreasing engine specific fuel consumption.

Over last 50 years, aircraft industry got many changes due to increased air traffic through various processes of technology that has decreased the noise levels and fuel consumption. Technology which is new for use in aircraft engines like in a propulsion system design that involves advanced superconducting, cooled electric generators and motors in order to drive low noise electric fans which increases fuel efficiency.

Recommendation & Conclusion

Consumption of fuel and costs of current generation fuels like petrol etc. is a major problem of the aircraft industry. In total operating costs of aircrafts, cost of fuel constitutes the largest ratio. Many

organizations regulating aircraft industry and airplane manufacturers are trying to find ways to reduce fuel consumption. These researches have also focused to reduce emission of greenhouse gases and emissions of those pollutants which can cause illness.

There is a huge research going on to find alternate fuels, modify design to make aircrafts more fuel efficient. Next generation electric aircraft with new electric propulsion systems are in process to achieve a sustainable aviation. The main points which should be in mind while designing future aircrafts are noise made at airports should be reduced, burn of fuel should be reduced and also reduced of emissions (both pollutants and greenhouse gasses). There is a lot to be found in this area to make future aircrafts more fuel efficient, pollution free and achieve sustainable aviation.

References

Daggett, D. L., Hendricks, R. C., Walther, R., &Corporan, E. (2008). Alternate fuels for use in commercial aircraft.

Felder, J., Kim, H., & Brown, G. (2009, January). Turboelectric distributed propulsion engine cycle analysis for hybrid-wing-body aircraft. In *47th AIAA aerospace sciences meeting including the new horizons forum and aerospace exposition*(p. 1132).

Huang, H., Spadaccini, L. J., & Sobel, D. R. (2002, January). Fuel-cooled thermal management for advanced aero engines. In ASME Turbo Expo 2002: Power for Land, Sea, and Air (pp. 367-376). American Society of Mechanical Engineers.

Kim, T., & Kwon, S. (2012). Design and development of a fuel cell-powered small unmanned aircraft. *International Journal of Hydrogen Energy*, *37*(1), 615-622.

Kyprianidis, K. G., Grönstedt, T., Ogaji, S. O., Pilidis, P., & Singh, R. (2011). Assessment of future aero-engine designs with intercooled and intercooled recuperated cores. Journal of Engineering for Gas Turbines and Power, 133(1), 011701.

Lee, J. J., Lukachko, S. P., Waitz, I. A., & Schafer, A. (2001). Historical and future trends in aircraft performance, cost, and emissions. Annual Review of Energy and the Environment, 26(1), 167-200.

Luongo, C. A., Masson, P. J., Nam, T., Mavris, D., Kim, H. D., Brown, G. V., ... & Hall, D. (2009). Next generation more-electric aircraft: a potential application for HTS superconductors. *IEEE Transactions on Applied Superconductivity*, *19*(3), 1055-1068.

Nygren, E., Aleklett, K., &Höök, M. (2009). Aviation fuel and future oil production scenarios. *Energy Policy*, *37*(10), 4003-4010.

Rosero, J. A., Ortega, J. A., Aldabas, E., & Romeral, L. A. R. L. (2007). Moving towards a more electric aircraft. *IEEE Aerospace and Electronic Systems Magazine*, *22*(3), 3-9.

Senzig, D. A., Fleming, G. G., &Iovinelli, R. J. (2009). Modeling of terminal-area airplane fuel consumption. *Journal of Aircraft*, *46*(4), 1089-1093.

ARTIFICIAL INTELLIGENCE AND FUTURE OF HUMANITY

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What is Artificial Intelligence (AI)?

[1] It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to biologically observable methods. [2].Artificial Intelligence can be defined as the intelligence exhibited by the machines and programs that are created by humans to solve complex problems and scenarios.[3] Artificial intelligence is that activity devoted to making machines intelligent and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment. [4] Artificial intelligence (AI) is defined as intelligence exhibited by an artificial entity to solve complex problems and such a system is generally assumed to be a computer or machine.

History of AI

[5] The beginnings of artificial intelligence are traced back to philosophy, fiction and imagination. [6] George Boole was the first person to describe a formal language for logical reasoning in 1897. The next breakthrough for AI came in 1936 when Alan M.Turing defined the Turning-machine. Warren McCulloch and Walter Pitts created the model of artificial neurons in 1943 and in 1944 J.Neumann and O.Morgenstern determined the theory of decision. Donald Hebb introduced value changing the rule for the connections of artificial neurons that gives the chance of learning. Marvin Minsky and Dean Edmonds created the first neural computer in 1951. The term Artificial Intelligence was termed in the summer of 1956 by John McCarthy. This soon caught the attention of researchers and it was discussed at a conference in Dartmouth. John McCarthy was regarded as the father of AI. McCarthy announced the LISP language for creating artificial intelligence software. Herbert Simon in 1965 stated that "Machines will be capable, within twenty years, of doing any work a man can do". But they realized that this wasn't the case after a few years, it is almost impossible to create an algorithm that can do everything a man can do. The meaning of AI has changed in recent years, it is now considered as an intelligent thing or agent which will help us do our work in a faster and easier way. In 1970 first international joint conference on Artificial Intelligence was held in Washington, DC.

Growth of AI

[7] Artificial intelligence has been advancing rapidly in recent years in both the term of investment that went to it and also the outputs. The Economist has estimated that the number of AI-related companies has increased 26 times in 2017 than it was in 2015. This increase was due to huge improvements in the technical capabilities of AI over the past years. But there was also concern about the fate of human workers. For example, Elon musk stated that "AI is a fundamental risk to the existence of human civilization.[8]Artificial Intelligence can also be considered the 4th industrial revolution. Along with big data, AI has transformed all industries around the world.The systems which are programmed intelligence can outperform the deterministic system and are hardcoded when it comes to real-world related problems in terms of both accuracy and efficiency.AI helps to solve the problems related to business and business analytics.

AI in Healthcare Appliances

[9] Artificial intelligence is capable of organizing patient treatment or routes better and also provides the physicians with the information that they need to make the best decision in health care and medicine. AI reduce the time taken to make the data into comparable form to just a matter of seconds which would have taken hours of calculating if it is done by humans. Unlike doctors, AI doesn't need any rest and the number of patients doesn't matter due to this it helps to improve medical care.[10] The increased awareness by the experts in health care has resulted in the development of the Z-DEMATEL (Z- number decision making trial and evaluation laboratory) technique. Z-number method increases the reliability of the expert's decision and also optimizes the fuzzy number which helps to improve the confidence of the expert in the treatment of the patient. [11] Although the use of AI in healthcare will improve many things it is no panacea. [12]The treatment and diagnosis have been the focus of AI since at least the 1970s.MYCIN which was developed by Stanford for diagnosing blood-borne bacterial infections and other early rule-based systems showed promise for accurately detecting and treatment of the disease but they weren't clinically implemented. They weren't significantly better than human diagnosticians and the clinicians weren't properly trained to use the benefits and the medical records were poorly integrated.

AI in Manufacturing and Production

[2] Expert systems are those machines that are programmed to have complete expertise in a precise area of interest. They are programmed to solve the problem that may arise in those fields. These machines use data mining and statistical analysis to solve the problems through logical programs of yes-no questions. Once an artificial intelligence program is created it can be easily transferred to other machines whereas passing a similar amount of knowledge to other humans is a time taking and costly process.[13] Artificial intelligence makes the process of production and manufacturing much more cost-efficient. [14] Modern manufacturing and logistics systems are maintained by powerful computer networks. In these networks, enormous amount of data is continuously being generated by sensors, machines, systems, smart devices, and people. Together with Big data, AI has led to a new age called Industry 4.0 or Smart factory.[15] AI can be applied for various work such as quality inspection, optimizing the supply chain, fine-grained equipment monitoring and predictive maintenance, advanced robotics, generative design, augmenting human capabilities, transportation, etc.

AI in Security and Surveillance

[13] Artificial intelligence can be applied to identify the issues in systems and also can be programmed to detect security breaches. AI tools can be used to manage automated responses and control plans. [16] AI surveillance includes smart city platforms, facial recognition systems and smart policing. These help us to keep society safe, prevent crimes and respond to emergencies. Smart cities have sensors that transmit real-time data to improve service delivery, public safety and city management. These cities have incorporated facial recognition systems and police cameras that are connected to intelligent command centers.[17] Artificial intelligence has huge possibilities to optimize the way we fight against crimes and strengthen our national security. When there is an enormous amount of data and the need for quick decision-making AI can be of great use and may also lead to success. When the security forces are creating plans for multiple scenarios and performing various analyzes after going through a huge amount of information is a time taking

process. But AI has the possibility to drastically reduce the time required for this process and thus providing us most successful plans and also there are capable of detecting the flaws in the plans that are already made.[18] AI and Cyber security havea lot of intersecting points. AI technologies, such as deep learning can be used in cyber security for constructing smart models for finding malware, intrusion detection and threat intelligence sense.

Artificial intelligence in Education

Artificial intelligence is the most important technological force of the first half of the century.AI has the potential to transform virtually every industry including education. [19] For the past 25 years, The Artificial Intelligence in Education (AIED) community has been focusing mainly on solving the two-sigma problem by creating a program that is as effective as human one-on-one coaching. There have been significant advances that have increased the efficiencies and also reduced the time required for learning. Due to requirements of 21st-century skills such as the general learning skills and competencies such as metacognition, critical thinking, and collaboration.[20] AI at first took the form of computer and computer-related technologies, transitioning to web-based and online intelligent education systems, and ultimately with the help of embedded computer systems and other technologies the humanoid and web-based chatbots were used to perform instructor's duties and functions with a human instructor or even independently. With the help of this system, the instructor was able to review and grade the students more effectively and efficiently and also can achieve a higher quality of teaching. As these systems are based on machine learning and adaptability they can customize and personalize the course for a specific student's needs thereby improving the quality of learning and helping them understand in which they are lacking. Though AI in education has a lot of merits it still also has demerits. [21] Our passion for technology in education has a huge impact on the teacher-student relationship and also student-student relationships. The education is becoming more and more of I-It than I-Thou causing poor socializing skills. In the process of "Learnification", the teachers are understood as just mere facilitators rather than a person who has expertise in the field.

Advantages of AI

[22] As the technology evolves the risks, threats and vulnerabilities also evolve and to prevent the exploitations of these, foolproof end-to-end(E2E) security becomes a vital concern. The AI and ML play a vital role in modelling, designing and automating efficient security protocols against a wide range of threats. AI and ML have already proven their ability to higher accuracy. [4] Machine learning a branch of artificial intelligence has proven to be a strong method in predicting and analyzing the given set of data. With the help of machine learning, we can predict the weather with more than 90% accuracy. This plays a vital role in agriculture industries where the weather forecast is an important condition. [4]AI robots have become common in many heavy industries. These robots make production very efficient and much faster than before. As these robots don't get tired from working, it overcomes the inherent disadvantage of humans and also, they help the workspace safer as these robots are employed in jobs that might be dangerous for humans. [23] The use of artificial intelligence in the medical field is increasing continuously. It not only increases the efficiency and professional level; it also avoids medical errors. In developing countries, the difference between the health care service in the urban and rural areas are huge. But by implementing AI medical techniques the difference can be reduced and also by training the health worker to use AI medical techniques we can compensate for the lack of physicians. [4] One of the

major advantages of artificial intelligence is that its decisions are based on facts rather than emotions. Even after our utmost efforts, it is a well-known fact that human decisions are always affected negatively by our emotions.Easier spreading of knowledge. Once an artificial mind is trained for something, it can be very easilycopied to the others reducing the time wasted in otherwise passing on knowledge to other humans through training. AI has improved the gaming industry. One of the most commonly known applications of AI in the gaming industry is its use in chess. AI is also being used in Microsoft Xbox 360″ s Kinect for body motion detection. Expert Systems are machines that are trained to have total expertise in specific areas of interest. They are developed to solve problems in niche areas. These systems use statistical analysis and data mining to solve these problems by deducing the solutions through a logical flow of yes-no questions. [24] Artificial intelligence provides advantages of permanency and is reliable. Artificial intelligence increase cost-effectiveness in many fields. AI programs are capable of dealing with both qualitative and quantitative data, a feature that most strictly analytical methods lack. AI can reduce the need for personnel time since the AI will take care of the decision-making process and AI tools can facilitate faster decision making by automating the decision-making process.AI tools can be applied to identify the security breaches, and in the development and management of automated response and control plans.AI can be used to manage the transportation system and also for the development of the system.

Challenges or Dis-advantages of AI

[25] One of the main disadvantages of AI is the cost of maintenance and repair. The software must be continuously updated to keep it useful and to meet the requirement of the time. In case of any problem, the cost for repair could be huge and maybe even need to do redo the entire program to meet the requirements. [26] The use of AI has many advantages but still, it can't completely replace teachers. The robots not only don't have emotions they are not able to closely monitor the personalized improvement of the students in the class. Education is not only about teaching facts it is also about the teaching discipline, manner and many others which may include emotional support from teachers which is impossible to provide by an AI robot. [27] The biggest threat of AI is that it could be weaponized and could be used be for mass destruction rather than for the improvement of the lives of the people for which it is intended. AI can shake up armed conflicts as nuclear weapons did. The countries like US, Russia, China all have invested a lot in AI for military purposes. The AI is not a threat itself; it depends on how we use it. It can be considered as a double-sided sword, whether it does good or harm depends on the person who has it. This makes us in a constant state of fear as we don't know when who might use it for the wrong purpose. [24] The industrial and digital revolutions have had both merits and demerits. This revolution has affected our society and life. AI has made the younger generation lazy and more dependent on technology. Human jobs have been affected due to the AI robots taking their place which caused more unemployment. The potential of the AI program completely depends on the creativity of the programmer. [28] The implementation of AI in healthcare is done by not only AI, it includes ML (Machine learning) and DL (deep learning). The drawbacks of the implementation of this technology are that it's not transparent and lacks interpretability. [4] The responses from AI lacks creativity and is not able to explain the logic and reasoning behind a certain decision.Due to the inability of reasoning for a decision, if there is a malfunction, we may end up wrong decision which says that if we rely on AI blindly it may lead to problems rather than the solution for the problem. [29]Even though they are more efficient in doing

work they can't replace human connections that create teamwork. Since they can't form bonds with humans there is no possibility of teamwork. Machines can perform only that task which they are programmed to, if any malfunction happens it will lead to a huge backdrop and also the cost repairing it huge.

Conclusion

AI is something humans have been dreaming about for a long time. It is finally becoming a reality, even though we haven't unlocked its full potential yet we are still able to reap incredible value from AI and its related fields. Everything in the universe has its merits and demerits which goes the same for AI. We can't classify AI as only good or bad for humans. The AI is like a double-edged sword, though it has a lot of benefits it still has the same number of drawbacks. It is capable of improving human life ona huge scale but if it is used in the wrong way it also has the potential to end human civilization itself. AI has improved the cost and work efficiency to a huge amount but it also caused unemployment as humans are being replaced by robots and machines.As AI is continuously taking over one field and then another, we need to have the ability to code or our jobs will be replaced by the robots in future. AI is created for making our easier and comfortable but in the end, it may make our life too comfortable which will lead to a lazy lifestyle without much physical activity. Due to less physical activity along with our worsening food style(Junk foods), we may get a lot of health problems in future. I think at present AI isn't at full potential but when it reaches it, the AI might become the single toolthat can do everything. When it has reached its full potential, we should our best in making sure that it doesn't fall into wrong hands that way we can enjoy a comfortable and improved lifestyle, if we forgot to protect AI and it falls into the wrong hand then the result might be devastating.

References

Bartoletti, I. (2019, June). AI in healthcare: Ethical and privacy challenges. In *Conference on Artificial Intelligence in Medicine in Europe* (pp. 7-10). Springer, Cham.

Benko, A., & Lányi, C. S. (2009). History of artificial intelligence. In *Encyclopedia of Information Science and Technology, Second Edition* (pp. 1759-1762). IGI Global.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intelligence. Aayushi International Interdisciplinary Research Journal, 227-230.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Carriço, G. (2018). The EU and artificial intelligence: A human-centred perspective. *European View*, *17*(1), 29-36

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Crandall, D. J. (2019). Artificial intelligence and manufacturing. *Smart Factories: Issues of Information Governance*, 10-16.

Davenport, T., & Kalakota, R. (2019). The potential for artificial intelligence in healthcare. *Future healthcare journal*, *6*(2), 94.

Feldstein, S. (2019). *The global expansion of AI surveillance* (Vol. 17). Washington, DC: Carnegie Endowment for International Peace. [13]Radulov, N. (2019). Artificial intelligence and security. Security 4.0. *Security & Future*, *3*(1), 3-5.

Furman, J., & Seamans, R. (2019). AI and the Economy. Innovation policy and the economy, 19(1), 161-191.

Ghimire, A., Thapa, S., Jha, A. K., Adhikari, S., & Kumar, A. (2020, October). Accelerating business growth with big data and artificial intelligence. In *2020 Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC)* (pp. 441-448). IEEE.

Guilherme, A. (2019). AI and education: the importance of teacher and student relations. *AI & society*, *34*(1), 47-54

Guo, J., & Li, B. (2018). The application of medical artificial intelligence technology in rural areas of developing countries. *Health equity*, *2*(1), 174-181.

Haider, N., Baig, M. Z., & Imran, M. (2020). Artificial Intelligence and Machine Learning in 5G Network Security: Opportunities, advantages, and future research trends. *arXiv preprint arXiv:2007.04490.*

Hsu, W. C. J., Liou, J. J., & Lo, H. W. (2021). A group decision-making approach for exploring trends in the development of the healthcare industry in Taiwan. *Decision Support Systems*, *141*, 113447.

Li, J. H. (2018). Cyber security meets artificial intelligence: a survey. *Frontiers of Information Technology & Electronic Engineering*, *19*(12), 1462-1474

McCarthy, J. (2007). What is artificial intelligence?

Murali¹, N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Nilsson, N. J. (2009). The quest for artificial intelligence. Cambridge University Press.

Osipov, S. S., & Ulimova, N. V. (2013). ADVANTAGES AND DISADVANTAGES OF AI. *SCIENCE AND WORLD*, 77.

Radulov, N. (2019). Artificial intelligence and security. Security 4.0. *Security & Future*, *3*(1), 3-5.

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education*, *26*(2), 582-599

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Tao, B., Díaz, V., & Guerra, Y. (2019). Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher. *Arctic Journal*, *72*(12), 30-50.

Thaler, S., & Menkovski, V. (2019). The role of deep learning in improving healthcare. In *Data Science for Healthcare* (pp. 75-116). Springer, Cham.

INTEGRATING TECHNOLOGY IN AGRICULTURE

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Abstract

RFID or Radio frequency identification is a very secure method of identifying and channelising information related to agricultural products and devices through a small tag attached to them. It can develop agriculture tremendously by sharing real time data about agricultural devices like temperature or soil nutrient level sensor, status of all automatic agricultural devices. Study and research in biotechnology can lead to further increase in gross agricultural yield , quality of yield. It can help manipulate the biological systems fo better results. The use of IOT to integrate all devices to essentially improve certain aspects like perceiving information about plant and its environment, transportation of goods and application of machines by use of technology like Wifi, gprs, Zigbee, Bluetooth etc.. to convert smooth efficient and hassle free production of crops has been discussed in this paper. Wireless Sensor Networks(WSN) are basically use of sensors to precisely monitor conditions of the field and to predict weather conditions and to suitably adopt its operations. All of these together constitute a field wherein great innovation can be brought about. Farmer fields schools (FFS) are another thought discussed in this paper which can be used to further extend the knowledge of scientific agriculture amongst farmers. Another aspect of the digital world that is Information technology can be further used to Improve logistics of farm produce, competetivepricing , product user base and marketplace .beyond all a fairer margin of profit for the farmers can be ensured through the direct contact of farmers to the users through IT. Concept of Precision Agriculture is one which requires further perfection but promises ample of quality produce enough to satisfy the growing population. It utilises the idea of WSN by using web of underground nodal sensors. Lastly the technology of Nano particles is the other non- conventional method which can bring about huge changes in the agricultural economy if properly researched upon. The use of small particles to only affect the required regions with low levels of dosing of fertilizers or nutrients is one of the main objectives of nano particle technology. It is highly likely that one of the above methods can change the course of current agriculture to greater heights hence it is highly adviced to encourage research in the above fields.

Keywords: RFID, WSN (Wireless Sensor Networks), IOT, Biotechnology, Nano technology, PA (Precision Agriculture).

Introduction

Leveraging technology is the application of relevant scientific knowledge for practical purposes in specific industries. Use of modern age technologies in fields of IT and Biotech, as well as practices, tools and machines to enhance and improve the yield produced and to further reduce labour and time invested can be called agriculture technology. This also includes leveraging information technology, sensors, big data, cloud services, drones, hardware and software for innovative farming practices.

It is important to look into this matter because of humongous challenges as well as opportunities in an increasingly interconnected global economy. The relevance of talking and studying about technology and agriculture in our society is in order to motivate young minds who find interest in developing technology for the agriculture sector, but who may be potentially discouraged by a

society which sees very little or no worth in agriculture as a whole; for making money or earning a living. Being a citizen of the world, it's our responsibility to spread the awareness of the hardships faced by our farmers and to help them get acquainted with the knowledge and technology to bring about a change in the situation. It is a collective responsibility of mankind to keep up the production of the necessary daily food for their nourishment. Therefore, thinking about innovation in agriculture is a big deal, being a win-win situation for both the farmers and consumers.

Literary Survey

[1] RFID means Radio frequency Identification. It is used in improving many agricultural processes. It uses radio waves to interpret information stored on a tag attached to an object. RFID makes use of sensors for wide range of applications. RFID provides a plethora of applications for productive output in agriculture. RFID is used for trace ability and monitoring live stock. By using RFID, we can find weather conditions and we can produce better yield. It is new technology which was brought to produce better production and yields without any loss. RFID has most of use with sensors and some new tools which are outfitted with sensors. RFID has good market and it's use is very commercial. Using RFID in agriculture has brought a new revolution in agricultural industry which was never expected. [2] Biotechnology is coming very handy in agriculture. The knowledge of biotechnology can lead to better yield, productivity, product quality and export diversification. Biotechnology driven improvements are enhancing the quality of input and output in agriculture related activities. It is the manipulation of various biological processes for industrial purposes and other things but now it is also being used in the field of agriculture. It is commonly termed as Agritech. The new technology offers greater chances for increased growth in areas of income, nutrition, etc. The new tools of genomic study are increasing the insight of biological system and also how to manipulate them for better results. The research in molecular breading, genetic mapping, changing of plant architecture and bio-safety has tremendous potential to impact the quality of crops. The improvements in global agriculture needs creative science as well as development of plant-derived products with high returns. This paper discusses about growth of traditional agricultural and industrial sectors, including natural resource-based sectors. [3] IOT means Internet of things. IOT has wide range of application on agriculture. There are three layers in IOT. They are perceive, transportation and application. By using perceive layer they will acquire the information of which crop should be done on that land, conditions of soil and conditions of environment in that area. Transportation means in this we use WiFi network and GPRS, Bluetooth connections for intelligent networking methods. The use of WiFi and Bluetooth is multidimensional information fusion. There is wide range of application of IOT in agriculture industry. Those are the three layers which are used in modern agriculture to put IOT forward. [4] Wireless sensor networks (WSN) has become an important part in tremendous growth in field of agriculture. It is new technology and ideal candidate for solutions to various problems that include, agricultural issues, monitoring of health. It brings with itself a plethora of knowledgeable aspects of automation control, storage of information digital network transmission, etc.. Its development has helped in controlling and monitoring of greenhouse parameter in agriculture. In Precision Agriculture (PA), different methods and techniques are used to monitor the necessary environmental parameter for particular crop. Because of uneven distribution of rain water, wireless sensor networks help to meet the necessary requirements of different crops. The farmers who are not acquainted with any scientific knowledge bear loss due to wrong techniques and predictions of weather. The various types of

sensors and Programmable Systems on Chip technology (PSoC) have made agriculture much easy. [5] FFS means farmer field schools and CIAL'S means local agricultural research committees. Those are the two things which are used in promoting integrated decision and making innovation in agriculture to help farmers. It is mostly used by Asian farmers and it is mainly developed in Asia. In Asia there are around 200 million rice farmers. FFS has four principles of IPM. They are to grow a good crop, protect from natural enemies like pests and insects, to check field regularly and to become best by participating in FFS. FFS requires best support from national wide. FFS believe that future development will be based on this. These FFS should develop everywhere around the world and should bring better output than before. [6] The agri-food sector is prone to various global challenges which requires the support of information technologies (IT). It provides a platform to help agri-food sector to cope up with challenges and pave way for development and advancement of integrated digital environments. The technology advancement can be difficult to predict due to lack of understanding or knowledge or social factors. IT helps in reorganisation, integration of agri-food sector and its possible future outcomes. [7] PA means precision agriculture. PA needs tools to evaluate the growth of world and it needs a series of practices. Increase in the population around the world has unfavourable effects on the agriculture. Because need of more food for this much population is forcing farmers to use various pests and chemicals to enhance and better the productivity. This is affecting the farming lands. Demand for food is encouraging production and throwing into new generation known as precision agriculture. In PA, wireless sensor nodes are being used. These sensor nodes gives us hint of moisture in soil and predicts the temperature. By knowing these things they will practice farming in a manner which produces higher productivity. This is the use of precision agriculture(PA). [8] The 21st century might turn out to be a time of transition of agriculture into water efficient and intelligent mechanical agriculture along with other desired qualities like high quality, high quantity and pollution free agriculture. Digitalization of agriculture can become the major factor which can help to bring about such a change in the agricultural scenario. The essence of agricultural digitization is to digitize every aspect (crop production, animal husbandry, aquatic products industry, forestry etc.) and every step/process of agriculture (like from sowing to harvesting and storage for crop production). Agricultural digitalization has been developing rapidly in the last decade especially in the developed countries. For example; in Japan, computers are being widely used in farming for accessing weather forecast reports, insect utilization, agricultural operations and product processing. In the united states the farmers have access to huge information databases of the governmental information centres, research institutes, libraries and agricultural universities. This helps them to get latest data about current market prices for their produce, new agricultural equipment, latest farming techniques, seed melioration , prevention and treatment of plant diseases and pests and so on… The concept of IoT i.e. interlinking of all the devices to a single network to provide a smooth and hassle free efficient coordinated execution of a process can further help the farmers to get all their concerns cleared by just a single integrated software which can provide them with suggestions over best crop for their geographic conditions , amount and type of pesticide to be used, best type of farming cycle for their geographical terrain etc. This can be further combined with suitable machinery to enable automation of farmlands through sensors which detect weed, detect crops and their need for water i.e. if the soil has become too dry in combination with precision engineering of machines which can burrow, sow, harvest and store produce. [9] New methods of enhancing crop growth and quality of produce keep on being explored and one of the many inventions which can improve the art of agriculture a lot is Nano agriculture.

Nano agriculture involves the use of small particles of size of the order of a few hundred nanometres called nano particles which can be used to sense and release certain substances on demand to certain specific target areas. For example, nano particles can be used to apply fertilizers or pesticides to crops instead of conventional spraying of fertilizers, which will ensure even and correct levels of chemicals across the field. Nano particles will also help prevent crop diseases by sensing anomalies and ejecting the remedy for it even before we can observe it on the macro scale. It also supports sustainable agriculture immensely because normally pesticides deteriorate the quality of soil by formation of oxidative stress on the soil and hence polluting it with oxygen free radicles. Nano particles can also be used as a mediator for plant gene modification for favourable changes in their genetic structure to improve resistance to diseases and to improve quality of produces and similar favourable traits. Nano particles also are used to make carbon nano tubes which can be used to deliver required molecules to a germinating seed ensuring its healthy growth. [10] Information Technology is nearly being used in all the fields and it has been high time that it may also be introduced to the agriculture in developing countries. It can be used as a platform for peasants to learn about the current market prices and condition of the agricultural economy. IT can be used to avail the latest and greatest technological machines for to the farms of the farmers. These can be employed to give notifications and updates about climatic conditions to the farmers. They can be used as a platform for cultivators to trade and pool their resources amongst the other farming community to reduce costs and to save time. They can then utilise IT to send information and status of their farmlands to remote agricultural research centres for improvement and advancement in methods of farming. It can also be utilised by farmers to clear their queries about non-conventional farming methods at remote agricultural help centres. It can be used for big data services enabling farmers to access various government databases and university databases helping them get the knowledge to farm more efficiently and to find buyers to sell their buyers at the right price.

Findings

Technology leverage in agriculture provides a three-pronged approach to better productivity, efficiency and effectiveness of farming practices. Firstly, Information Technology enables innovation through RFID devices, Wireless Sensor Networks as well as through IoT and digitalization of agriculture to provide better information for decision making and better management of agriculture. Such enablement is not only at technology level, but also considers other factors such as social, economic, geological and climatic factors. In addition, it encompasses integrating various different parameters and factors to provide a holistic solution to significantly improve and innovate agriculture practices and outputs.

Secondly, biotechnology and nano-technology driven improvements are helping improve quality of both inputs for agriculture as well as outputs of agriculture and related activities. It focuses on research based improvements of crops, especially on quality and yields through continuous efforts on developing better and more resilient strains of crops.

Thirdly and lastly, the technology advancements are supported by both identifying and implementing better tools, practices and mechanisms. Practices such as Precision Agriculture and initiatives such as Farmer fields schools and local agricultural research committees are enabling efforts to improve agriculture substantially. Moreover, it requires all stakeholders such as farmers, public organizations and private enterprises to work and collaborate together and share best practices and learnings globally.

Recommendation and Conclusion

From the above detailed summary of the topic '' Integrating technology in agriculture '', we can conclude that integrating technology in agriculture is very productive and useful. By using RFID, FFS, CIALS, IOT and PA in agriculture brings a drastic change in agriculture industry. RFID, PA and IOT are technical methods which are used to develop agriculture and FFS and CIALS are non-technical methods used for development of agriculture. The technology development in one country should help other countries to develop in their agriculture and it removes boundaries between the countries. FFS is the most useful method to bring awareness in farmers about farming. These are the process which increase the productivity in the agriculture by using technology in agriculture.

References

Cox, Sidney. "Information technology: the global key to precision agriculture and sustainability." Computers and electronics in agriculture 36.2-3 (2002): 93-111.

DD Chaudhary, SP Nayse, LM Waghmare, "Application of Wireless Sensor Networks for greenhouse parameter control in precision agriculture" International Journal of Wireless & Mobile Networks (IJWMN) Vol 3 (1), 140-149,2011

Dong, X., Vuran, M. C., & Irmak, S. (2013). Autonomous precision agriculture through integration of wireless underground sensor networks with center pivot irrigation systems. Ad Hoc Networks, 11(7), 1975-1987.

Gerhard Schiefer, "New technologies and their impacts on agriculture, environment and food industry" Proceedings of he EFITA 2003 Conference 5 (9), 2003

He young, Niepengcheng, LiuFei Translations of the Chinese Society for agriculture. Machienry44(10),216-226,2013

JH Dodds, R Oritz, JH Crouch, V Mahalasksmi, KK Sharma, "Biotechnology the gene revolution and proprietary technology in Agriculture" IP Strategy Today 2, 2001

Ruiz-Garcia, L., &Lunadei, L. (2011). The role of RFID in agriculture: Applications, limitations and challenges. Computers and Electronics in Agriculture, 79(1), 42-50.

Srilatha, B. "Nanotechnology in agriculture." Journal of Nanomedicine and Nanotechnology 2.7 (2011).

Warnick, B. K., & Thompson, G. W. (2007). Barriers, Support, and Collaboration: A Comparison of Science and Agriculture Teachers' Perceptions regarding Integration of Science into the Agricultural Education Curriculum. Journal of Agricultural Education, 48(1), 75-85.

Yan-e, Duan. "Design of intelligent agriculture management information system based on IoT." Intelligent Computation Technology and Automation (ICICTA), 2011 International Conference on . Vol. 1. IEEE, 2011.

ARTIFICIAL INTELLIGENCE-THE FUTURE

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What is Artificial Intelligence?

[1] It is combination of science and engineering which makes intelligent machines,specially computer programs which are intelligent. It is used to understand human intelligence,but artificial intelligence does not have to copy the methods which are biologically observable.

Artificial intelligence is the field of the computer science which is trying to build powerful intelligence into computer systems.

[2] Artificial intelligence is the combination of the three academic disciplines which are psychology (cognitive modelling), philosophy (philosophy of mind), and computer science. These three disciplines belongs together for so many purposes but it's difficult task to join them together. Psychology and philosophy got split up in the late nineteenth century. As a branch of mathematics computer science grew up. Computers are required as tools for modelling of mental states and processes. There are lot of practical application of artificial intelligence which contains computer systems design which can perceive, learn, understand, solve problems, making of plans, conversation in natural language. These systems are already in use for medical diagnosis, identification of ships from satellite pictures, prospection of minerals, science training and translation of the language. With the help of artificial intelligence computers role changes from something useful to something essential. The main aim of artificial intelligence is to make computer to perform task that humans are good at.

History of Artificial Intelligence

[3] In its early days, artificial intelligence is based on friction, imagination, philosophy. AI is influenced by the early inventions in electronics, engineering and many more.There are early achievement which include work in the solving of the problem including basic work in learning, representation of knowledge, and inference as well as demonstration programs in language understanding, theorem proving, associative memory, knowledge-based systems.The history of artificial intelligence is filled with demonstrations, possibilities, and promise.

[4] The birth of artificial intelligence was in the summer of 1956. It's term was coined by John McCarthy. At that time subject got its first attention by researchers. It was also discussed at some conference at Dartmouth. After one year, the first problem solver was tested. The statement of Herbert simon was that machine would be capable of work done by man in twenty years.

[5]After some year scientists realised that creation of such algorithm which can do any task is impossible. Now Artificial intelligence has a new meaning which is creation of new agents to do our works easier and faster. In 1950 there is suggestion from Alan Turing that definition for deciding whether software is intelligent or not. In the theory of Alan turing, we can measure software intelligent behaviour like human intellectual efficiency. The software is intelligent when human being don't know whether a person is texting with human or of software.

Growth of Artificial Intelligence

[6] In few decades artificial intelligence has grown a lot. It became part of life of people living in modern society. It helped world in many ways from innovation to health care.AI made transformed business environment completely

[7] AI deployed in the goods production and services increased economic growth and income shares.

[8] All types of companies started implementing artificial intelligence. AI help in labour cost reduction. It also has improved the productivity of industries. It solved many problems of society like problems of science, government etc.

Artificial Intelligence in Healthcare Appliances

[9] Pressure sensor devices has large application in personal electronic devices and industrial monitoring and pressure sensors are good contender for upliftment of science and technology in our modern society. Flexible pressure made from organic materials has the unique advantage of flexibility and it is also low cost. It has emerged as highly active field because of their encouraging application in artificial intelligence systems and health care devices which are wearable. The electrical sensing techniquesand organic electronics are quickly moving forward and they have contributed a lot in development of flexible sensors. It has the advantage of very excellent flexibility, cost effective, and it is compatible with large area processing techniques. Many flexible sensors are made from organic materials and it has been fabricated .The sensing capacities of flexible sensor can even surpass human skin. The application of pressure sensors has application of mobile biomonitoring in medical diagnostics and in health care. Flexible pressure sensor from organic material gives potential opportunity for development of excellent application.

[10] Artificial intelligence is the part of computer science which imitate human psychological functions. It brought standard shift in the medical field due to the presence of increment in healthcare data and increase in analytic techniques. Recently artificial intelligence has surpassed human being performance in various field of medical. By the use of analytical techniques, artificial intelligence is capable of preventing, detection, diagnosis, and treatment of wide range of diseases. The use of artificial intelligence is growing rapidly in medical field. Artificial intelligence helps in treatment management and diagnosis. There is creation of tension of Artificial intelligence which is surpassing of human tasks and ability. Many research paper showed that in future artificial intelligence has the capacity to support judgement of human, aid in clinical disease and increase in treatment efficiency. Artificial intelligence is used in many health care places in the world and it has made life of patients and doctors easy. It makes simple by performing important and complex task in no time and at very less cost.

[11] Artificial intelligence in healthcare can be used for inspection of patients, making patients record more well organised. It can also be used to monitor disease and aiding of diagnosis, assisting in surgical processes. It can also offer mental therapy to the patients. Artificial intelligence helps in scheduling patients, billing., staffing optimization, protocols creations, assertion of image quality, reduction of dose of radiation, and interpretation of images. These are the things we can do with artificial intelligence in radiology. We should not fear from artificial intelligence as it will not replace human beings. Artificial intelligence should be welcomed for its capability to improve and prolong human lives.

[12] Technology of wearable are the emerging tools of personal gadgets. Apart from being fashionable and with advance hardware technologies like communication modules and networking. Wearable device has capability to boost artificial intelligence with variety of valuable data. Artificial intelligence techniques like supervised, unsupervised, semi-supervised and reinforcement learning. These are already in use to carry out various tasks. The application of artificial intelligence in wearable is in sport, industry, and medical purposes. Sports application are used to give better experience during workout to users.

Artificial Intelligence in Manufacturing and Production

[13] Powerful computing networks supports modern manufacturing and logistics systems. In these networks plenty of data are being generated continuously by sensors, machines, systems, smart devices, and peoples. Big data are being analysed faster, broadly, deeper than ever before by the rise of computational capabilities. The value of artificial intelligence are redefines by these advance technology and opened new age known as industry 4.0 or the smart factory. Advance cognitive computing and deep learning methods had started to find application in the manufacturing systems for automated visual inspections, fault detection, and maintenance. There are so many active stronger learning methods to the material handling systems and production scheduling. Industries are trying to convert the real-time data into decision which are actionable.

[14] New revolution of technology and industry are gaining momentum. It is believed that new era of internet and artificial intelligence specified omnipresent networks, datadrivenness, shared services, cross- border integration, automatic intelligence, and mass innovation is coming. The rapid fusion and development of new artificial intelligence technologies along with internet technologies , new generation information technologies, new energy technologies, material technology, and biotechnology are essential parts of this new era, which will enable changing transformations of means, models, well being, and ecosystems in terms of the application of the economy of nation as well as nation security. The manufacturing industry is the backbone of nation economy, people's livelihood, and national security . There is game changing transformation in terms of manufacturing models , manufacturing approaches and its approaches. In current scenario the internet, existence of sensors, arrival of big data, development of e-commerce are getting popular. There is rise of information community, and interconnection of fusion of data and knowledge with the society, physical space, and cyber phase. These emergence of new technology allow new phase for the Artificial intelligence.

[15] The internet based swarm intelligence, technology-oriented human machine hybrid augmented intelligence are the main intelligence of artificial intelligence 2.O. The rapid evolution of smart cities, intelligent medical facilities, smart transportation, smart logistics, smart robots, self driving cars, smartphones, intelligent toys, smart communities, intelligent economy and many more provides huge driving force and market demand for development of artificial intelligence and its application. It is believed that intelligent manufacturing is the new manufacturing model. The new models are internet based, service oriented, collaborative, customizable , flexible, and internet manufacturing system which is socialised to provide production and services to users. The new form of intelligent manufacturing is the intelligent manufacturing ecology with the quality of omnipresent interconnection, cross border integration, autonomous intelligence, data drivenness, and innovation in mass.

There is new mean of intelligent manufacturing which are human-machine integrated smart manufacturing systems which features digitalisation, Internet of things, virtualisation , service, collaboration, customization, flexibility and intelligence. If the application of these models, forms, means are deeply integrated then it forms an ecosystem of intelligent manufacturing.

Artificial Intelligence in Security and Surveillance

[16] There are greater possibilities to make best use of Artificial intelligence in fighting against crimes and to make national security stronger. Artificial intelligence can bring success in the need for quick decision making and circumstances of unthinkable accumulation of data. Process like intelligence, counterintelligence, forensic science, counteracting organised crime, quick processing of available data, drafting of decision, creation of plans and multivariation of circumstances, analysis are very time consuming. By the use of artificial intelligence can only reduce time and in result increasing possibilities for detection, prevention and restrain crime.

[17]There are lot of application of artificial intelligence for security of nation in United States and other parts of world. There are lot of application of artificial intelligence for national security. The applications are cyber security, information security, diplomacy, homeland security, defence. This is not only the complete list of possible application of artificial intelligence.

[18] Cyber surveillance is less labour intensive as compared to human surveillance method which it has replaced. The increase in use of machine learning can grow the trend of artificial intelligence. Researchers at Microsoft and Pacific Northwest National Laboratory have revealed a technique to use neural network and generative adversarial network for the automatic production of malicious inputs and find which inputs will lead to the discovery of security related vulnerabilities. In traditional method, those type of inputs are tested by randomly modifying the non- malicious input. Militaries all around the earth are assimilating robotics and autonomous systems into their forces. Artificial intelligence and machine learning will enable systems to tackle more difficult and challenging tasks in large environment. In combat operations, the robots, swarms and autonomous system has the capability of increasing the pace of fight. Artificial intelligence can also give more power to the advance sensors and communication. AI can help in Situational awareness by use od small robotic sensors which can be used to collect data, Artificial Intelligence sensors senses and processes data which could help in better understanding of data.

Artificial Intelligence in Education

[19] Artificial intelligence is the techy force of this century, and it will make all industry advance directly or indirectly. Huge amount of money are invested by government and businesses for application and lot of start-ups are being funded.

[20] Artificial intelligence supports student-support chatbots, student writing analysis, intelligent agents in game based environment, tutor facilitated by Artificial intelligence by which student can do their own learning, analytic learning. It facilitates one-on-one student interaction with the computers.

[21] AI will allow creation of robots which will uplift learning experience of students from childhood education. Cobots in collaboration with teachers can be applied to teach daily tasks with greater efficiency. It can also be used in teaching spelling and pronunciation.

[22] The online education platform has transformed a lot from providing materials online to study, download, and do assignment to pass to include student friendly, brilliant system which can analyse student and teachers behaviour.

[23] Artificial intelligence provides adaptive learning personalisation and learning styles, expert system and intelligent tutoring systems. AI is the future component of education.

Advantages of Artificial Intelligence

[24] Artificial intelligence gives advantage of solidity, trustability, limitlessness. It provides cost-effectiveness. AI has lot of application in engineering, medicine, law, manufacturing, construction, linguistics, etc. AI provides permanency that prevents loss of knowledge when the individual or group of member retire or are no longer available to the organisation. Artificial intelligence enhances development of learning capability.

[25] It improves efficiency of bank processes like KYC(know your costumer), scoring of credit, automation, classification of documents. It helps in development of security and controls of risks like monitoring and detection of money laundering. It monitors payment transaction. It also help in prevention of fraud. It enhances costumer experiences, satisfaction, interaction by voice banking, biometric authentication, costumer segmentation, chatbots, robo-advice, targeted costumer offers.

[26] Computer network and artificial intelligence has positive and powerful impact in revolution of manufacturing and production industry. With the wide availability of artificial intelligence product like sensors, smart devices, machine productivity has increased in recent time. With the use of artificial intelligence, product are analysed faster, more deeply and broadly. With introduction of the artificial intelligence efficiency, quality of the product has increased.

[27] It also provided with cost-effective and environment friendly. These all resulted high competition of manufacturing enterprise or group in market. Artificial intelligence is used also in designing the environment cost control of manufacturing sector.

[28] Artificial Intelligence helps in advancement of imaging modalities like ultrasound, mammography, magnetic resonance imaging, and tomosynthesis. It helps in detecting malignant lesions in the early stages and improve prognosis of breast cancer patients. By the use of machine learning software radiologist may increase their efficiency and free up more resources. AI software also includes second opinion, access malignancy, patient assisting in triage.

Challenges or Disadvantages of Artificial Intelligence

[29] It can be misused which can leads to large scale destruction. It affects human jobs. It makes younger generation lazy. There is increase in technological dependency. It is very time consuming and expensive. Mismatch of problem sometime done opposite to command.

[30] It is not easy to develop the machines as equipment are expensive. Machine cannot develop bond with human beings which is important for team management. Machine can only perform tasks which they are designed too, anything which is out of that leads to crash or give irrelevent outputs. Human interference is getting reduced.

[31] Legal action and foregoing regulation which follows identification of situations are challenged when it comes to making right decision. Artificial intelligence has multifaced character. We have the ability to write algorithms, but who wants to drive a car which can kill you to save other people.

[32] Artificial intelligence in military has high risk such that AI system need to be transparent in order to gain trust of decision maker and provide risk analysis. Artificial intelligence system of military should be reliable and rubust,it is a challenge as AI may be prone to unnoticeable manipulations of data entry.

[33] In the course setting college business English majors, there is lack of practical teaching skills to enhance the spirit of Artificial Intelligence. Many university have conducted AI ideological education activities, but due to some reasons AI ideological education level is still low. The practice and application of Artificial Intelligence is still undivisible as there is lackage of practical link.

Conclusion

In my own opinion Artificial Intelligence is the future. It can solve many real word problems.

It is very beneficial for human beings. It has many application like in military, ethics security and surveillance, agriculture. The automation made task easier and cheaper. Artificial intelligence is very useful in healthcare sector as it reduces the risk. Artificial intelligence can benefit business by understanding costumer better and give them quick response to their requirements. Artificial intelligence can be highly beneficial for agriculture as it can improve the harvest quality and prevent plant diseases. It can help in prevention of destruction of crops. Artificial intelligence can enhance irrigation and farming systems. Artificial intelligence can improve can improve efficiency of human workplace and can do human work. Artificial intelligence can be dangerous. There are many risks associated with Artificial intelligence like privacy violation, loss of human jobs, weapons automization, Artificial intelligence terrorism, socio economic inequality, Artificial intelligence has both good and bad effect. If we use Artificial intelligence in wisely it can benefit human very much.

References

Abdulov, R. (2020). Artificial intelligence as an important factor of sustainable and crisis-free economic growth. *Procedia Computer Science*, *169*, 468-472.

Aghion, P., Jones, B. F., & Jones, C. I. (2019). *9. Artificial Intelligence and Economic Growth* (pp. 237-290). University of Chicago Press.

Agrawal, A., McHale, J., & Oettl, A. (2019). *5. Finding Needles in Haystacks: Artificial Intelligence and Recombinant Growth* (pp. 149-174). University of Chicago Press.

Attila Benko, Cecília Sik Lányi Encyclopedia of Information Science and Technology, Second Edition, 1759-1762, 2009. History of artificial intelligence.

Attila Benko, Cecília Sik Lányi Encyclopedia of Information Science and Technology, Second Edition, 1759-1762, 2009.History of artificial intelligence.

Bo-hu Li, Bao-cun Hou, Wen-tao Yu, Xiao-bing Lu, Chun-wei Yang, Frontiers of Information Technology & Electronic Engineering 18 (1), 86-96, 2017. Application of artificial intelligence in intelligent manufacturing : a review.

Bo-hu Li, Bao-cun Hou, Wen-tao Yu, Xiao-bing Lu, Chun-wei Yang, Frontiers of Information Technology & Electronic Engineering 18 (1), 86-96, 2017. Application of artificial intelligence in intelligent manufacturing : a review.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

chen fu chien,stephane dauzere peres, woonghee tim huh ,young jane james .international journal production of research 2020.

Chen, M., Liu, Q., Huang, S., & Dang, C. (2020). Environmental cost control system of manufacturing enterprises using artificial intelligence based on value chain of circular economy. Enterprise Information Systems, 1-20.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Darius Nahavandi, Roohallah Alizadehsani, Abbas Khosravi, U Rajendra Acharya, Computer Methods and Programs in Biomedicine, 106541, 2021.Application of artificial intelligence in wearable devices: Opportunities and Challenges.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., & Scharre, P. (2018). *Artificial intelligence and international security*. Center for a New American Security.

Ku Chhaya A Khanzode, Ravindra D Sarode, International Journal of Library & Information Science (IJLIS) 9 (1), 3, 2020

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. Frontiers of Information Technology & Electronic Engineering, 18(1), 86-96.

Lijia Chen, Pingping Chen, Zhijian LinIeee Access 8, 75264-75278, 2020

Mashrur Chowdhury, Adel W Sadek, Artificial intelligence applications to critical transportation issues 6 (3), 360-375, 2012

Matjaž Perc, Mahmut Ozer, Janja Hojnik, Palgrave Communications 5 (1), 1-7, 2019

McCarthy, J. (2007). What is artificial intelligence?

Meng Guo Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Nil Goksel, Aras BozkurtHandbook of Research on Learning in the Age of Transhumanism, 224-236, 2019

Nils J Nilsson.Cambridge University Press, 2009. The quest for artificial intelligence.

Peter Svenmarck, Linus Luotsinen, Mattias Nilsson, Johan Schubert, Proceedings of the NATO Big Data and Artificial Intelligence for Military Decision Making Specialists' Meeting, 1-16, 2018

Peter Svenmarck, Linus Luotsinen, Mattias Nilsson, Johan Schubert, Proceedings of the NATO Big Data and Artificial Intelligence for Military Decision Making Specialists' Meeting, 1-16, 2018

Radulov N.1 Department National and International Security, New Bulgarian University, Sofia, Bulgaria

Rajendra AkerkarPHI Learning Pvt. Ltd., 2014. Introduction to Artificial intelligence.

S Bhbosale, V Pujari, Z Multani, Aayushi International Interdisciplinary Research Journal, 227-230, 2020

Swati Goyal, BR Srivastava International Journal of Scientific Study 9 (1), 25-30, 2021

Vishal Dineshkumar Soni, International Engineering Journal For Research & Development 4 (1), 7-7, 2019

Wagner, J. B. (2019). Artificial intelligence in medical imaging. *Radiologic technology*, *90*(5), 489-501.

Wayne Holmes, Maya Bialik, Charles FadelBoston: Center for Curriculum Redesign, 2019.

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. *Materials Horizons*, *2*(2), 140-156.

ANALYSIS OF THE FEASIBILITY OF SMALL MODULAR REACTORS

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Abstract
This paper discusses the technical and economic aspects of a Small Modular Reactor (SMRs). The technologies and the designs available at present times are discussed in the beginning, followed by their overall contribution to electricity generation. The issues regarding investment into SMRs and their manufacturing are considered afterwards. Then a comparison between Large-Scale Reactors (LSRs) and SMRs is done on basis of their initial capital costs, terrestrial footprint and power output. The fuel management, safety, and modularity of SMRs are also analyzed. Additional benefits like load following and cogeneration are also mentioned. Social and political aspects of their development are included at the end.
Keywords: small modular reactors, future nuclear power, clean energy, economic analysis, cogeneration, safe nuclear technology

Introduction
With the increasing population, the demand for electricity and energy is also increasing. Traditional energy sources like coal and crude oil are facing cynical criticism due to the degradation they are causing to the environment. These resources are also depleting rapidly. Hence, the requirement for clean energy is vital in the coming years. In this paper, we attempt to discuss the feasibility of using nuclear power as the main source of electricity for the future. Currently, nuclear power contributes a mere 11% of the total electricity production. A compact nuclear reactor would make nuclear electricity more accessible by bringing the nuclear reactor to every doorstep. All this is possible, once Small Modular Reactors (SMRs) become feasible and widely available. In the current times, large scales nuclear reactors are still not leading the energy production. Large initial investments and the huge amount of residual waste are a major cause of concern. Majority of the public is still scared of a nuclear meltdown. This paper will also discuss whether investment in research on compact nuclear reactors is economically and environmentally viable or not in the current times. Yet, SMRs are still in their initial phase and need further research and investigation to be a leading electricity producer of the future.

Literary Survey
[1] Very few Small Modular Reactors (SMRs) are developed enough to be used for the production of energy on a commercial scale. Countries like Canada, France, India, Argentina, Japan, Brazil, Republic of Korea, China, Russia, USA, and South Africa are developing and researching SMRs technologies. Numerous concepts and design (including Generation IV designs) are available. Light Water Reactors, Liquid Metal Cooled Reactors, and Gas Cooled Reactors are the main prospects. Supercritical Water Reactors are the least supported. The full-scale commercial performance testing is still pending. SMRs are easier to operate and maintain. The operational temperature of the Reactor Pressure Vessels (RPVs) is lower in SMRs than the Large Scale Reactors (LSRs). Consequently, less heat needs dissipation from the reactor and hence passive cooling systems can be used in them.

[2] A variety of SMR designs help in selecting the best possible design for the commercial production of electricity. Working designs that have some level of industrial involvement are: <A>mPower: The reactors work in groups of two or more, which are buried under the ground. The nuclear steam supply and the once-through steam generators are placed inside the RPV. This ensures safety during a meltdown. <B>NuScale: The steam generator is a helically shaped coil, is placed inside the RPV. The steam leaves from the top and the feedwater comes into the reactor from the bottom. The difference in the density drives the steam upwards. No coolant pumps are present. This removes the mechanical and electrical components of cooling systems. During a meltdown, the SMR is submerged into a water pool. <C> Westinghouse: This SMR borrows many design aspects from the AP-1000 LSR, also by the same company. The core uses the same 89 Robust Fuel Assemblies, available and used worldwide. Most of the coolant components are inside the pressure vessel, making the reactor design modular.

[3] Traditional economics state LSRs are considered more viable compared to SMRs due to the belief in the principle of 'Economy of Scale'. It states the specific capital cost, i.e. currency/MWe of a reactor, decreases with increase in the size of the reactor; as the numerator (currency) increases at a slower rate than the denominator (output). Although, 'Economy of Scale' principle can only be applied if the reactors are similar in design and just differ in size, as it had been the case in the past. This is no longer correct as modern SMRs have distinct designs and characteristics, meaning that the 'Economy of Scale' cannot be applied to the economic analysis of LSR vs SMR. Moreover, the investments in SMRs are also modular due to their small size and short construction time. In particular, SMRs are more flexible and adaptable to the market conditions where the capacity of the plant can be instantaneously decreased or increased according to the demand i.e. market matching. On the contrary, LSRs require a huge amount of time to be manufactured due to which the investment can only be made on the bases of long-term planning and predictions which can be risky.

[4] Reutler and Lohnert (1984), stated that a power plant composed of multiple small modular reactors should be competitive enough to produce electricity on a commercial scale. Taking the example of High-Temperature Gas-Cooled Reactor Pebble-Bed Module (HTR-PM) vs the Pressurized Water Reactor (PWR), it is observed that factor of differentiation between them is the cost of the RPV. This cost gap is almost negligible because the RPV contributes only 2% of the total capital costs of the PWR power plants. Large Nuclear Reactor (LNR) produces 1000 MWs – 1200 MWs whereas, SMRs produce around 250 MWs – 300 MWs. Thus, the future of their construction and maintenance is on their 'economics of scale' (costs which are dependent on the scale of output) and 'economics of experience' (reduction in costs of manufacturing with the help of knowledge gained). In the case of HTR-PM, it was found that 2 x 250 MW is a better option than one 458 MW plant. Even though the 2 x 250 MW costs 5% more than the 458 MW, the technical certainties of the 2 x 250 MW against the 458 MW, making it the economic winner.

[5] A Monte Carlo evaluation was done on the economics of a medium scale reactor, a combined cycle gas turbine and a coal power plant using probabilistic analysis. The results show that coal tax plays a major role in deciding the feasibility of SMRs. If the current taxes levied on coal remain the same, SMRs will not have a considerable impact in the coming years. But if the governments are vigilant enough and increase the coal tax, it could jumpstart the SMR economy. By creating a portfolio of designs and trying to reach higher flexibility we can minimize risks and increase revenue for the investors. Costs which are lost to make a nuclear reactor smaller are recovered by making it modular, i.e. parts manufactured on an industrial scale and assembled on site.

[6] SMRs due to their simpler designs are much safer compared to LSRs. SMRs can incorporate passive systems based on natural laws, like gravity and natural circulation for, decay heat removal and emergency core cooling. Some SMRs like CAREM-25 of Argentina, NuScale of the USA and ABV-6M of Russia use natural circulation for cooling in normal operation mode and avoid coolant circulation pumps. Natural circulation system uses the difference in density between single liquid coming downward in the annulus of the reactor vessel and the two-phase mixture going upward in the core. This is made possible by increasing the volume of water in the vessel and by adding chimney above a shorter core, as most of the SMRs have a shorter core, the required buoyant force can be easily established. Other passive systems include the Nuclear Steam Supply System (NSSS) and Engineered Safety Features (ESF). The NSSS module removes external coolant loop piping, which eliminates large-break loss-of-coolant accident. The passive ESFs eliminates the need for external power under accident conditions.

[7] It is impossible to set up LSRs in countries with geographical constraints and weak economy due to natural barriers and insufficient technical infrastructure. These regions don't have proper grid capacity. Thus, SMRs are the perfect solution which can be tailored to tackle a particular set of problems which cannot be addressed by LSRs. Their small size makes them much suitable for smaller grids with low capacity, for areas with low population and low energy demand. Due to their modularity, they can be manufactured completely in the factory and can be delivered and installed module by module. This is simpler especially in cases where onsite manufacturing is impossible due to geographic barriers.

[8] Renewable energy power plants like wind and solar are highly variable in energy production. This is a major problem for electricity grid managers. Incorporating SMRs along with solar and wind can solve the problem of the fluctuating energy production in the power plants. This will ensure constant electricity supply to the grid and saving fuel and costs as well. This is achieved by using multi-module SMRs which increase their electric production when less electricity is generated by the solar and wind power plants. LSRs can also be used but they offer no fuel or cost saving due to the substantially fixed nature of input raw material. This form of load following is different from the one used in developed nations, like Germany and France, where the time of increase in demand is known. This is better for developing countries, where solar and wind are increasing rapidly, and where timings of the increase in demand for energy are still unknown.

[9] SMRs are extremely suitable for setting up cogeneration plants. <A> Biorefinery mainly produces biofuel out of biomass, electrical energy, and thermal energy. Biofuel includes biodiesel, ethanol, biogas, and bio-jet fuel. If SMRs are set up along with a biorefinery then, 50% of the energy produced by the SMRs should be directed towards the biorefinery, when it is working in load following mode. <B> Water desalination can be done by using the membrane method or the thermal method. Membrane method mainly uses electricity, whereas thermal energy is used in the thermal method. The start time of a desalination plant is not fixed. The plant can start and stop at any moment and keep working properly. Load following SMRs can be integrated with this cogeneration plant. <C> Another possible cogeneration technique is to heat a group of buildings or a district in a subpolar or polar region using numerous SMRs placed at proper locations.

[10] Lower costs, higher safety, and less waste are the main reasons why SMRs are advocated so strongly by the pro-nuclear public. But it is seen, the available SMR designs are not perfect. Practical designs have to make choices in between the three and trade one for the other. Lower cost and higher safety never seem to fit together into a single design. Example, the HTR-PM operates at

higher temperatures because it uses small pebbles (balls) with the unique coating as its fuel. This provides higher security and safety but costs are increased due to the requirement to manufacture the special fuel. Safety is also sacrificed when fast neutron reactors are used, which generate less quantity of radioactive waste. Another factor opposing SMRs is the proliferation of nuclear weapons by the different nations developing SMRs. Almost all the general public is still afraid of nuclear technology due to the horrors of WW2 and the various nuclear meltdowns over the years.

Findings

Due to the small size, modularity and simplicity SMRs show a diversity of unique advantages which cannot be replicated in LSRs. SMRs provide increased safety. The risks of a reactor meltdown are also reduced while using lower capacity reactors. They are cleaner than the LSRs as SMRs are more fuel efficient and produce less radioactive waste. Their operability is not limited by geography or location. Few SMRs are commercially active and are still to produce electricity on an industrial scale. A large variety of SMR designs provide options to the investors and governments. SMRs can be incorporated into cogeneration plants. These can be highly efficient and provide additional services. Remote countries in demand of a clean and stable energy source, which are unable to set up LSRs can benefit from SMRs. Their small size makes them much suitable for smaller grids. Due to their modularity, they can be factory made and shipped to these regions. In terms of economic, they still need to reduce their manufacturing costs as compared to LSRs for the same amount of electricity output.

Conclusion

Individuals advocating for development and deployment of SMRs on a large scale suggest this new alternative form of nuclear power can rectify all major problems that we are facing with nuclear power today. Still, there are significant technical and social gaps to be covered. Research should be focused on better passive cooling systems for RPVs. Traditional nuclear fuel rods need to be replaced. 96% of the traditions fuel gets wasted and is stored underground and not used again. More efficient fuel layouts and materials are coming up, but more research is needed before their commercialization. Modularization of RPV and reactor simplification is required. It is important to make people aware of nuclear energy so that the people in power can make educated decisions; even if they are against this technology. Concerned authorities should invest in SMR development as it goes one step further in securing the future of humankind. By 2050, 11 billion humans will need electricity supply and clean water, Small Modular Reactors might just be the answer.

References

Black, G., Black, M. A. T., Solan, D., & Shropshire, D. (2015). Carbon-free energy development and the role of small modular reactors: A review and decision framework for deployment in developing countries. *Renewable and Sustainable Energy Reviews*, *43*, 83-94.

Carelli, M. D., Garrone, P., Locatelli, G., Mancini, M., Mycoff, C., Trucco, P., &Ricotti, M. E. (2010). Economic features of integral, modular, small-to-medium size reactors. Progress in Nuclear Energy, 52(4), 403-414.

Kessides, I. N., &Kuznetsov, V. (2012). Small modular reactors for enhancing energy security in developing countries. Sustainability, 4(8), 1806-1832

Liu, Z., & Fan, J. (2014). Technology readiness assessment of small modular reactor (SMR) designs. *Progress in Nuclear Energy*, *70*, 20-28.

Locatelli, G., & Mancini, M. (2010). Small-medium sized nuclear coal and gas power plant: A probabilistic analysis of their financial performances and influence of CO2 cost. *Energy Policy*, *38*(10), 6360-6374.

Locatelli, G., & Mancini, M. (2010). Small-medium sized nuclear coal and gas power plant: A probabilistic analysis of their financial performances and influence of CO2 cost. *Energy Policy*, *38*(10), 6360-6374.

Locatelli, G., Boarin, S., Pellegrino, F., &Ricotti, M. E. (2015). Load following with Small Modular Reactors (SMR): A real options analysis. *Energy*, *80*, 41-54.

Ramana, M. V., & Mian, Z. (2014). One size doesn't fit all: Social priorities and technical conflicts for small modular reactors. *Energy Research & Social Science*, *2*, 115-124.

Rowinski, M. K., White, T. J., & Zhao, J. (2015). Small and medium-sized reactors (SMR): A review of the technology. *Renewable and Sustainable Energy Reviews*, *44*, 643-656.

Zhang, Z., & Sun, Y. (2007). The economic potential of modular reactor nuclear power plants based on the Chinese HTR-PM project. *Nuclear Engineering and Design*, *237*(23), 2265-2274.

ARTIFICIAL INTELLIGENCE

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Introduction

This Article focuses on the basic insight towards the world of Artificial Intelligence – its growth, history and applications. The findings published here may comprise of debatable concepts even today. The article aims towards understanding the capabilities of AI, its pros and cons along with various applications in multiple fields of occupations and research across the globe. Moreover, it highlights some of the features, capabilities with potential to improve and shortcomings of AI that have been overlooked in the recent years.

What is AI?

[1] Artificial Intelligence revolves around the concept of building highly intelligent machines, capable of performing tasks which utilize human understanding and decision making. However, the scope and limitations of this concept may exceed the scope of biological observations.[2] Artificial Intelligence focuses on the learning aspect of machines. That is, the activities and decisions of humans can be recreated with great precision and accuracy through patterns and observations.

History of AI

[3] The foundation of AI was based upon looking into the capabilities of machines and understanding their limits. However, as exploration continued, it was found that the opportunities were endless and that such complex machine learning gave way to greater opportunities. Thus, further research was put in towards Artificial Intelligence.[4] During the initial stages of software development, a software engineer, Alan Turing created a testing mechanism to detect and classify software as 'intelligent' via the 'Turing Test'. The testing involved criteria wherein mimicry of human behavior was observed in various machines and hence, were termed 'intelligent' accordingly. This paved the way towards the development and research of Artificially Intelligent software. Initially, the understanding of AI slightly varied from the now globally accepted concept. A program or code was considered Artificially Intelligence provided it had the means to give users the information they needed. However, further development and research in the field has brought about a new meaning wherein AI involves providing users asked information and learn from repeated/unique actions on its own over time.

Growth of AI

[5] The growth of Artificial Intelligence in the industry solely depends upon its growth in the economic sector. Moreover, further research and development can only be made into AI if said machines are capable of contributing a significant amount to the economic section and therefore attaining profit. Thus, it is noticeable that tech corporations, electronic retailers invest a great deal towards Artificially Intelligent devices – capable of providing users required information and services at their convenience.[6] Although AI has reached great heights and has produced significant results. With further insight into attaining greater means of recreating human behavior and decision-making along with computational capabilities exceeding that of humans, AI can reach even greater heights. Moreover, investments and development in the field of Artificial Intelligence and applied fields, multiple job opportunities, research fields and innovations are yet to come in the near future.

Artificial Intelligence in Healthcare Appliances

[7] The management of various medicines, their abundance, doses and requirements is an extremely difficult and time-consuming process. Thus, AI is utilized to great extents in the medical field to keep track of large-scale data and increase efficiency in diagnosing ailments and procuring the appropriate ointments. [8] Ailments and their treatment often differ greatly in the minds of different doctors and can thus raise questions regarding the availability of different medicines and thus, the most efficient approach towards curing it. AI allows storage and manipulation of data so as to ensure that resources are never wasted. [9] The benefit AI provides in the medical field is that it can be made fast and efficient by making it a deliberately dedicated software for medicine. That is, the software is permitted to store data only for diseases, medicines and availability of ingredients. This prevents confusion and set-backs often faced by humans due to interferences by concepts learnt in different fields and their logical applications.

Artificial Intelligence in Manufacturing and Production

[10] AI has been setup in manufacturing industries and factories to facilitate periodic inspections, fault detection and maintenance. Further initiatives have been taken in the manufacturing department to enable AI machines to understand and thus make the traditional human method of approach towards manufacturing with machine level decision making abilities. [11] AI has significantly contributed to the manufacturing department seeing that the technology enables machines to use human knowledge with machine level precision, environmental information and make high-quality, cost-efficient products for consumption. [12] AI is not directly implemented into manufacturing industries once available. Instead, it is setup with equipment to ensure that it is dedicated towards the allotted task and thus, completes its tasks efficiently. AI in manufacturing industries is augmented with larger databases and state-of-the-art management infrastructure and technology. Moreover, AI can also be used to build initial prototypes to which, further upgrades and augmentations are added as deemed fit.

Artificial Intelligence in Security and Surveillance

[13] Implementation of AI in security and surveillance aspects can be of great deal because of the benefits AI provides in terms of data management and correlation. Criminology involves attaining clues and correlating them with data that is observed and inferred on different locations and at different timings. This time consuming and confusing process can be solved quickly with the help AI in the most efficient ways possible, that is, storage of required data, assistance in criminal analysis and independent management of separate databases corresponding to different cases. [14] Although AI seems to be a good alternative from human resource for security and surveillance due to the absence of various limitations such as exhaustion and distractions, it could be the very reason of compromise for others' security. Misuse of AI, if any, could lead to an invasion of privacy of any individual. Future development in AI could potentially make simple AI machines able to infiltrate or compromise information with little investment due to availability of advanced but highly vulnerable AI implemented devices. [15] To protect one's cyberspace, a person or organization attacks the other. Here, implementation of AI to combat invasion of cybercrime can be extremely beneficial as it decreases the number of stakeholders required to combat a security breach. Updating a software to keep check of all sorts of malware and also enabling it to approach issues with a human mindset can allow AI in security departments to come up with new and unique solutions too. This allows AI to surpass any human shortcomings and hence, locate threats and act upon it immediately.

AI in Education

[16] Artificial Intelligence utilizes various means of calibrations and scales to measure human proficiency in learning, understanding and resource gathering. This allows machines to be implemented in the education sector – capable of imitating human means of teaching with superior data management and efficient teaching methods.[17] The progress of the education department has moved beyond the traditional memorizing of concepts and formulae towards understanding the value of significant competencies such as critical thinking, metacognition and collaborative skills. This provides AI the golden opportunity to help develop in recreation/imitation of human competencies and thus, can be an asset for the education sector via utilization by means of E-learning, catalogues, libraries, databases and much more.[18] Implementation of Artificial Intelligence can be highly beneficial especially for software programming/ coding related engineering. This is so, because these machines can be used to learn syntax, keywords and other functions from various languages (XML, C++, DHTML, MATLAB, etc) and enable rookie coders to perform their programming with ease as they can seek assistance for their codes when in need. Furthermore, this AI could be upgraded beyond current capabilities, that is, autocorrect mere errors or even form its own means of debugging and program compiling/interpreting.

Advantages of Artificial Intelligence

[19] There are occurrences where moral values, ethics and other factors affect a person's decision making. Here, AI can be used to understand consequences of various choices and factors, thus, allow users to choose the most efficient in decision in debatable instances.[20] AI allows easy and convenient transfer, storage of data, which cannot be replicated among humans. Moreover, the machines to which data is transferred can be configured to recreate human behavior/practices that were recognized and learnt by the former machines. .[21] AI allows easy management of databases in intensive data management related occupations (example: Libraries). Machines can recognize and learn patterns and automatically become capable of categorizing and keeping check of data. Moreover, it can learn to provide suggestions, pre-requisites and other convenient formalities via long-term usage and pattern recognition. [22] AI allows users to dwell deep into understanding and making progress in content/document analysis. This is highly beneficial in educational and research related departments wherein Natural Language Processing can be utilized to distinguish common and informal dialects and language with formally accepted means of communication for research/academic publishing. This also allows AI to interpret common phrases and metaphors from common speech, thus, learning more about human cognition and behavior.[23]AI has proven to be highly beneficial in E-learning. Programs which can recognize cognitive and competence related development adapt to users' progress in E-learning and can provide the required material to individual students after analyzing their development. Furthermore, this allows the AI to learn more about student progress, analyze their academic development and is able to plot the academic progression throughout their study session.

Disadvantages of Artificial Intelligence

[24] Although AI has its great benefits and provides convenience for rookies, employers and other occupations, further development and progress in this department may lead to job substitution by AI, that is, people may lose their jobs because these machines are able to perform the same task more efficiently. Thus, drastically affecting the human resource availability. [25] Since AI has the

capability of recreating human behavior and understanding, it is extremely crucial to ensure that AI does not fall into the wrong hands. The reach that AI has in today's world can be misused very easily to create mishaps, potentially leading to problems that could greatly impact the general public. In addition to this, it could also be used to infiltrate corporations and facilities to attain information that may lead to potential compromise of multiple private firms or even the safety of a country.[26] Although AI makes tasks easy and convenient, the programming and effort done to create specific task-based AI involves a lot of complex procedures, pattern-based programming and recognition. This requires a great amount of time, resources and investment. However, if the program/product comprises of setbacks, limitations or defects, it could lead to loss of funds and affect the economic functioning of firms and facilities. [27] Artificial Intelligence comes in many kinds of programs and applications with varied applications in different fields. However, the use of AI in the programming of social media apps and related features has made AI conducive to social media addiction. The youth of today spends the vast majority of their times on social media and video games. This affects the social and creative aspects, thus, affecting their overall viability as an asset/human resource in the future. Moreover, the reliance on Artificially Intelligence machines has proven to make people lazy and unwilling to take efforts. This drastically affects the quality of human resource for the multiple sectors in development for all the countries across the globe, thus, also affecting the potential that AI can achieve for the coming future. [28]One of the biggest vulnerabilities of AI is the requirement of active connections – a source which allows the program to continuously process data and learn new things. The absence of an information pool for AI to treat as source along with possible threats such as cyber-attacks via third party software (hacking, infiltrating) may render AI useless in certain scenarios. This leads to greater investment to ensure that cyber-attacks do not compromise important data. Ultimately, making the development process very expensive.

Conclusion

The number of opportunities across the globe at present for implementation/application of AI are at an all-time high and will increase exponentially. From simple web-browser search engines to complex part manufacturing machines, AI has undoubtedly provided convenience in performing tasks in the vast spectrum of jobs, occupation and research fields across the globe. Although AI is extremely reliant as is in the present generation, further investment, research and developments in the field of Artificial Intelligence could potentially improve upon its shortcomings and thus, work on matters which have been overlooked. Further allowing the rise of new occupations and research.

Overall, it is blatant that the applications of AI discussed here contribute barely nothing compared to the vast spectrum of possible opportunities to implement AI in the present generation of technology and electronics. The capabilities of AI to learn patterns, human behavior, cognition and competencies give way to a future wherein the highly advanced human race is accompanied by AI in all walks of life. Albeit, the thought of a future where humans have to put in significantly less effort to achieve their goals may be intriguing, it also raises concerns regarding employment, human resource and its quality. Further investigation may occur to ensure that a delicate balance is attained in this matter, possibly through the assistance of AI.

References

Aghion, P., Antonin, C., & Bunel, S. (2019). Artificial intelligence, growth and employment: The role of policy. *Economie et Statistique*, *510*(1), 149-164.

Allen, G., & Chan, T. (2017). *Artificial intelligence and national security*. Cambridge, MA: Belfer Center for Science and International Affairs.

Benbow, T. (2012). How does the development of Artificial Intelligence and/or Intelligent Software Agents' disadvantage or benefit society in today's world?.

Benko, A., & Lányi, C. S. (2009). History of artificial intelligence. In *Encyclopedia of Information Science and Technology, Second Edition* (pp. 1759-1762). IGI Global.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Devedžić, V. (2004). Web intelligence and artificial intelligence in education. *Educational technology & society*, *7*(4), 29-39.

Dick, S. (2019). Artificial intelligence.

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education. *Boston: Center for Curriculum Redesign*.

Holzinger, A., Langs, G., Denk, H., Zatloukal, K., & Müller, H. (2019). Causability and explainability of artificial intelligence in medicine. *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery*, *9*(4), e1312.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Kose, U., Arslan, A., & Campus, A. K. (2015). E-learning experience with artificial intelligence supported software: An international application on English language courses. *GLOKALde*, *1*(3), 61-75.

Lee, L. W., Dabirian, A., McCarthy, I. P., & Kietzmann, J. (2020). Making sense of text: artificial intelligence-enabled content analysis. *European Journal of Marketing*.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

McCarthy, J. (2007). What is artificial intelligence?.

Minsky, M., & Papert, S. A. (1972). Artificial intelligence progress report.

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In *Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi*.

Radulov, N. (2019). Artificial intelligence and security. Security 4.0. *Security & Future*, *3*(1), 3-5.

Ramesh, A. N., Kambhampati, C., Monson, J. R., & Drew, P. J. (2004). Artificial intelligence in medicine. *Annals of the Royal College of Surgeons of England*, *86*(5), 334.

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education*, *26*(2), 582-599.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Szolovits, P. (Ed.). (2019). *Artificial intelligence in medicine*. Routledge.

Tao, B., Díaz, V., & Guerra, Y. (2019). Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher. *Arctic Journal*, *72*(12), 30-50.

Wan, J., Li, X., Dai, H. N., Kusiak, A., Martínez-García, M., & Li, D. (2020). Artificial-intelligence-driven customized manufacturing factory: key technologies, applications, and challenges. *Proceedings of the IEEE*, *109*(4), 377-398.

Wirkuttis, N., & Klein, H. (2017). Artificial intelligence in cybersecurity. *Cyber, Intelligence, and Security*, *1*(1), 103-119.

CYBER CRIME AND NEED OF CYBER CAMANDOS

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Abstract

In the world of today where we are too much depended on computer and more specifically Internet, we are not paying head to the approaching disaster i.e. cyber-crime. Although the first cyber attack took place in 1834 in France but, still we are not paying head to it the most recent one among them was wanna cry. Cyber crime has introduced a total new form of criminals, what make these criminals more dangerous is the very fact that they need not to be physically strong or carry any weapons like traditional criminals. They can have your personal data on their finger finger tips. The good news is that now the government has started recognizing the need of cyber commandos, these cyber commandos are sometimes also referred as ethical hackers. Their main work is to hack the government server with permission from government so as to find the loop hole; if any and sometimes they are also used for offensive attack but still the step taken in this direction is not sufficient and there is lot to be done.

Keywords: cyber crime, cyber commandos, ethical hackers, cyber terrorism, cyber attack

Introduction

The world today relies heavily on the need of internet. The introduction of smartphone, desktop, laptop and other devices has increased its value in our day to day life. In present day we can't imagine our world without internet; but this internet has given birth to a total new world called cyber world. This world is both a boon and ban for our society. On one side where it makes our life easy through cashless transaction, simulation, e-governance and many other things; at the same time, it has given birth to the whole new breed of criminal often referred as hacker's or cyber-criminal. Wanna cry, not petya are some of the cyber-attack which resulted in huge loss of money. As a matter of concern cyber-crime is now not limited to economic or money loss now it has moved one step further now it is resulting in death of young children blue whale game is one of those things. Many times, it is misinterpreted that cyber world is for young generation and they have to deal with it the older generation is immune to it and they can't fall into it; as a matter of fact, it is not true. Hackers are using this mentality against the old generation. As per the survey conducted by site named engineering and technology 75% of people aging more than 45 accepted that they have been targeted by spam e-mail; 6% excepted that they have fallen in trap of it; about a quarter of people aging more than 75 excepted that they feel vulnerable although they have excepted that it has made their life easy. All this problem for sure hints towards a whole new dimension of war the "cyber war". Imagine a Scenario where government of a country is not left with any other choice than war. In this case if they go for full fledge war and even if they win war they will suffer huge loss of life, money, resources and inflammation. On other hand if the same country goes for cyber war than the not just save their resources and people but also gains money, wealth and depletion of enemy country economy without wasting a single bullet. INDIA is not an exception to this; INDIA can may face a cyber war or cyber threat to tackle with such situation we need cyber commandos who can not only tackle such situation but also counter attack if needed. Clearly, it's time for fourth generation war where battle will be fought in cyber world and the fate of the world will be decided there. Gone are those days when battle where fought on the ground now is the time of cyber world we need cyber commandos and ethical hackers to save ourselves.

Literary survey

Taylor [1] has stressed the importance of discovering the different types of cybercrime taking place in today's world i.e. Digital crime and digital terrorism. With the increase in terrorist act committed using computer technology. He has addressed the problem of hacker's and other other type of digital criminal. He also discussed about the different strategies and legal option to tackle them. He emphasized on the need to address the problem of cyber terrorism and information warfare. D. Halder [2] believes that majority of the cybercrime committed against women is due is due to the absence of proper legislation. Art 17 of international covenant on civil and political rights (1996) which prohibits "arbitrary or unlawful interference with privacy, family, home or correspondence or unlawful attacks on honor or reputation". Section 509 of IPC prohibit words, gesture or act intended to insult the modesty of women but this law is not able to protect effectively the rights of women in cyber space. Nykodym [3] considers that the cyber-crime is increasing at a very high speed and the progress made in this direction to tackle cyber-crime is not sufficient which has created a large gap in legislative compatibility across international the globe. The very idea that an individual committing crime in cyber space may not fit in a certain classified branch of criminals but evidence suggest that certain distinguish characteristics cyber criminals may exist in cyber space. The most common among all is the cyber-criminal inside their own wall. Broadhurst [4] explores the nature of groups engaged in cybercrime, he outlines the definition and scope of cybercrime or cyber offenders. The paper gave example of known cases and motivation of typical offenders, which includes state offenders. The cybercrime committed by state actor, appears to acquire leadership, structure and specialization. By contrast, protest activity tends to be less organized with weak chain of command. Britz [5] has stressed on the creation of unparallel opportunities for commerce, research, education, entertainment and public discourses. The increase on reliance on digital technology and communication. Many undergraduate students rely on internet for source of knowledge but, unfortunately the quality and and authenticity of material available on internet often comes under question. A person sitting in Madagascar can easily stalk a girl sitting thousands of kilometers away or he can share the blue print of weapon of mass destruction while enjoying all the comfort. Mc Cusker [6] has stressed on law enforcement prospective to control traditionally organized group in cyber space, however it is not clear wether or not any any such group exist or not. One thing which is for sure is that it is organized when it is targeted at a particular person or group of people. The critical question questioniewether the introduction of cyber crime has facilitated traditional crime or it has created a total new dimension. He pointed out that there is very less state of apoplexy within law enforcement agencies . He believed that there is very thin line between organized cyber criminals and criminals who simply operate in online space. Lewis [7] stressed on the role of mass media in extension of information through entertainment. He emphasized more on fraud, organized crime and terrorism; which lead him to think about the unwillingness of establishment to tackle it and the hierocracy of businesspeople or politician. The presence of lobbyist media and NGO increases the liable risk involved in cyber space. Business done today through technology i.e. cashless transaction and others are technologically vulnerable, and these affected business people are neglected by traditional media. David wall [8] stressed on the slow response of criminologist. He pointed out that in today's world it is not difficult for a 16-year-old to become the world's largest threat after Adolf hitler and that too without leaving his comfort chair. How we respond to them remain unanswered. He stressed on the on the importance to give rise to the cyber-crime justice system. Bhatt [9] stressed on the origin of cybercrime to the growing

dependence on computers in modern life. While it has bought remarkable change in our life subsequently it become popular as cyber world. It is surrounded by number of things in which crime is the most serious threat. Harcourt [10] has stressed on the major analysis of emerging cultural characteristics of women's activities on the internet across the globe, it brings together communication expert, development worker's and media analyst and women movement. It maps both social, economic and political biases in which the culture of cyber space is imbedded as well it's revolutionary potential explores women's knowledge. It rethinks the very idea of culture by looking at the link and discontinues between the local and global cyber culture.

Findings

Today different type of cyber crime has started taking place like cyber stalking, cyber terrorism, data theft and many others. Women's are the easiest targets in this type of case this is due to lack of legislation. As per article published in India Times dated July 25, 2017 banks lost ▢ 88553 per hour due to cyber crime in last 3 year. Traditionally armed forces of any country consist of three components i.e. Army, Navy and Airforce but now in the changed world a fourth component is added i.e. cyber commandos, both for offensive as well as defensive purpose.

Recommendation and Conclusion

Before writing this research paper I was sure that cyber crime is a big challenge for today's world and the only solution for this crisis is cyber commandos. Now after writing this research paper I can conclude that my assumption was correct. In this field there is huge scope of research and development so as to tackle the cyber criminals.

References

Bhatt, S. C., & Pant, D. (2011). Cyber Crime in India. *International Journal of Advanced Research in Computer Science*, *2*(5).

Britz, M. T. (2009). *Computer Forensics and Cyber Crime: An Introduction, 2/E*. Pearson Education India.

Broadhurst, R., Grabosky, P., Alazab, M., Bouhours, B., & Chon, S. (2014). An analysis of the nature of groups engaged in cyber crime.

Halder, D., Jaishankar, K., & Jaishankar, K. (2012). *Cyber-crime and the victimization of women: laws, rights and regulations*. Hershey, PA: Information Science Reference.

Harcourt, W. (Ed.). (1999). *Women@ Internet: Creating new cultures in cyberspace*. Palgrave Macmillan.

Levi, M. (2006). The media construction of financial white-collar crimes. *British Journal of Criminology*, *46*(6), 1037-1057.

McCusker, R. (2006). Transnational organised cyber crime: distinguishing threat from reality. *Crime, law and social change*, *46*(4-5), 257-273.

Nykodym, N., Taylor, R., & Vilela, J. (2005). Criminal profiling and insider cyber crime. *Computer Law & Security Review*, *21*(5), 408-414.

Taylor, R. W., Fritsch, E. J., &Liederbach, J. (2014). *Digital crime and digital terrorism*. Prentice Hall Press.

Wall, D. (Ed.). (2003). *Crime and the Internet*. Routledge.

ARTIFICIAL INTELLIGENCE, WHAT IS IT?

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Introduction

Artificial Intelligence has grown to be immensely popular in today's world.AI is a study of how human brain think, learn, decide, and work, when it tries to solve problems. Aim of Artificial Intelligence is to improve computer functions which are connected to human knowledge such as reasoning,learning,problem-solving, belief and linguistic intelligence.

What is Artificial Intelligence?

[1] Artificial Intelligence refers to the science and engineering used to make smart systems, in computer science domain which helping in technological advancements. It is the replica of how the human intelligence works but it does not deliver the methods that are biologically observable.[2] Artificial Intelligence can be thought as a study which deals with the analytical and algorithmic aspect of problems, using the computational models. [3] Artificial Intelligence is a field within computer science which tries to set upenhanced intelligence into various computer systems.

History of Artificial Intelligence?

[4] Artificial Intelligence discovered because of the historic philosophy, imaginations, and demonstrations by some of the leading scientists, researchers of old times. Early inventions were related to the fields like electronics, engineering, mechanics, and many more had severe impact on AI (Artificial Intelligence). Demonstrative Programs were made in various domains like understanding the language, memory association, comprehensive systems, etc. In recent century, the tech industry has been able to build and implement AI based programs in real life problems. Nowadays, we have a practical demonstration of AI in different fields, which once existed as a theoretical possibility.[5] There is a controversy throughout the history of Artificial Intelligence over whether intelligence could be shown by the computer systems. In this generation, modern logic was involved in the evolution of digital computers, that is how we were able to enter the whole concept of AI. [6] Artificial Intelligence was first reported in 1950s. Due to certain limitations at that time it was prevented widespread acceptance and application to medicine. In the early 2000s, many of these limitations were overcome by the advent of Deep Learning. AI systems were able to analyse complex algorithms and self-learning, now AI could be applied in clinical practicethrough risk assessment models, improving diagnostic accuracy and workflow efficiency. DL (Deep Learning)was an important advancement in Artificial Intelligence. AsML (Machine Learning), uses a set number of traits and requires human input, Deep Learning can be trained to classify data on its own. Convolutional neural network (CNN) is a type of Deep Learning algorithm whichwhen applied to image processing that simulates the behaviour of interconnected neurons of the human brain. Multiple Layers of CNN are used to analyse an input image to recognize patterns and create specific filters. Some famous CNN algorithms which are now available are Le-NET, AlexNet, VGG, GoogLeNet, and ResNet.

Growth of Artificial Intelligence?

[7] Molecular biology and evolutionary theory explains us that all the compelling features of biological agents like intelligence, all these have their roots into Darwinian evolution with some major refinements. When we talk about the AI research community, people think that evolutionary processes are not capable of creating machine intelligence. In the past decade, problem solving performance of algorithms has been advanced to a much larger extent. Algorithms can now even supply competitive results in fields of science and engineering as compared to human intelligence. [8] In the last 25 years, Artificial Intelligence achieved significant growth in the field of education. Growth of Artificial Intelligence was possible because of structured approach of development specifically for education sector. Major focus on general classroom activities, collars with various teachers and taking their suggestions, and diversifying required technologies according to the domains. It was necessary for us to embed available technologies within student's daily life, which supports their practices, goals and communities and keep themselves connected.

AI in Healthcare Appliances

[9] Artificial Intelligence is considered a well-known field in computer science and its capable of enhancing human life in many areas. AI can prevent, detect, diagnose, and even treat disease. Artificial intelligence is extensively used in the treatment of severe diseases like cancer, neurology, cardiology, and diabetes. AI is capable of spotting problems and life threats to patients due to high accuracy and speed. In current scenarios, machine learning which is a subset of artificial intelligence can save lives of many patients. [10] Artificial Intelligence with its cognitive abilities has proved itself as a powerful tool which helps with various analysis techniques to the existing healthcare services. Many medical areas like cancer, neurology and cardiology take artificial intelligence as an assisting instrument after the progressive development. Machine learning and deep learning which are the subsets of artificial intelligence handle structured healthcare data and unstructured datasets managed by Natural Language Processing, etc. [11] Recently researchers of Human-computer interaction studied various applications of AI and proposed various principals for a safe and reliable interaction experience. These AI systems can be further improved by increasing the number of collaborations with various medical departments and organizations. Healthcare Appliances embedded with Artificial Intelligence can perform as good as human doctors in terms of medical image data analysis.

AI in Manufacturing and Production

[12] With the rapid development in the technologies in this generation of 'Internet and AI' triggered a profound change in the existing models, means and the whole ecosystem of manufacturing industry. These days intelligent manufacturing is encouraged by integrating Artificial Intelligence with information and communication technology, manufacturing, and other related domains. For any nation manufacturing industry is the major source of national economy, security, and development. [13] In the recent years, Artificial Intelligence has become a crucial thing for accelerating the development of intelligent industrial manufacturing.Advanced concepts of artificial intelligence like deep neural networks and machine learning are used these days to support diagnostics and predictive maintenance of the entire process. AI is considered as a critical technology which can lead to further evolution of industrial manufacturing. There are three major aspects of production monitoring like fault diagnosis, useful life prediction, and quality inspection where artificial intelligence is

applicable.[14] Artificial Intelligence is having major influence on manufacturing and production processes. Multiple Researches are going on all around the globe due to which we were able to see tremendous growth in artificial intelligence in recent years. Most of it focused majorly on the varieties of AI technologies, and less on pre-requisites for adoption of AI at corporate level. That is the reason for the consistent struggles which many companies still face while implementingartificial intelligence in their production. When it comes to the implementation of AI in production factors like digital skills, company size, and R&D intensity plays a crucial role.

AI in Security and Surveillance

[15] When it comes to artificial intelligence in security and surveillance, China is one of the first country in this domain due to their vision of applying AI technologies to build an ever-growing and trustworthy surveillance state. They created a novel model of network authoritarianism. Xinjiang a western part of China can be considered as a real-life experiment - in this area individual freedom, liberty, and security is not there. It is being replaced by the state surveillance system. Facial recognition software is considered as an essential technology in Mongolia for management of prisoners in high security prisons. Chinese company Sense Time specializes in AI and Face Recognition domain and they are striving to achieve innovation supremacy. [16] The learning approach that we human beings use to obtain knowledge is imitated by Deep Learning which is a subset of artificial intelligence. Previously, human supervision was neededwith all surveillance systems but now with advancements we have seenCCTV (closed circuit television) based theft detection along with tracking of various objects. Image processing is used to detect theft and motion, without using motion sensors. Major emphasis on object detection and real-time tracking and analysis of every action. [17] Currently, Artificial intelligence is getting its pace in the industrial builds. AI technique used in cyber-attacks seems to be quite difficult, due to its self-learning capabilities AI is a major problem to the cyber world. Most of the time, AI enabled cyber-attacks are performed with the help of advanced malware which consist of advanced invasion techniques to crack the security of the system.

AI in Education

[18] Association for Computing Machinery (ACM), International Society for Computing have codes of ethics that can be used for the development of Artificial Intelligence Systems for education. It can be also applied towards the development of various computer systems in general but AI systems for education is a specific application of it. We need to understand that AI in education can lead us to potential for harm which cannot be ignored, so we need to use compassionate and wise principles during the implementation. [19] The major concern for Artificial Intelligence in education is that there is an absence of sociological thinking within the field itself because of many external and structural pressures on education systems. Let us take an example, if AI systems for personalised learning is introduced into a sector of education where there is lack of resources and qualified teachers, there is a possibility of exploitation of the provided technology. Apart from these concerns, AI has its own benefits that are self-reinforcing: It will reduce teachers' workload and this will increase the recruitment rate. [20] By Implementing Artificial Intelligence, Educational technologist are figuring out ways to create convenient teaching tools that consists of ideas of more encouraging environments that can offer instructional approaches, various representation of given learning materials and variety of beginner support tools. Recently, educational environments like Udemy,

Coursera, etc are developed that not only stores and uses large amount of data, but also provides the flexibility to the users while learning on their platform. [21] If AI enabled systems are successful, then it will also lead to the most significant social challenge that AI in general has already brought - the consistent replacement of jobs and occupations with brilliant algorithms and robots. For implementation of Artificial Intelligence in education has been the subject of academic research for more than 30 years. To promote the development of convenient learning environment and various other educational tools that are personalised, flexible, effective, and easy to use.

Advantages of Artificial Intelligence

[22] Artificial Intelligence provides every learner their own personalised learning experience, teachers are provided with their own AI teaching assistant, consistent support to keep learning on track and intelligent support for collaborative learning. [23] Artificial Intelligence provide us with the advantages reliability and cost-effectiveness. AI technologies which are currently in use include converting traffic sensors into intelligent agents that can automatically detect accidents and useful in prediction of traffic conditions. [24] Artificial Intelligence can solve stressful and complex problems that humans may not be able to do. AI can complete assigned task much faster than a human being. Error possibilities are reduced to almost null with the help of proper implementation of AI. [25] Artificial Intelligence make decisions based on data rather than emotions. AI enabled machines does not require any sleep, thus increasing productivity of a workspace. Within AI itself it is easier to spread knowledge. [26] Currently, Artificial Intelligence techniques are quite efficient in fashion companies as they deal with different data with many complex connections and dependencies between them. AI used in fashion industry covers a wide scope from design support systems to fashion recommendation systems through intelligent tracking systems, textile quality control, decision making, socialising and fashion e-marketing, etc.

Challenges or Disadvantages of AI

[27] Artificial Intelligence can replace human jobs. If AI is not programmed properly then it can malfunction and do opposite to what it is supposed to do. AI can be misused leading to mass destruction and it may corrupt younger generations. [28] Due to Artificial Intelligence unemployment problems are increased. AI lacks the human touch and requires a lot of time and money. AI can increase the technological dependency of any organization. [29] Artificial Intelligence lacks creativity in responses, malfunctioning can result in failure of AI and lead to various problems. AI is unable to explain the logic and reasoning in certain scenarios. [30] Machines equipped with AI takes a lot of effort and resourcesas equipment's are also expensive. Repairing or customising a pre-existing machine again takes time and money. Unemployment issues are increasing rapidly due to the Artificial Intelligence. Machines are unable to develop a bond with humans which is a critical part of Team Management. [31] Artificial Intelligence is becoming a major reason for loss of jobs in various industries, lacks human touch and emotional intelligence when we consider its application in field of medicine.

Conclusion

In my opinion, Artificial Intelligence is getting everywhere. Its application could be seen in Healthcare Industry, Manufacturing & Production, Fashion Technology, Education, Security and Surveillance, etc. And it continues to evolve as more research is being currently going on Artificial

Intelligence. AI has become the most trending topic of discussion when we talk about Computer Science in general. More companies are focusing on improving AI in their products and systems to overall make a better User Experience (UX). Whether it be Google Assistant or Siri or Alexa or any other virtual assistant all are based on the concept of Artificial Intelligence.AI assistance improved radiologists' performance in distinguishing coronavirus disease 2019 pneumonia from non-coronavirus disease 2019 pneumonia at chest CT (Computed Tomography). Nowadays even video games are using AI, which serves to improve game-player experience rather than machine learning or decision making. AI has a bright future ahead.

References

Aiken, R. M., & Epstein, R. G. (2000). Ethical guidelines for AI in education: Starting a conversation. *International Journal of Artificial Intelligence in Education*, *11*, 163-176.

Amisha, P. M., Pathania, M., & Rathaur, V. K. (2019). Overview of artificial intelligence in medicine. *Journal of family medicine and primary care*, *8*(7), 2328.

Andriessen, J., & Sandberg, J. (1999). Where is education heading and how about AI. International Journal of Artificial Intelligence in Education, 10(2), 130-150.

Arivudainambi, D., KA, V. K., & Visu, P. (2019). Malware traffic classification using principal component analysis and artificial neural network for extreme surveillance. *Computer Communications*, *147*, 50-57.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages of Artificial Intelligence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. Ai Magazine, 26(4), 53-53.

Charniak, E. (1985). *Introduction to artificial intelligence*. Pearson Education India.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Davies, H. C., Eynon, R., & Salveson, C. (2021). The mobilisation of AI in education: A Bourdieusean field analysis. Sociology, 55(3), 539-560.

Ding, H., Gao, R. X., Isaksson, A. J., Landers, R. G., Parisini, T., & Yuan, Y. (2020). State of AI-based monitoring in smart manufacturing and introduction to focused section. *IEEE/ASME Transactions on Mechatronics*, *25*(5), 2143-2154.

Husbands, P., Harvey, I., Cliff, D., & Miller, G. (1997). Artificial evolution: A new path for artificial intelligence? *Brain and cognition*, *34*(1), 130-159.

Kakadiya, R., Lemos, R., Mangalan, S., Pillai, M., & Nikam, S. (2019, June). Ai based automatic robbery/theft detection using smart surveillance in banks. In *2019 3rd International conference on Electronics, Communication and Aerospace Technology (ICECA)* (pp. 201-204). IEEE.

Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine. *Gastrointestinal endoscopy*, *92*(4), 807-812.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3

Kinkel, S., Baumgartner, M., & Cherubini, E. (2021). Prerequisites for the adoption of AI technologies in manufacturing–Evidence from a worldwide sample of manufacturing companies. *Technovation*, 102375.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education.

McCarthy, J. (2007). What is artificial intelligence?

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi.

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Newell, A. (1982). *Intellectual issues in the history of artificial intelligence*. CARNEGIE-MELLON UNIV PITTSBURGH PADEPT OF COMPUTER SCIENCE.

Nilsson, N. J. (2009). *The quest for artificial intelligence*. Cambridge University Press.

Romaniuk, S., & Burgers, T. (2018). How China's AI Technology Exports Are Seeding Surveillance Societies Globally. *The Diplomat*, *18*.

Satpathy, S., Nandan Mohanty, S., Chatterjee, J. M., & Swain, A. (2021). Comprehensive Claims of AI for Healthcare Applications-Coherence Towards COVID-19. In *Applications of Artificial Intelligence in COVID-19* (pp. 3-18). Springer, Singapore.

Spector, L. (2006). Evolution of artificial intelligence. *Artificial Intelligence*, *170*(18), 1251-1253.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Thomassey, S., & Zeng, X. (2018). Introduction: Artificial Intelligence for Fashion Industry in the Big Data Era. In *Artificial intelligence for fashion industry in the big data era* (pp. 1-6). Springer, Singapore.

Wang, D., Maes, P., Ren, X., Shneiderman, B., Shi, Y., & Wang, Q. (2021, May). Designing AI to Work WITH or FOR People? In *Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems* (pp. 1-5).

AUGMENTED REALITY-AN ALTERNATE LIVING

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Abstract

Report based on Augmented Reality strategy, a systematic discipline which can be applied to practical life improving each of the industrial productive life. A brief conception on how augmented reality can be used as your personal assistant. The objective of the concept does not force any selective industrial application but essentially the pursuit of all the applications to gain control, productivity, experience to the highest possibility in the contribution of this technology Augmented reality. Augmented Reality is the technology that has an impeccable impact in all fields, industrial, education, medicine, military, tourism and so forth. The areas of improvement, advantages and detriments, have been taken a shot at in this report. The paper covers the cause and the historical backdrop of Augmented Reality, its working, highlights, and necessities. AR is the key technology solving all the imaginary assumptions, is what one would understand eyeballing this report.

Keywords: augmented reality, NAVICAM, laproscopic surgery, head mounted display

Introduction

Computers have assumed vital part in the advancement of people since the season of its innovation. They have experienced huge progressions ideal from Vacuum tubes to Artificial Intelligence for effective connection with clients. The cooperation between the virtual world and the 'true' Earth is the key point in the innovative advancement of computers. Virtual reality (VR) and Augmented reality (AR) are the parts of concise edition of the virtual world and human condition.

AR in the immediate future would be unified with the abundance of application that makes good things leading to better lives that would be truly vital .Virtual reality puts the users in a 3-Dimensional environment that stimulates authentic-time environment and Augmented reality integrates digital information with the user's environment. Augmented reality is driven by the conception to merge graphics, audio and other sensory factors on the real time environment. Augmented Reality alters one's speculation of a real-world environment. Augmentation largely works on two terms, one of which is hybrid reality and the other- computer mediated reality.

Hybrid Reality refers to the combining of both real and virtual worlds to give us a new vision of the nature. There is a co-existence and interaction of real and virtual environments. This sanctions us to integrate or subtract information from or even lets us shape the reality with compact technology like hand held contrivances. Such contrivances can even include Smartphone or smart watches.

Initial applications of Augmented Reality focused on gaming, until the realization of their uses on a broader area. Augmented Reality has a wide versatility is medical training and surgeries. It additionally is highly utilized in education, business, tourism, manufacture and a lot more fields in today's world.

Literary Survey

[1] In contrast to Virtual Reality, where the user is inside a synthetic environment, Augmented Reality superimposes virtual objects to the environment. AR can be characterized by the following aspects: combining real and synthetic world, interactive and 3D registration. Augmented Reality has a wide range of applications in several fields of today's world like medicine, manufacture, annotation, education, robotics, entertainment, military and many more.

Doctors would be able to use AR to envisage human bodies for study and surgery. It would become easy to draft 3D datasets of a patient, with the use of non-invasive sensors like the MRI, CT and Ultrasound. This will be effective in minimal invasive surgeries and will reduce traumas in surgeries by very small incisions or no incision at all. The problem faces by surgeons today is that the small incisions do not provide a detailed internal view of the patient. The use of AR would help doctors perform critical operations more efficiently.

AR will also be useful in medical training purposes. Novice surgeons would be able to get virtual instructions without the need to divert from the patient for a manual. AR would also help identify organs and assist surgeons at the course of the surgery. There are several researchers working towards developing the application of AR in medical industry. A research group has carried out experiments of using ultrasound sensor to scan the womb of a pregnant woman. The information was processed to generate a 3-D representation of the fetus, at UNC Chapel Hill. The main objective was to allow the surgeons get a detailed visual of the fetus. Further, recent studies have focused on a needle biopsy of a breast tumor.

[2] The 1950's marked the period of initial development of AR. Morton Heilig, a cinematographer saw that cinema was an entity that could draw viewers into the onscreen activity. In 1962, he built a prototype described as, "The Cinema of the future" which predated digital computing.

The Head Mount Display was invented by Ivan Sutherland in 1966. He came up with an optical see-through head mounted display, which was the first step taken toward augmentation. From then onwards, a series of inventions and discoveries on the field of augmented reality led to what we have today.

The devices that constitute to an augmented reality system are displays, input devices, tracking devices and computers. The displays used are of three types: head mounted displays, which could be worn as a part of a helmet; hand held displays, which could be a digital device like a smart phone and spatial displays, which make use of projectors, holograms, etc. AR systems could use a wide range of input devices like gloves (used by s Reitmayr et. al.'s mobile augmented system), wireless wristbands (by ReachMedia), etc. Smart phones themselves substitute as pointing devices. For example the Google Sky Map is an application designed such that the user has to point his Smartphone in towards stars and planets which he would like to learn about.

[3] The need for computers has become inevitable for the current era. The people in this world today are being existed in two different worlds, the true Earth and the digital world which are entirely different.

Augmented reality makes the digital world understand the working of the real world and allows digital and real world interact with each other. This is often termed as Augmented Interaction. This interaction makes sure that it reduces the complexity of computer manipulations which even allows people with less computer knowledge to use it. A few attempts have been taken to produce prototypes in which one of it is NAVICAM (NAVIgationCAMera). This NAVICAM has a small

video camera in it which detects the real world situations and that makes user experience the generated informations applied to the real world. The voice command which is added to this technology makes people feel as if they are having an actual person with them who guides him/her whenever required.

The main aim of this technology is to recognize the intention of the user and react accordingly. But since it is just the beginning of this technological transformation, the situations are just a clue to the machines. If these proposed prototypes come to practicality, there would be a drastic change in the human lifestyle.

[4] Apart from saying that education is a must for everyone, now the scenario has changed that everyone gets an insight on most of what they can make out so that they survive among the wittiest. People often incline to facilely acquire knowledge through practical ways rather than theoretical way of work-place. Now the education system is craving for the advancement in technology, which paves the way for augmented reality.

At present the society has a perplexity to choose from digital and the real world where they can involve themselves. But Augmented Reality makes them into a single existence where people can get an immense experience out of it. The use of augmented reality in education makes people study sundry concepts practically without even using the required apparatus. The interface that students get to use turns out to be an authentic experience.

For example when medical students are in need to get an experience on surgery, the surgeon can actually guide the learner to do the surgery by step wise instruction using augmented reality. Here the surgeon need not even be there. The 3-D image of the surgeon's hand can actually be sent out into the space where the surgery is taking place so that the student gets an overall experience. When students are working with machine-like copies made to scale, they can get a complete overview about the structure and the parts of the machine without evening opening the machine.

It even makes kids reading stories interactive where the characters can be brought to life through a holographic projection.

[5] Augmented Reality has been widely used because of its' features in a variety of fields such as manufacturing, design, technology presentations, or clinical psychology. In the educational domain, researchers are actively working to develop AR in learning.

In 2010, Johnson, et al. stated, "AR has strong potential to provide both powerful contextual, on-site learning experiences and serendipitous exploration and discovery of the connected nature of information in the real world."Augmented Reality has been applied to education and business for experimentation. Even though it has not made an impact in education and other fields as much as classic methods since the last two decades, today's technology makes AR competent and compact enough to deliver AR in corporate settings and education through personal computers.

In the field of business, AR can be implemented in several areas. It would help give assistance to employees working with highly complex machines the industry. The use of AR in vehicles and military would also be quite helpful. As for its use in education, AR would drive students to learn better in practical application with more details and clear picture of the subject. There has been tremendous development on implementing AR on these fields. It is just a matter of time until which AR would be a basic requirement on the industries.

[6] The field of surgery requires the utilization of AR for the advancement of effective results. One of the main issues that people are facing currently is the lack of skilled doctors. And sometimes even if the surgeon turns out to be adept, the need of technology arises. Improvement of technology

in the field of healthcare is adequate for the current era. The Google Glass contrivance is recently being used in the field of surgery for the betterment of the outcome. This was tested in several medical centers before coming into practicality. Utilizing this technology, a surgeon who is far away can guide the medico who is giving effect to the surgery. The experience would be as if the remote surgeon is actually present there where the surgery is taking place. This was made possible by the utilization of Google Glass.

There were many successful outcomes of which one was the surgery of a sixty six year old man's shoulder bone. But as this was the first version prototype, the surgeons had to face the quandaries caused by this technology. The problems were viewing angles which did not match through being without error, the battery drain, poor audio quality and as such. So the industry expects to have a range of observation of getting well and a scope of amendment in such technologies for the betterment of healthcare industry.

[7] Augmented reality requires a special requisite where the structure is engendered by the computer graphics and are linked with the scenes that are visually perceived by the humans i.e. the position of the scene and the computer generated graphics have to match. For e.g. AR is used to guide the mechanics who repair the aircraft parts during aircraft maintenance. During inspection of the aircraft an object known as "Head Mounted Display" also known as HMD is used.

This HMD works on the substructure of AR and is used to view the plane's blue print in a virtual view generated by the computer graphics. This HMD is used by service engineers during the time of inspection. Similarly the HMD can be used by surgeons to perform surgery as HMD produces the blue print of the organs so that the surgeons are able to do the surgery without any difficulties.

The latest challenge of AR in view of medicine is the development of "Computer Aided Surgery" (CAS) which guides the surgeon to perform surgery. It works on method of intra operative image processing which belongs to the field of AR. The benefit of using CAS is that it makes surgeon concentrate more easily on the surgery in lieu of visually perceiving the monitor.

[8] Augmented reality is nowadays used in Laproscopic surgery so that it is comfortable for surgeons who perform surgeries without optically canvassing the monitors which are present to designate the positions of organs and the instruments used during the surgery.

Here the framework contains a head which has a six degree liberation, it additionally uses 3D visualization and also extracts laproscopicimages. Here the system produces a real and virtual image which is actually merged and is visible in the surgeon's head mounted exhibit. By using AR technologies we can reduce the problems which are caused by laproscopy.

[9] Augmented Reality technology proves to be useful in a lot of fields like education, business, entertainment, etc. Along with these, it additionally proves to be subsidiary in tourism, to amend tourist experience to a great extent. As for the field of tourism, AR would prove to be highly useful to both the organizations as well as the tourists. The service providers would be able to reach a wider range of audience by implementing AR to deliver overwhelming media content and information. AR would give the tourists immense entertainment and contentment by sanctioning them to get facile information and cognizance about their circumventions instantly.

Web servers, internet service, database for information, location based AR applications, GPS, high CPU speed, graphics, considerable RAM are all requirements for the use of AR in tourism. The use of Smartphone would cover most of the requirements above and is quite compact for efficient use.

[10] When it comes to tourism, Augmented Reality plays a decisive role. The most prevalent problems faced by the tourists are habituating to their tourist spots. People generally get perplexed with the language, history of that place and sometimes they don't even know what that place is. Here utilizing Augmented Reality ascertains an availing hand for those who seek it. As previously, for using Augmented Reality, there is no need of any separate device. It can be embedded in your mobile phones and be handy to the users. People get acquainted with the details on the places they visit, location details, etc.

But there some problems associated with the use of this technology like the lack of visualization of the content. Sometimes circumscribed exhibit content additionally engenders a disadvantage.

Findings

The research of this analysis has brought a high level of clarity of purpose with this overwhelming technology Augmented Reality. Initially it was thought that Augmented Reality is a concept under development and that it has an exceptionally slender territory of utilizations, constrained to amusement and gaming. It was additionally taken that the study of Augmented Reality is not taken to a very great extent and has very less people working on it.

In the study, it was found that it had great potential in the field of healthcare and creation of Augmented Reality dated back to the 1960's and had its first use in cinemas. The study was done on the working principles, technological requirements, feasibility and uses. The areas of application covered in the preparation of this journal are education, business, medicine, tourism, entertainment, day to day domestic uses, etc. The developments of this technology for future uses were also studied. This journal helped in understanding the growth of technology and its impact in day to day life.

Recommendation & Conclusion

The next step of this journey of AR would be not out of willingness, that being highly indispensible to apply the proficient skillset to multiple processes for e.g. projectors with holographic image sensing technology where it allows users to work with virtual objects as precise as the real objects. Enhancing the concept of completely hands-free driving technology. It would help configuration precisely fit generation for real time uses.

Augmented reality is the innovation that clears approach to different extraordinary potential outcomes and will be inexhaustibly required later on. If education system completely utilizes Augmented Reality, then learning would turn out to be most intriguing, intelligent and simple rather than a sophisticated study of books and theory.

References

Azuma, R. T. (1997). A survey of augmented reality. *Presence: Teleoperators & Virtual Environments*, *6*(4), 355-385.

Billinghurst, M. (2002). Augmented reality in education. *New horizons for learning*, *12*(5).

Carmigniani, J., Furht, B., Anisetti, M., Ceravolo, P., Damiani, E., &Ivkovic, M. (2011).Augmented reality technologies, systems and applications. *Multimedia tools and applications*, *51*(1), 341-377.

Fuchs, H., Livingston, M. A., Raskar, R., Keller, K., Crawford, J. R., Rademacher, P., & Meyer, A. A. (1998, October). Augmented reality visualization for laproscopic surgery. In *International Conference* on *Medical Image Computing and Computer-Assisted Intervention(pp. 934-943).* Springer, Berlin, Heidelberg

Kounavis, C. D., Kasimati, A. E., & Zamani, E. D. (2012). Enhancing the tourism experience through mobile augmented reality: Challenges and prospects. *International Journal of Engineering Business Management*, *4*, 10.

Lee, K. (2012). Augmented reality in education and training. *TechTrends*, *56*(2), 13-21.

Ploder, O., Wagner, A., Enislidis, G., & Ewers, R. (1995). Computer-assisted intraoperative visualization of dental implants. Augmented reality in medicine. *Der Radiologe*, *35*(9), 569-572.

Ponce, B. A., Menendez, M. E., Oladeji, L. O., Fryberger, C. T., &Dantuluri, P. K. (2014). Emerging technology in surgical education: combining real-time augmented reality and wearable computing devices. *Orthopedics*, *37*(11), 751-757.

Rekimoto, J., & Nagao, K. (1995, December). The world through the computer: *8th annual ACM symposium on User interface and software technology* (pp. 29-36). ACM.

Yovcheva, Z., Buhalis, D., &Gatzidis, C. (2012). Smartphone augmented reality applications for tourism. *E-review of tourism research (ertr)*, *10*(2), 63-66.

ARTIFICIAL INTELLIGENCE, A REVOLUTIONARY STEP TOWARDS LIFE

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What is Artificial Intelligence?

[1] The Process of making intelligent machines using science and technology especially computer related programs is called Artificial Intelligence. Its equivalent to similar task in which Artificial Intelligence is able to understand and do the work as and according to human intelligence. [2] Artificial Intelligence is the field of engineering in computer science that attempts to build intelligence according to a human mind in computers andmachines.AI is an activity that makes computer intelligent according to a human mind. Artificial Intelligence has become a part of our life and one cannot imagine life without AI. [3] The main objective of using Artificial Intelligence is not only to identify the problems but also to solve them in order to ease the work load of a human. Today, Artificial Intelligence is used in each and every domain like healthcare, education, security and surveillance, and many more.

History of Artificial Intelligence

[4] The history of AI is traced according to imagination, philosophy and fiction. Early inventions in the field of engineering and electronics influenced AI. [5] In 1950, AI was first described by Alan Turing but several issues and limitations in early models prevented its acceptance all over the world. Many of these issues and limitations were some how sorted in early 2000s by deep research and learning. Today Ai systems are even capable to analyze any kind of complex-to-complex problem and solve it according to a human mind. Today in almost all the fields weare using AI in some way or the other. In 1950, Alan Turing was the first one who described the concept of using computers that can stimulate critical thinking and intelligent behavior. Later Turing described a simple test in a book *Computers and Intelligence* in order to determine whether human intelligence can be used by a computer or not.

Growth of AI

[6] Today AI is used in almost every sector be it be educational, medical, financial sectors. It has even contributed in the economy of different nations and even in manufacturing and production of Multinational companies and even small-scale businesses to some extent. [7] Artificial Intelligence in healthcare has proven to be a revolutionary step not only in medicines but also in surgeries. We can see robotics working on principle of Artificial Intelligence in management and in scientific sectors. Growth of Artificial Intelligence can be seen by the fact that it has been used to minimize traffics jams on roads by the help of sensors. [8] First described in 1950, Artificial Intelligence in early models had some limitations due to which its acceptance was prevented widespread in the field of medicine specially. But now with advancement in Artificial Intelligence (AI) with the advent of deep learning most of these limitations has been overcome in the early 2000s. We have entered a new age in medicine where AI systems, with its continuous development, are well capable of analyzing complex to complex algorithms and through risk assessment models, AI can be applied in healthcare practice in order to improve workflow efficiency, and diagnostic accuracy.

Artificial Intelligence in Health Care Appliances

[9] Artificial Intelligence and related technologies were already being used in businesses and education sector but today it has been in a major role even in healthcare sectors. These technologies have much potential to help and enhance in the care of the patient and ease the work load of doctors and other medical staffs. Many researches shows that AI can perform as efficient as or even more than a human mind in order to diagnose a disease or in other health care system.[10]we would never have thought that science and technology will develop so much that one day it will be used in health care which is the most difficult job as any small mistake might result in even losing the patient. Artificial Intelligence in the sector of healthcare has gone under so many advancements that we cannot even think of healthcare without use of AI in it.

[11] There are wide applications of AI in health care starting from organizing patient routes to providing better treatment tactics. In the case of AI, they are not bothered by the number of patients and stretch work hours. For providing right diagnosis AI uses arithmetic algorithms along with using data science from the human body. By using AI for drug discovery this process which was expensive and tedious earlier has now become cheaper and quicker.

Artificial Intelligence in Manufacturing and Production

[12] With the growing population the demand for products is increasing and so the development of manufacturing industries is also increasing. These industries are supporting pillars of any nation. AI has provided a great boost in these industries whether it would be a matter of management, security, and production and fault detection.

[13]Sustainable manufacturing that is now a very growing topic is achievable because of machine learning which is the result of AI. Because of the introduction of these now industries are focusing more on smart work which involves computerized machines undertaking processes of packaging, fault detection, and maintaining records. Work has become a lot faster and feasible.

[14] Developed countries like the US have also taken steps in this modern direction. Also, China has drafted many policies in their country for intelligent manufacturing. Some examples of reforms can be said with industry 4. 0 in which cyber physical systems form the basis of this industry.

Artificial Intelligence in Security and Surveillance

[15] AI has also proved its importance in law enforcement. To catch criminals and also to save people's lives. Because of the development of software like face recognition, police can now identify the criminals from any previous records. [16] CCTV cameras are the basic example of AI in which we can monitor our houses or offices from anywhere in the world on our phone also in traffic because of the sensors present there are now low chances of road jam and accidents.[17] Today surveillance facilities are also facilitated by Artificial intelligence, for example in detecting whether a person is entering a restricted area or if there is any illegal or unusual activities happening at a place under surveillance. AI uses the surveillance data to ensure that the person has paid for the parking or not at places where parking is paid. Countries like the US and China have developed millions of surveillance cameras at almost every place in their country and are leading in this field. China is also supplying AI based technologies to at least60countries.

Artificial Intelligence in Education

[18] Advancement of Artificial Intelligence in Education has not only benefitted students but has also helped teachers. A teacher now can teach to his/ her student at any time and at any place and

even while travelling. Gone are the times when students have to buy big bundles of books and take those to school or college in order to study. In this modern era of Artificial Intelligence, they can just download the study material on their mobiles, laptops, etc. and they can access them at any time and at any place without carrying the huge burden of books on their shoulders. And they can access information on any topic of this world by just searching it one internet.

[19] the current emerging fields in educational technologies is International Artificial Intelligence in Education Society (AIED) according to the 21st International Conference on Artificial Intelligence in Education held in 2020.

[20] Robotics are the best example of AI in education. AI has helped in creation of Robots that not only ease the world of humans but by using that student can improve their learning experience. Robots which is an application of AI in Education can work with teachers in easing their work like evaluating the answer of students, teaching the student by showing visuals of that topic.

[21] There are many online platforms that enables students to prepare not only for school exams but also in different competitive exams. Some of the examples of these include Topper, Physics Wallah, Byjus, etc.

[22] Initially computers and computer-related systems were the form of AI in education but today it is in the form of web-based and online education platform. These systems have made it possible to used Robots, a form of humanoid that can do a lot of work on its own as programmed and ease the word of human, chat bots which helps teaches in many ways as programmed. The use of these online platforms has made learning very easy on web. It has empowered teachers to teach at any time and from any place of the world. Similarly, AI has provided students with improved learning experiences because AI has enabled the customization and personalization of learning materials to the needs and capabilities of students.

Advantages of Artificial Intelligence

[23] Today AI is used in almost every sector be it be educational, medical, financial sectors. It has even contributed in the economy of different nations and even in manufacturing and production of Multinational companies and even small-scale businesses to some extent. Unlike Humans, AI can work 24/7 thus giving services to the desired customers at any time and at any place in this world.

[24] Artificial Intelligence had shown great productivity in medicines and even in surgeries. we can see robotics working on principle of Artificial Intelligence in management and in scientific sectors. Growth of Artificial Intelligence can be seen by the fact that it has been used to minimize traffics jams on roads because of sensors and all.

[25] Artificial Intelligence and related technologies were already being used in businesses and education sector but today it has been in a major role even in healthcare sectors. These technologies have much potential to help and enhance in the care of the patient and also ease the work load of doctors and other medical staffs. Many researches shows that AI can perform as efficient as or even more than a human mind in order to diagnose a disease or in other healthcare system.

[26] Machines working on the principle of Artificial intelligence do not require any kind of rest or sleep so that the wok can go on continuously without thinking about the tiredness that a human would have inherent during that work. Today, AI is used in every field of robotics, industries, stock trading, NASA space station and even in our home. We cannot think of life without AI.

[27] There are wide applications of AI in healthcare starting from organizing patient routes to providing better treatment tactics. In the case of AI, they are not bothered by the number of patients

and stretch work hours. For providing right diagnosis AI uses arithmetic algorithms along with using data science from the human body. By using AI for drug discovery this process which was expensive and tedious earlier has now become cheaper and quicker

[28] Advancement of Artificial Intelligence in Education has proved to be a revolutionary step as it not only has benefitted students but also helped teachers in easing their work of teaching. Now, A teacher can teach his or her student at any time in any part of world by the help of certain technical platforms that enables them to teach students all over the world.

Challenges or Dis-advantages of Artificial Intelligence

[29] Development of AI also leads to a major concerning problem which is that it will become a cause of huge amount of unemployment as it will soon start to substitute humans in almost every field which might lead to increased number of cases of crimes, poverty and depression.

[30] Artificial Intelligence lacks emotional and sentimental aspect and are merely able to build up a relationship between user and computer there are often regarded as black boxes. In some situations when solution to certain problems have to be given by emotional and sentimental aspect, these AI based search method won't be applicable.

[31] AI can be sometimes be a reason to mass scale destruction if it goes in wrong hands. By increasing development in AI, human jobs are affected.

[32] the AI based equipment's are very expensive it is not easily accessible to middle class and lower-class people. With automation of the bulk of work the human will become lazy. [33] AI has provided many benefits in agriculture but still there are challenges in using these AI based technologies by farmers. because of lack of knowledge and lack of experience they still do much of the work manually which is very time consuming and which could have been done faster and easily. So, we not only have to do development in the AI machines but also have to teach farmers how to use them.

Conclusion

Artificial Intelligence or simply AI has become a part of human life and life cannot be imagined without AI. AI is used in each and every domain, be it be in healthcare, or in security, be in education or be in manufacturing, we are surrounded by Artificial Intelligence. AI is used by students as well as teachers in online education, companies use AI to automate their system, AI in factories tells us when a part of the machinery could fail, thus helping the owner from bearing the looses caused by sudden failure of a part of machinery. AI is even used in healthcare. Student can study from any time and at any point of time, we can talk with our friends and family at any time and from any part in this world. But in contrast it has and is going to ruin the work of many labours as usage of AI there has and is going to replace the labour. Introduction of AI has made out life easy but has also increased our dependance on computer software and also became a reason for thousands of people losing their job. In my opinion, development of AI has proved to be a revolutionary step and has made our day-to-day work very easy but in order to maximize its use, people have to become aware on how to use these technologies.

References

Abdulov, R. (2020). Artificial intelligence as an important factor of sustainable and crisis-free economic growth. Procedia Computer Science, 169, 468-472.

Abdulov, R. (2020). Artificial intelligence as an important factor of sustainable and crisis-free economic growth. Procedia Computer Science, 169, 468-472.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. Aayushi International Interdisciplinary Research Journal, 227-230.

Bouletreau, P., Makaremi, M., Ibrahim, B., Louvrier, A., & Sigaux, N. (2019).Artificial intelligence: applications in orthognathic surgery. Journal of stomatology, oral and maxillofacial surgery,120(4), 347-354.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *AiMagazine*,*26*(4),53-53.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. Ieee Access, 8, 75264-75278

Chen,H., & Wang, F.Y.(2005). Guesteditors' introduction: Artificial intelligence for homeland security. *IEEE intelligent systems*, *20*(5),12-16.

Chen, H., &Wang, F.Y.(2005). Guesteditors' introduction: Artificial intelligence for homeland security. *IEEE intelligent systems*, *20*(5),12-16.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375

Cioffi, R., Travaglioni, M., Piscitelli, G., Petrillo, A., & DeFelice, F. (2020). Artificial intelligence and machine learning applications in smart production: Progress, trends and directions. *Sustainability*,*12*(2),492.

Davenport, T., & Kalakota, R. (2019). The potential for artificial intelligence in healthcare. *Futurehealthcarejournal*,*6*(2),94.

Davenport, T., & Kalakota, R. (2019). The potential for artificial intelligence in healthcare. Future healthcare journal, 6(2), 94

Eli-Chukwu, N. C. (2019). Applications of artificial intelligence in agriculture: A review. Engineering, Technology & Applied Science Research, 9(4), 4377-4383.

Goksel, N., & Bozkurt, A. (2019). Artificial intelligence in education: Current insights and future perspectives. In Handbook of Research on Learning in the Age of Transhumanism (pp. 224-236). IGI Global.

Gong, S., Loy, C. C., & Xiang, T. (2011). Security and surveillance. In *Visual analysis of humans* (pp.455-472).Springer, London.

Gong, S., Loy, C. C., & Xiang, T. (2011). Security and surveillance. In *Visual analysis of humans* (pp.455-472).Springer, London.

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education. Boston: Center for Curriculum Redesign.

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education. Boston: Center for Curriculum Redesign.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., & Scharre, P. (2018). *Artificial intelligence and international security*. Center for a New American Security.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., & Scharre, P. (2018). *Artificial intelligence and international security*. Center for a New American Security..

Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine. *Gastrointestinal endoscopy*, *92*(4), 807-812.

Kaul,V., Enslin,S., & Gross, S.A. (2020). History of artificial intelligence in medicine. *Gastro intestinal endoscopy*,*92*(4),807-812.

Kengam, Jagadeesh. (2020). ARTIFICIAL INTELLIGENCE IN EDUCATION. 10.13140/RG.2.2.16375.65445

Kesse, M. A. (2021). Artificial intelligence: a modern approach to increasing productivity and improving weld quality in TIG welding

Kesse, M. A. (2021). Artificial intelligence: a modern approach to increasing productivity and improving weld quality in TIG welding

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. International Journal of Library & Information Science (IJLIS), 9(1), 3.

Lee, J., Davari, H., Singh, J., & Pandhare, V. (2018). Industrial Artificial Intelligence for industry 4.0-based manufacturing systems. *Manufacturing letters*,*18*,20-23.

Liu, J., Chang, H., Forrest, J.Y.L., & Yang, B.(2020).Influence of artificial intelligence on technological innovation: Evidence from the panel data of china's manufacturing sectors. *Technological Forecasting and Social Change*, *158*,120142

manufacturing sectors. *Technological Forecasting and Social Change*, *158*,120142

McCarthy,J.(2007).What is artificial intelligence.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–are view.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Nilsson, N. J. (2009). *The quest for artificial intelligence*. Cambridge University Press.

Roll, I, & Wylie, R.(2016), Evolution and revolution in artificial intelligence in education. International Journal of Artificial Intelligence in Education, 26920, 582-599

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6)

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6)

VARIOUS ASPECTS OF ARTIFICIAL INTELLIGENCE

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What is AI?

Ref 1: [1]Artificial Intelligence is the science of making machines with human intelligence like computers. It is used to understand human nature using computer knowledge. Intelligence is the mathematical aspect of person's capacity to accomplish goals in the real life. Sometimes, but not always or even most of the time. On the one hand, we can learn a lot about how to make robots solve problems by watching other people or simply studying our own processes. On the other hand, rather of studying people or animals, most AI research focuses on the issues that the world presents to intelligence. Researchers in AI are free to utilise methods that have never been observed in humans or that require far more computing than humans are capable of.

Ref 2: [2]One of the interesting facts about Artificial Intelligence is it is difficult to identify the subject.The majority of artificial intelligence research has focused on simulating the symptoms of intelligent behaviour that we see in ourselves. Investigation into the underlying factors of intelligence has been omitted in order to achieve the intelligence's direct effects more quickly. These efforts yielded computer programmes with exceptional performance, but only in a few application domains.

History of AI

Ref 1: [3]The history of Artificial Intelligence can be followed back to philosophy, literature, etc. Problem solving, knowledge representation demonstration in language understanding, translation, etc were the early achievements. AI has been affected by early inventions in electronics, engineering, and a variety of other fields. Work in problem solving, which includes foundational work in learning, knowledge representation, and inference, as well as demonstration programmes in language comprehension, translation, theorem proving, associative memory, and knowledge-based systems, were among the early milestones. The essay concludes with a look at some of the field's most significant organisations and contemporary issues.

Ref 2: [4]Standard concept of creating Artificial Intelligence is the system must have a goal through its actions which has global economy and massive influence in it.

Growth of AI

Ref 1: [5] The future of health care may change significantly as entrepreneurs provide artificial intelligence-based solutions that change how we prevent, diagnose, and treat illnesses (AI). This article examines AI-driven health-care businesses and highlights emergent business model paradigms that entrepreneurs from around the world are employing to bring AI solutions to market. It identifies areas of value creation for AI in health care applications and presents a method for developing business models for AI health care businesses.

Ref 2: [6] Artificial intelligence, particularly machine learning (ML), is the most important general-purpose technology of our time. ML refers to a machine's ability to continually improving its performance without humans needing to explain how to complete all of the jobs it is assigned. Machine learning has grown significantly more effective and readily available in the last several years. We can now create systems that self-learn how to complete tasks.

AI in Healthcare Appliances

Ref 1: [7] Artificial Intelligence has become a well known field in computer science, as it has improved the lives of human lives in many areas.Human performance in a variety of fields is improving, and there is reason to believe that this trend will continue in healthcare. AI could help with disease prevention, detection, diagnosis, and therapy. Cancer, neurology, cardiology, and diabetes are among the major illness areas where AI is used. The present state of AI applications in healthcare is discussed in this review. AI may also be used to detect problems and threats to patient safety with high accuracy and speed, such as patterns of sub-optimal treatment or outbreaks of hospital-acquired illness.

Ref 2: [8] Human intervention is minimal when it comes to AI. Artificial intelligence (AI) systems that aid front-line healthcare personnel in detecting and monitoring disease efficiency. In the Covid-19 pandemic, artificial intelligence (AI) has performed well for us. Because robots are not suspected of being infected with the virus, they are being used to complete a variety of activities such as cleaning, distributing food packages to suspected regions, and administering medicine to reduce the need for human intervention. AI has been used in a variety of fields, including programme translation and intelligent personal assistants. Along with the growing use of electronic health records (EHRs) and the rapid development of bioscience, including neuroscience, AI has found various applications in the medical industry.

Ref 3: [9] AI can be used in health care to streamline the check-in process for patients, improve the efficiency of patient records, monitor disease, aid diagnosis, assist in surgical procedures, and provide mental health therapy. AI helps radiologists with a variety of tasks, including patient scheduling, billing, staffing optimization, protocol creation, picture quality assessment, radiation dose reduction, and image interpretation. AI should not be feared because it will not replace people; rather, it should be embraced because of its ability to improve and extend human life.

AI in Manufacturing and Production

Ref 1: [10] Artificial intelligence (AI) technology has recently received a lot of interest in the industrial industry. It attracts a lot of attention as a crucial technology in smart manufacturing and the Industry 4.0 agenda. Product lifecycle management (PLM) encompasses a wide range of engineering, business, and management operations that occur throughout the lifecycle of a product, from the conception of an intangible concept to the recycling of a finished product.

Ref 2: [11] Cloud computing, the Internet of Things, the Industrial Internet of Things, Big Data, Blockchain, Cyber-Physical Systems, Artificial Intelligence, and other new, innovative technologies characterise the fourth industrial revolution, dubbed Industry 4.0. Artificial Intelligence (AI) technology is becoming increasingly important in modern production, especially in the context of the Industry 4.0 paradigm.

Ref 3: [12] Modern industrial and logistics systems rely on increasingly pervasive and powerful computing networks to function. Oceans of data are constantly generated by sensors, machines, systems, smart devices, and individuals within these networks. Big Data is being analysed quicker, more broadly, and more deeply than ever before, thanks to growing computer capabilities. These developments have re-defined the usefulness of Artificial Intelligence (AI) technology, ushering in a new era known as Industry 4.0, or the Smart Factory.

AI in Security and Surveillance

Ref 1: [13] Surveillance cameras can be used for a variety of purposes in newly developed cities, including smart traffic, healthcare, monitoring, and security. Egypt's new administrative capital, "New Cairo," is one of the most well-known new cities. Egypt's new administrative capital is mostly known for its green lifestyle, which is exemplified by the "Green River."

Ref 2: [14] Nowadays, video surveillance systems (CSS) are in high demand in a variety of industries for smart manufacturing. However, the increased use of CSS will have a number of limitations in terms of storage capacity and transmission bandwidth. This project attempts to design a revolutionary artificial intelligence (AI)-based data processing algorithm based on real-world needs. Artificial intelligence (AI) can be used to process a huge number of videos captured by the CSS, and computer vision algorithms can be used to recognise deviant behaviours or notable things, lowering labour requirements.

Ref 3: [15] To solve concerns such as society, environment, morphology, and many others, cities are increasingly turning to specialised technologies. Smart Cities, a new idea that promotes the integration of sensors and Big Data via the Internet of Things, is a strong supporter of this possibility (IoT). This avalanche of data opens up new possibilities in city planning and management, as well as new commercial opportunities. While Big Data processing via Artificial Intelligence (AI) can make a significant contribution to the urban fabric, sustainability and liveability must not be disregarded in favour of technological advancements.

AI in Education

Ref 1: [16] For over 20 years computers have been used. The first computer based training (CBT) and computer aided instruction (CAI) have been used for teaching computers. The instructions in these were not customised for students instead the guidelines for taking a student were scripted.While CBT and CAl may be helpful to some students, they do not provide the same level of specialised attention that a student would receive from a human tutor. To give such attentiveness, a computer-based educational system must reason about the domain and the learner. This has sparked interest in intelligent tutoring systems research (ITSs). ITS allows for more flexibility in material presentation and a better ability to respond to unique student demands.

These systems gain intelligence by capturing pedagogical decisions about how to teach as well as learner information. This gives you more flexibility by allowing you to change the colour scheme.

Ref 2: [17] AI in education mainly focusses on development of AI techniques for the study of human teaching and developing the system to enhance the human learning.When it comes to the engineering side of the topic, the phrase "intelligent tutoring system" (ITS) is widely employed. Planning, control, knowledge representation and acquisition, explanation, cognitive modelling, and dialogue management are all supported by computational approaches. Alternative learning theories are investigated and evaluated using computational models. The prospect of developing powerful teaching systems with more domain knowledge, increased capacity to form inferences about student behaviour, and increased reasoning ability about topic selection and response production motivates the research.

Ref 3: [18] OLM(Open Learner Modelling) and ITS(Intelligent Tutoring System) mainly focusses on interpretability of basic AI representation. OLMs are used for opening up AI models of learners 'cognition and and emotion in order to help human learning and teaching.Over thirty years of ITS (also known as AI in Education) research has resulted in essential work that explains how AI can be utilised in Education to greatest effect and, through the OLM study, what considerations are required to make it interpretable and explainable for the benefit of learning.

Advantages of AI

Ref 1: [19] AI applications are used to recreate human intelligence ignorer to solve the problems and for making decisions. Some of the advantages of AI are permanency reliability, and cost effectiveness.AI has been used in a variety of modelling, prediction, decision support, and control applications in fields as diverse as engineering, economics, linguistics, law, manufacturing, and medicine (1). One of the most potential AI applications is its widespread use on the Internet, such as in search engines (2). Although AI has great efficacy, it, like any other application, has limitations in terms of capability and functionality. These constraints will be discussed more in this essay. Before going over AI's drawbacks, this article will go over some of its benefits.

Ref 2: [20] Artificial Intelligence has many benefits. This field of science provides us capability to evolve completely and go to the history of artificial robots. Artificial intelligence has great benefits; what this field can offer us is the ability to evolve definitively and go on to the history of artificial robots. Artificial Intelligence's key benefits are as follows:Finished task faster than a human,Stressful and complex work completed easily, Difficult work done in short period,Various functions can done at a time, Success ratio is high,Less errors in task and defects also,More efficiency in short time, Less space, less size,Calculation of long term and complex situations, and Discover unexplored things. i.e. outer space.

Ref 3: [21] Some areas of AI constantly use Empirical methods. Such as, standard domain planning and search algorithms, etc. However for some applications like user modelling, empirical is rare. For example, only about a fourth of the articles in User Modeling and User Adapted Interaction (UMUAI) report significant empirical evaluations. A simple evaluation study with limited sample sizes and typically no statistical methodologies is included in many of them. Empirical research, on the other hand, is required for estimating the effectiveness, efficiency, and usability of a system that employs AI approaches in real-world scenarios. Empirical evaluations are especially important for user modelling strategies that are based on human-computer interaction.

Ref 4: [22] Human work can be reduced by using Artificial Intelligence. Humans can be replaced with machines, while humans can be doing other work. Artificial Intelligence is like a cheap labour which can be used for the works which needs to be done fast and also leads to profits.

Ref 5: [23] Usage of AI leads to highest accuracy with zero amounts of risks. Robots which are using AI can be used for various purposes like sendingthem to the space and exploring things there. Sending them to the deep oceans, knowing about the deep earth, extracting the fuel,When performing repetitive and time-consuming jobs, artificial intelligence can be quite useful.

AI can do jobs that are hazardous to human health and life, like as rescuing people and putting out fires, etc.

Disadvantages of AI

Ref 1: [24] The following are some of the most significant drawbacks of Artificial Intelligence (AI) in our daily life. It can be misused at times, resulting in enormous disaster; programme mismatches are sometimes carried out in the opposite direction of the order;

Human jobs are being impacted, the unemployment rate is rising, creativity is reliant on programmers, there is a lack of human touch, the younger generation is becoming lazy, it takes a lot of time and money, and technological dependency is increasing.

Ref 2: [25] Due to expensive machines it is not easy to upgrade them, it can cost tons of money to build, recreate, repair. Replacing robots with humans leads to severe unemployment, machines can be easily destroyed if they go to a wrong person's hands, etc.

Some of the disadvantages of AI are as follows:It is difficult to design machines since the necessary equipment is costly, Creating, rebuilding, and repairing can be extremely expensive in terms of both money and time. Robotic repair may be used to reduce the amount of time it takes for humans to fix things, but it would cost more money and resources, Robots can cause severe unemployment if they replace jobs that AI can't perform, or if humans can repair the unemployment by doing things that AI can't do, or if the government is significantly changed to communism. If placed in the wrong hands, machines can quickly bring havoc. That is, there should be a minimum of dread of the diverse humans.

Ref 3: [26] Cost of the repair is one of the main drawbacks of AI. It should be maintained regularly, the software should be updated every time for meeting the requirements. In case of a breakdown the cost of the repair would be very high.

Ref 4: [27] Although government and schools plays a crucial role in considering artificial intelligence for business English education, maximum ideas are executed in a professional level. The main reason is that the universities create talent development programmes. AI awareness and ability training is not completely created for higher studies. Innovation and entrepreneurship education will be difficult to progress smoothly if the artificial intelligence training goal is not incorporated in the professional education plan.

Ref 5: [28] The future generation may look back to our time and states it as a rapid change era. IN a matter of decades, we've changed rapidly to information based society. Artificial agents(including various forms of AI) are the tools that involve in decision making and solely depends on automated.Referring to gadgets and decision-making aids that use automated, data-driven, or algorithmic learning techniques (including artificial intelligence (AI) in its various forms) as artificial agents. Devices as simple as Roomba robots and internet recommendation engines to more complex cognitive systems like IBM's Watson fall under this category. Such agents are increasingly becoming incorporated in our daily decision-making. As a result of their introduction and adoption, a slew of policy issues have arisen.

Conclusion

Artificial Intelligence has become a vital role in a human life where we can complete all the works so easily and efficient with it. The human life rely on the AI for almost each and every work going in the present world. There are some disadvantages of AI also but they can be reduced with some practices and enjoy the advantages of it. AI is at the heart of a new business that creates computational intelligence models. The main assumption is that intelligence (human or other) can be expressed in the form of symbolic structures and operations that can be programmed on a digital computer.

References

Allam, Z., & Dhunny, Z. A. (2019). On big data, artificial intelligence and smart cities. *Cities*, *89*, 80-91.

Beck, J., Stern, M., & Haugsjaa, E. (1996). Applications of AI in Education. *XRDS: Crossroads, The ACM Magazine for Students*, *3*(1), 11-15.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. Aayushi International Interdisciplinary Research Journal, 227-230.

Brynjolfsson, E., & Mcafee, A. N. D. R. E. W. (2017). Artificial intelligence, for real. *Harvard Business Review*.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Conati, C., Porayska-Pomsta, K., & Mavrikis, M. (2018). AI in Education needs interpretable machine learning: Lessons from Open Learner Modelling. *arXiv preprint arXiv:1807.00154*.

Eldrandaly, K. A., Abdel-Basset, M., & Abdel-Fatah, L. (2019). PTZ-surveillance coverage based on artificial intelligence for smart cities. *International Journal of Information Management*, *49*, 520-532.

Fogel, D. B. (1993). Evolving artificial intelligence.

Garbuio, M., & Lin, N. (2019). Artificial intelligence as a growth engine for health care startups: Emerging business models. *California Management Review*, *61*(2), 59-83.

Guo, M. Advantages And Disadvantages Of Artificial Intelligence In Business English Teaching.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Lancellotti, C., Cancian, P., Savevski, V., Kotha, S. R. R., Fraggetta, F., Graziano, P., & Tommaso, L. D. (2021). Artificial Intelligence & Tissue Biomarkers: Advantages, Risks and Perspectives for Pathology. *Cells*, *10*(4), 787.

McCarthy, J. (2007). What is artificial intelligence?.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Nguyen, M. T., Truong, L. H., Tran, T. T., & Chien, C. F. (2020). Artificial intelligence based data processing algorithm for video surveillance to empower industry 3.5. *Computers & Industrial Engineering*, *148*, 106671.

Osipov, S. S., & Ulimova, N. V. (2013). Advantages and disadvantages of ai. *Science and world*, 77.

Osipov, S. S., & Ulimova, N. V. (2013). Advantages and disadvantages of ai. *Science and world*, 77.

Osoba, O. A., & Welser, W. (2017). The risks of artificial intelligence to security and the future of work. RAND.

Russell, S. (2021). The history and future of AI. *Oxford Review of Economic Policy*, *37*(3), 509-520.

Subha, T., Ranjana, R., & Sheela, T. (2021). Influence of AI, BC and IoT for Healthcare–II. In *Blockchain, Internet of Things, and Artificial Intelligence* (pp. 219-233). Chapman and Hall/CRC.

Wagner, J. B. (2019). Artificial intelligence in medical imaging. *Radiologic technology*, *90*(5), 489-501.

Wang, L., Liu, Z., Liu, A., & Tao, F. (2021). Artificial intelligence in product lifecycle management. *The International Journal of Advanced Manufacturing Technology*, 1-26.

Weibelzahl, S., & Weber, G. (2002). Advantages, opportunities and limits of empirical evaluations: Evaluating adaptive systems. *KI*, *16*(3), 17-20.

Woolf, B. (1991). *AI in Education*. University of Massachusetts at Amherst, Department of Computer and Information Science.

Zeba, G., Dabić, M., Čičak, M., Daim, T., & Yalcin, H. (2021). Technology mining: Artificial intelligence in manufacturing. *Technological Forecasting and Social Change*, *171*, 120971.

VARIOUS ASPECTS OF ARTIFICIAL INTELLIGENCE

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What is Artificial Intelligence?

[1] The term artificial intelligence refers to the fast computers we use, all those machines which are used to imitate human intelligence to make our work faster and easier with less labour work. It also includes software that helps us achieve our goals more quickly. [2] The intelligence or problem solving capability shown by artificial entities such as robot managers in hotels made by humans embedded with mechanisms which solve the problems according to situations at hand can explain the very meaning of artificial intelligence.

History of Artificial Intelligence

[3] In history this huge growing sector was mainly based on fiction and imagination andwho would have thought that giant computerised machines and more compatible and smart robots will become major part of modernisation. At first the milestones in this field were proving of theorems and helping in providing and translation of associativememory.

[4] In the 1940s when programmable digital computers were made it gave the idea to a few of the scientists to make an artificial brain based on the concept of mathematical reasoning. Some think that John Mccarthy has come up with this term for the first time but it was used much earlier which was shown in seminal work of Vannevar Bush.

Growth of Artificial Intelligence

[5] Artificial intelligence is now used in more and more sectors. In medical, financial, educational, it has also majorly contributed to the growth of economy of nations and the production of mega companies such as many of the tech giant organizations. [6] We can see that in healthcare sector AI has shown huge productivity in research of medicines and surgeries including robotics. In the field of management we can see robotic workers working as receptionists etc, also to keep huge chunk of data's which are accessible readily and also help in the field of cyber security . Examples of its growth can be seen that now we are able to reduce traffic jams because of sensors that are able to sense road conditions. Now we can also make calls with the help of smartwatches and use them as mini smart phones.

Artificial Intelligence in Healthcare Appliances

[7] There are several applications of AI in healthcare sector starting from managing patient routes to provide better treatment facilities. By the help of AI they are not concerned by the number of patients and long working hours.

For providing correct diagnosis AI uses arithmetic algorithms along with using data science from the human body. By the use of AI for drug discovery this process which was earlier very expensive and laborious has now become cheaper and faster. [8] In healthcare appliances AI has played a major role in the development and growth of flexible pressure sensors. These sensors provide a number of advantages, including a high degree of flexibility and compatibility with large-area processing methods.

Pressure sensors have yet another essential application called mobile bio-monitoring which can be utilized for medical diagnostics.

[9] We would have never imagined that science would evolve so much that we would be able to see surgeries performed by robots as an accomplishment of AI in the healthcare sector. These special surgeries assisted by robots were developed to improve the capability of the surgeons performing open surgery. The surgeons use robotic arms controlled by computer for assistance and its end results. The best advantage of using these computerized techniques is that the surgeons may not be available during the duration of surgery rather they can be anywhere in the world.

Artificial Intelligence in Manufacturing and Production

[10] AI has been of major help in manufacturing systems which are namely automated visual inspections, maintenance and fault detections.

People are attempting to apply this knowledge to tasks such as production planning and material handling. AI has great potential in the field of semiconductor manufacturing. [11] Manufacturing is a powerful pillar of a nation's economy and support many livelihoods. The deep fusion of information communication technology and product related know-how enables a revolutionary transformation of manufacturing approaches. Developed countries such as the US and UK have drafted many policies for intelligent manufacturing. One of the example is "Industrial Internet" in 2012 to connect people , data , intelligent equipment to enable smart and quick decision making. [12] In case of India as it is an agrarian country most of its revenue comes from agriculture sector with the advancement of latest technologies and their usage will encourage it's growth. With the help of AI and ML systems, farmers can make packaged produce and storage more effective, with less waste, and can also provide smart data on crops to enable smart inputs.

Artificial Intelligence in Security and Surveillance

[13] In this developing world there is a growing need for advanced security systems. AI has proved its importance by providing various intelligent software's and machines. Basic examples are CCTV cameras used for surveillance and also with the use AI and DeepNeural Networks , VCA software's is trained to identify and control several differentiatedobjects.

[14] In law enforcement the face recognition software is of great use to identify the criminals from their past records.This feature has made their work faster and they are able to collect such huge chunk of data with greater ease. In this field machine learning techniques can be used for regeneration and to compare video backgrounds and to help forensic teams for identifying vehicles. We can say that Artificial Intelligence is the coming transformation in video analytics. Video monitoring software's which are growing with time are also playing an important role in themilitary.

[15] To facilitate monitoring facilities, AI helps in detecting if a person is entering a restricted area or if there are any unusual behaviors and it reports it. AI uses the surveillance data to ensure that the person has paid for the parking's. Countries like the US and Chinahave developed millions of surveillance cameras and are leading in this field. China is supplying AI based technologies to at least 60countries.

AI in Education

[16]AI plays an important role in education, it involves techniques for the study of human teaching and engineering that helps the human learning and research. It seems a long term helping hand for the humans. The term 'Intelligent tutoring system'(ITS) is used at a large scale for the engineering side of disciple. Computational methods are used to help in planning, enhancing knowledge, control,

modeling, dialog management, etc. It is also used to explore and evaluate different theories about global education. Three types of goals seems to be game changing in field of education, i.e. the use of AI, cognitive science techniques to use in problem solving domain as well as tutors teaching and student learning in that particular domain. Some teaching strategies that is difficult to attain in class becomes easy to understand with the help of AI. [17]In the modern era the belief on technology is been increased at very high rate and it is keep increases. AI plays an important role in that, to changing the relation and evolving a good relation between teacher and student, as well as among the students also. Let's focus at instance that the issue of 'Technological inclusion' of individuals through education has a deep social, economical and political effects, such as the individuals is being fit to join the market and contribute to the economical development of societies. It also expands the way of learning. Christensen notes was very successful use of technology in classroom is highly dependent on teachers attitudes towards computers which will lead to the great enhancement in education. [18]Nowadays creation of Handbook by AI is attempted to make the concepts, methods, tools, and main results of research accessible to a broad scientific and engineering audience by both the writers and editiors. Currently AI work is very used to practice specialists and other interested computer scientists. But the field is growing tremendously in every field of education, researches, scientific experiments and many more. With this book the writer is trying to build a bridge that are easily crossed by engineers, experts, scientists, researchers and our own computer science colleagues. The main goal of this book is to construct instructional programs that is well prepared to optimized for each student.

Advantages of AI

[19]AI apply an empirical research methodology for planning and search algorithms that are used in common domains, as well as learning the machine language by using the actual data. If you look at fields like modelling and empirical investigations, it appears to be quite unusual. This is only the one-forth of the articles published in User Modeling and user adapted interaction. It enhances the effectiveness, the efficiency and the usability of the system. [20] The widespread deployment of AI applications in any tool contributes to the establishment of dependability. It has proved itself to be very reliable in various applications because of its ability to use intelligence similar to human in a reasoning process. It also helps to save money by minimizing the requirement for personal time.If a company has to save costs, it may turn to AI at the right moment and in the right way. It has afantastic talent of decision making which leads to reduction in operational costs. [21] AI consist of two words one is 'Artificial' and the second one is 'Intelligence' which means manmade and intelligence i.e. the capacity or ability of thinking respectively. AI may be defined as an area of computer science established by humans to create intelligent computers that can behave like people and digest information considerably quicker than humans. It can also reduce the time, money, efforts of the human. It consists of specialized machines that are used to solve complicated issues. It is very useful for both the humans as well as for the society. [22] AI gives the highest amount of accuracy and with complete zero error.It's utilized in a variety of applications, including robots that explore space, the depths of the earth, the depths of the oceans, and many other locations where people can't go. It can also be utilized as a life-saving alternative since it can perform tough tasks that humans are unable of. Smartphones are the great examples of AI such as Alexa, which makes your work easier only using the voice command. [23] AI emphasizes on symbolic and non-algorithmic problem solving methods. Its intelligence is based on its capacity to control labor, confine space, and make things simple in comparison to humans. It has transformed the society beyond imagination. Natural

language processing, pattern discovery, expert systems, and robotics are all sub-areas with the objective of working similarly to human intelligence.

Challenges or Disadvantages of AI

[24]AI is reshaping the world in its own way so their emerges some of the impacts or some harms on the society. It is a concern to look upon the servers on regular basis. It is also important to educate future members of society, stakeholders in a such a way that AI might not impact the life of people. They should take their responsibility to increase its benefits without losing its potential harms. AI cannot take care of the standard ethics of the society. We have to look that no lack in privacy should emerge through this technology. [25] Some experts make investigations on disadvantages of AI in 1987. They discovered that it can be harmful on mental attitudes such as beliefs and intentions. Data literacy to manage the flow of large volumes of data. The human are becoming obsessed with it. Experts also found that AI is discovered by humans, but now the humans are totally dependent on technology. It is also lacking in the field of critical thinking regarding some serious issues. If it grows to be sufficiently powerful and knowledgeable, it may be able to take the role of school instructors. There were more dangers and drawbacks than indiscriminate robots and artificial intelligence uses in education. [26] Some of the main disadvantages of AI in our day to day lives are that some time it can be misused by any outsider without your permission leading to damage. It has the potential to influence human occupations, resulting in a rise in unemployment in society. It is making the younger generation dependent and lazy. A mismatched software might send it in the incorrect direction. Lack of human touch is involved. It requires a lot of time and money. Its functional originality is reliant on the coder, thus it may not be suitable for all users. Some people's mortal and social ethics may also be harmed. [27]AI based trading is also becoming the need of the hour nowadays. It shows a lot of advantages but it has plenty of negative sides also. It is anticipated that it will learn and execute more effectively, as well as dominate and exceed humans. Methods for using AI and AI-based applications vary depending on the stocks, assets, and markets. Varied time periods and modest modifications have different effects, all of which can end in loss. Following that, more investigation was required to discover particular data trends. [28] Uprising of AI and data usage in our daily life puts much concern about privacy and other ethical issues. We suggest that what is needed now is a way to comprehensively understand these issues and find mechanisms to resolve these issues. We propose that some principles of responsible research and innovation might serve as the framework for acting in such a way that the technology we use become socially acceptable, attractive, and sustainable. We want to utilize AI responsibly so that it does not hurt anyone and protects our data from being disclosed, among other things.

Conclusion

I believe that many of us have benefited from AI in our lives, whether we realize it or not. Taking online lessons and viewing large-scale manufacture of diverse things by computerized machines are two examples. AI's introduction has undoubtedly aided us in numerous ways, making our work easier and more efficient. The issue emerges, however, when it comes to the working class or those who cannot afford this luxury. They work in these areas, but if people continue to lose employment as a result of AI, then this world of scientific fantasies is not benefiting everyone equitably.Also, in order to deploy AI in many areas, people must be taught; however, who will train them, since employees in firms are required to master machine learning and languages in advance. Millions of people are expected to lose their jobs in the coming years, so introducing AI machines, robots, or money advanced technology can be efficient or money advanced technology that will come with

time, maybe not today, but research is underway on how to make it more safe and easy to work with. The problem of unemployment must be solved, and people must be trained in the proper use of AI systems. The other shortcomings will be addressed one by one as human research progresses.

References

Abdulov, R. (2020). Artificial intelligence as an important factor of sustainable and crisis- free economic growth. *Procedia Computer Science*, *169*,468-472.

Beck, J., Stern, M., &Haugsjaa, E. (1996). Applications of AI in Education. *XRDS: Crossroads, The ACM Magazine for Students*, *3*(1), 11-15.

Bhbosale, S., Pujari, V., &Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intelligence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Borenstein, J., & Howard, A. (2021). Emerging challenges in AI and the need for AI ethics education. *AI and Ethics*, *1*(1), 61-65.

Bouletreau, P., Makaremi, M., Ibrahim, B., Louvrier, A., &Sigaux, N. (2019).Artificial intelligence: applications in orthognathic surgery. *Journal of stomatology, oral and maxillofacial surgery*, *120*(4), 347-354.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4),53-53

Charles, J. (1998). AI and law enforcement. *IEEE Intelligent Systems and their Applications*, *13*(1),77-80

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications,and casestudies

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375

Clancey, W. J., Bennett, J. S., & Cohen, P. R. (1979). *Applications-oriented AI research: Education*. STANFORD UNIV CA DEPT OF COMPUTER SCIENCE.

Dhanabalan, T., &Sathish, A. (2018). Transforming Indian industries through artificial intelligence and robotics in industry 4.0. *International Journal of Mechanical Engineering and Technology*, *9*(10),835-845.

Dick, S. (2019). Artificialintelligence

Guilherme, A. (2019). AI and education: the importance of teacher and student relations. *AI & society*, *34*(1), 47-54.

Ke, R., Zhuang, Y., Pu, Z., & Wang, Y. (2020). A smart, efficient, and reliable parking surveillance system with edge artificial intelligence on IoT devices. *IEEE Transactions on Intelligent TransportationSystems*.

Kesse, M. A. (2021). Artificial intelligence: a modern approach to increasingproductivity and improving weld quality in TIGwelding

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

McCarthy, J. (2007). What is artificial intelligence?.

Mosteanu, N. R. (2020). Artificial Intelligence And Cyber Security–Face To Face With Cyber Attack–A Maltese Case Of Risk Management Approach. *Ecoforum Journal*,9(2).

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–areview.

Russell, S., & Norvig, P. (2002). Artificial intelligence: a modernapproach.

Stahl, B. C., & Wright, D. (2018). Ethics and privacy in AI and big data: Implementing responsible research and innovation. *IEEE Security &ivacy*, *16*(3), 26-33.

Tao, B., Díaz, V., & Guerra, Y. (2019). Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher. *Arctic Journal*, *72*(12), 30-50.

Tao, B., Díaz, V., & Guerra, Y. (2019). Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher. *Arctic Journal*, *72*(12), 30-50.

Weibelzahl, S., & Weber, G. (2002). Advantages, opportunities and limits of empirical evaluations: Evaluating adaptive systems. *KI*, *16*(3), 17-20.

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. *Materials Horizons*, *2*(2),140-156.

A JOURNEY TO KNOWN VIRTUAL WORLD (AI)

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What is Artificial Intelligence

[1] The science and engineering of making intelligent machines specially intelligent computer system. To the similar process of using computers to understand human intelligence, but it does not confine itself to biologically observable. [2] Artificial intelligence is the past of human intelligence, there are many reason to make AI to reduce human reasoning into logical form.

History of AI

[3]Deep learning has made significant contribution to the recent progress in artificial intelligence. deep learning methods have achieved substantial improvement in various prediction tasks. AI systems become particularly essential for their user of AI and researchers and developers who create the AI solutions. [4]Artificial intelligence (AI) was born in the summer of 1956, when John McCarthy first defined the AI. It was the first time the subject caught the attention of researchers, and it was discussed at a conference at Dartmouth. In next year, the first general problem solver was tested, and one year later, McCarty regarded as the father of AI announced the LISP language for creating AI software which stands for list processing, is still used regularly today. Herbert Simon in 1965 quoted "Machines will be capable of doing any work man can do."

Growth of AI

[5] Growth of AI is done in majorly all the field such as automation skill and technologies in literature its study paste a good impact on its growth in upcoming year it will not only put an impact on the labor market but it will innovate the AI. [6] It has a great impact in all the leading companies and economical system.it has also a leading impact of competition in AI field.

AI in Healthcare Appliances

[7] There are many areas of AI in heathcare field and the most important is in medication management and drug development. [8] AI has its application in orthognathic surgery with and amazing power in image distinguished also a reaaly great impact on dento facial deformities in upcoming time [9]The latest Google Duplex Artificial Intelligence (AI) will be used as a voice-controlled speech recognition system, a personal assistant, to respond to the commands given by the person

AI in Manufacturing and Production

[10] AI technology has a great impact in manufacturing industry it have core development of the new era as internet plus AI which is great mean of change in upcoming models and ecosystems of manufacturing industry [11] Artificial Intelligence technology impact main role in modern manufacturing, particularly in the context of the Industry 4.0 paradigm. [12] AI has a great impact on production of 3D printing and GDP sector its has a great impact on environment and in many industrial process.

AI in Security and Surveillance

[13] Artificial Intelligence (AI) is used in setting surveillance camera. [14] The cyber domain represents a prominent potential usage area for AI The role of AI in the shifting threat landscape has serious implications for information security, reflecting the broader impact of AI, through bots and related systems in the information age. AI's use can both exacerbate and mitigate the effects of disinformation within an evolving information ecosystem [15] It will have a great impact on military power, strategic competition, and world politics more broadly it will become

AI in Education

[16] Importance of artificial intelligence (AI) is growing day by day, and there is no one to disagree that AI education will bring great idea in the future. Various method are being attempted to made the topic of AI clear, but students who have no experience in AI education recognize AI only as a difficult target. AI convergence education were conducted for 6th grade elementary school students, and pre and post tests were conducted in the form of AI awareness survey questionnaires which included questions such as interest in AI, changes brought by AI, and AI education.there should be level of awareness in AI education to make a great impact on student as these method are new to students many activities are being done to make this possible.

[17] In AI applications such as neural network is being used to train computer to perform tasks without human help.In these method we are applying to education. Firstly from data science we try to add AI elements to online learning environments such as Khan Academy and many other intelligent tutoring systems.From STS we provide a detailed examination of scholarly work carried out by various data scientists around the use of deep learning to known the aspect of performance and approach and relation the subjects doubts cleared and the environments setup.

[18] With practicing physicians and collaborating with the artificial intelligence(AI) with vast amount of data,sophisticated mathematical understanding is driven by the analytics of precision and personalized medicine which depend on AI to predict the particular desease in a particular patients and attributes to personalized medicine

Advantages of AI

[19] Artificial intelligence has a powerful amount in diagnosing wrong of building energy systems. The very well-known advantages and efficacies of AI make them useful in the development and management of transportation systems.basically in intelligent transportation systems, real-time sensing, detection, response, and control are of paramount importance, and AI can be utilized effectively in all of these applications.AI provides the advantages of permanency, reliability, and cost-effectiveness while also addressing uncertainty and speed in either solving a problem or reaching a decision. AI has been applied in such diverse realms as engineering, economics, linguistics, law, manufacturing and medicine, and for a variety of modeling, prediction, and decision support and control applications One of the most promising applications of AI has been its rigorous use in the Internet such as in search engines Although the efficacies of AI are significant, as with any application they are limited in both capability and functionality

[20] artificial intelligent techniques are particularly efficient. The potential applications of artificial intelligence in fashion industry cover a wide scope from design support systems to fashion recommendation systems through sensory evaluation, intelligent tracking systems, textile quality control, fashion forecasting, decision making in supply chain management or social networks and

fashion e-marketing Artificial intelligence (AI) has reached new heights in clinical cancer research in recent years. AI is applied to assist cancer diagnosis and prognosis, given its unprecedented accuracy level, which is even higher than that of general statistical expert.Artificial intelligence (AI) has reached new heights in clinical cancer research in recent years.artificial intelligence (AI), especially machine learning and deep learning, has found popular applications in clinical cancer research in recent years, cancer prediction performance has reached new heights.

[21] Artificial intelligence (AI) and machine learning (ML) can play vital role in design, modelling and automation of efficient security protocols against diverse and wide range of threats. AI and ML has already proven their effectiveness in different fields for classification, identification and automation with higher accuracy. As 5G networks' primary selling point has been higher data rates and speed, it will be difficult to tackle wide range of threats from different points using typical/traditional protective measures. Therefore, AI and ML can play central role in protecting highly data-driven softwareized and virtualized network components.

[22] Artificial intelligence-based (AI) methods have demonstrated high performance in classification, object detection, and segmentation tasks. Through multidisciplinary and collaborative work between clinicians and technicians, the advantages of AI have been successfully applied in automatic polyp detection and classification. The new AI-based systems present a better polyp detection rate and contribute to better clinical decision-making for preventing colorectal cancer (CRC).

[23] With the helps of Artificial intelligence human works can be reduce and would be replacing people by machines so humans can do other work. Programming, self assessment ,self writing etc these works are a burden on people. Artificial intelligence is like a very useful cheap labour by using Ai the work is done fast and the profit is also doubled. Artificial intelligence can be easily developed. Machines does not required refreshments and breaks as like human beings. The systems can be re programmed for work for long time without getting bored or getting tired. The science of robotics and artificial intelligence can be used into mining and other fuel exploration process by this we can save human life because human can make new robots but we cannot make human. Artificial intelligence can be used at industries and companies.

Challenges or Disadvantages of AI

[24] The application of artificial intelligence in general and specifically in the field of education contains very deep dangers that must be studied in depth. The new generations are already focused on addictive monsters that are all contained in a small hand-sized element: the cell phone; which in turn connected to the Internet makes social networks twitter, Instagram , Facebook, snap chat and others available to the individual who no longer has time to apply the maximum of Socrates: Know yourself. Current generations seem increasingly connected to their networks and technological instruments, but increasingly disconnected from their neighbours, their families and even themselves. Imaginary or virtual friends occupy a relevant place in people's lives, who spend hours updating their profiles and videos, photos and stories for others to review.It seems that we are facing the advent of a culture that worships the ego and has little to do with the truly important Artificial intelligence has had so much impact on society in general - both positive and negative - that the permanent comparison with human beings has become obsessed. In 2011 another challenge was carried out that involved artificial intelligence vs. human intelligence. It was held within the framework of one of the most famous quiz shows in the United States, there the IBM supercomputer beat the two contestants who had historically had the best performance in reality.

[25] Despite all the potential, AI solutions have not by large entered routine medical practice. In dentistry, for example, convolutional NNs have only been adopted in research settings from 2015 onwards, mainly on dental radiographs, and the first applications involving these technologies are now entering the clinical arena (Schwendicke et al. 2019). This is all the more surprising when acknowledging that dentistry is especially suited to apply AI tasks: In dentistry, imagery plays an important role and is at the cornerstone of most patients' dental voyage, from screening to treatment planning and conduct. Dentistry regularly uses different imagery materials from the same anatomical region of the sameindividual,regularly accompanied by non-imagery data like clinical records and general and dental history data, including systemic conditions, and medications. Moreover, data are often collected over multiple time points. AI is suited to integrate and cross-link these data effectively and improve diagnostics, prediction, and decision-making.Many dental conditions (caries, apical lesions, periodontal bone loss) are relatively prevalent. Building up datasets with a high number of "affected" cases can be managed with limited efforts.We see three main reasons why dentistry has not yet fully adopted AI technologies. Tackling these reasons will help to make dental AI technologies better and facilitate their uptake in clinical care.

[26]: The disadvantages of Artificial Insemination (AI) by a simple example of a experiment which was conducted in BAU(universities)poultry farm,Mymensingh, Bangladesh. Some male birds were collected from the farm and some female birds were purchased from the local villages market. Both types of birds were kept in individual cage with adhibit food and water and were given abdominal massage at least for three days (at the same time of the day) prior to AI. Collected semen was inseminated (0.20-0.25 ml/hen) directly by soft dropper into the female genital tract. The result of the present experiment showed that 1-2 females could be covered by semen collected from single ejaculate from one cock. It was also found that very small amount of semen was wastage by container. Thus it can be concluded that AI by raw semen is not profitable (except experimental point of view) until we use semen diluents for commercial purpose.

[27] The system making process are not easy as the material are very expensive it cost a huge amount of money and time rebuild,create and repair. The parts of robotic repair which people wants to fix cost huge amount of money and materials.the jobs are been replacing by robots can cause unemployment or human should find another way to generate jobs options AI cant change the government to communicate.Systems can easily cause problem if its in incorrect hands.there are consequences and fear of wrong people. AI is a specific reason for human to become lazy with its system automating the load of work.Humans land into the region were human inventions may drag to future generations.As AI is replacing the major tasks representive,other works with the helps of robots which may cause a significant problems for human interferences. Everyone around us is looking to replace a individual person with less knownledge with AI robots to do similar work with more efficiency. There are question that machines are far better when it involves working efficiently but they can't replace the humanas they creates the team. robots cannot develop a bond with humans which is an important attribute when involves Team Management. Systems can perform only those tasks which they're designed or programmed to try anything out of that they have a tendency to crash or give irrelevant outputs which might be a serious backdrop.

[28] Artificial intelligence and robotics taken to the extreme contain dangers and challenges that must be considered in all areas of their application, particularly in education. The use of robots and artificial intelligence can generate with no connection to emotions, students and teachers state that a robot is not imitable because it also lacks emotions. There were more dangers and disadvantages that were found with the indiscriminate application of robotics and artificial intelligence in education.

Conclusion

In my opinion from this research work I have a deep knowledge of artificial intelligence in upcoming time this Ai will basically be an impact on humans as it has vast power in all the field as a human can thinks work or develop something it basically can be a great help for human if it can become a powerful source of medication it will solve a huge issues of healthcare in India and around the world. Artificial intelligence can become a powerful impact to safe human life in war, factories as we can create robots but we can make human. In todays world it has a great impact on education and it can also replace the whole teaching way it would be once costly but in time it would be really cheap as one device last long. AI can be a great future for human being.

References

Abdulov, R. (2020). Artificial intelligence as an important factor of sustainable and crisisfree economic growth. Procedia Computer Science, 169, 468-472.

Benko, A., & Lányi, C. S. (2009).

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. Aayushi International Interdisciplinary Research Journal, 227-230.

Bouletreau, P., Makaremi, M., Ibrahim, B., Louvrier, A., & Sigaux, N. (2019). Artificial intelligence: applications in orthognathic surgery. Journal of stomatology, oral and maxillofacial surgery, 120(4), 347-354.

Buchmeister, B., Palcic, I., & Ojstersek, R. (2019). Artificial Intelligence in Manufacturing Companies And Broader: An Overview. DAAAM International Scientific Book.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chowdhury, M., Huang, S. Haider, N., Baig, M. Z., & Imran, M. (2020). Artificial Intelligence and Machine Learning in 5G Network Security: Opportunities, advantages, and future research trends. arXiv preprint arXiv:2007.04490.

Das, S. K., Adhikary, G. N., Islam, M. N., Paul, B. K., & Das, G. G. (2004). Artificial insemination (AI) by raw semen: Its advantages and disadvantages in Deshi chicken (Gallus domesticus). International Journal of Poultry Science, 3(10), 662-663.

Eldrandaly, K. A., Abdel-Basset, M., & Abdel-Fatah, L. (2019). PTZ-surveillance coverage based on artificial intelligence for smart cities. International Journal of Information Management, 49, 520-532.

Ganesh, D., Seshadri, G., Sokkanarayanan, S., Rajan, S., & Sathiyanarayanan, M. (2019, December). Iot-based google duplex artificial intelligence solution for elderly care. In 2019

Haugeland, J. (1989).

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., & Scharre, P. (2018). Artificial intelligence and international security. Center for a New American Security.

International Conference on contemporary Computing and Informatics (IC3I) (pp. 234-240). IEEE.

Johnson, J. (2019). Artificial intelligence & future warfare: implications for international security. Defense & Security Analysis, 35(2), 147-169

Lee, J., Lee, S., & Lee, S. (2021). The Influence of AI Convergence Education on Students' Perception of AI. *Journal of The Korean Association of Information Education*, *25*(3), 483-490.

McCarthy, J. (2007) Murali[1], N., & Sivakumaran, N. (2018).

Perrotta, C., & Selwyn, N. (2020). Deep learning goes to school: Toward a relational understanding of AI in education. *Learning, Media and Technology*, *45*(3), 251-269.

Rich, E., & Knight, K. (1991). Artificial intelligence .

Schwendicke, F. A., Samek, W., & Krois, J. (2020)

Tao, B., Díaz, V., & Guerra, Y. (2019)

Tao, B., Díaz, V., & Guerra, Y. (2019). Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher. Arctic Journal, 72(12), 30-50.

Viscaino, M., Bustos, J. T., Muñoz, P., Cheein, C. A., & Cheein, F. A. (2021). Artificial intelligence for the early detection of colorectal cancer: A comprehensive review of its advantages and misconceptions. World Journal of Gastroenterology, 27(38), 6399.

Wartman, S. A., & Combs, C. D. (2019). Reimagining medical education in the age of AI. *AMA journal of ethics*, *21*(2), 146-152.

Xu, F., Uszkoreit, H., Du, Y., Fan, W., Zhao, D., & Zhu, J. (2019, October).

Zeba, G., Dabić, M., Čičak, M., Daim, T., & Yalcin, H. (2021). Technology mining: Artificial intelligence in manufacturing. Technological Forecasting and Social Change, 171, 120971.

AN IDEA OF ARTIFICIAL INTELLIGENCE

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Introduction

In this article, the main idea of AI and the reasons for the invention of the same have been discussed. This article includes most of the aspects of introduction of AI and its main pros and cons. It discusses how AI has helped us eventually for all aspects of life such as manufacture industries, healthcare, government security, etc.AI was made to have artificially made human intelligence to solve all complex problems easily, however the early introduction has helped us a lot, but the more advancement although helpful have made a lot of problems for human and the initial creativity of our minds.

The article starts with a brief introduction of what is AI, a small definition and what is comprises of, followed an insight into the history and historical developments of AI along with the growth of AI in different fields, and its advancements which may enable robots to keep emotions and the expressions as humans. Further we see an overview of AI in health care, medical machines, industry, economical use and in education. Further we go on to the advantages of AI in our daily life and the changes it has bought and then along to the disadvantages, which is sure to come with the many advantages of AI development.

What is Artificial Intelligence?

Artificial Intelligence is the process of coming up with highly smart and advanced machine system that can mainly do efficient computer programming, so that it can work in accordance or better than human intelligence but without the barrier of biological observable methods

Artificial Intelligence is not something absurd or something that can be avoided, it is a genius idea to get work done quicker and easier with same or maybe more of intelligence than a human brain but might also harmful

History of AI

The history of AI is quite the interesting one with a lot of demonstrations and imaginations. This mainly started with the coding and invention of computers for problem solving, AI was developed in 1956 which soon caught the eye of many researchers

Further it was used the purpose making the manual processes easier and sustainable with lesser mistakes. This idea developed into the perspective of robots and to robots that can exactly copy human nature and intelligence but with more stability and efficiency, furthermore in medicinal field AI gaining a wide range of uses, such as analysing difficult algorithms. Some of the early works in AI include basic works in engineering, knowledge, In language translations etc. Mobile robots were almost unknown for 14 years after the introduction of machines. The first development in AI started from the advancements in arms and military machines.

Growth of AI

AI has grown more than anything else in the recent years or we can say that there has been an incredible development in the field of technology in the recent years.

AI was mainly developed for the better production of goods and then which increased the economic growth, now AI has been used for solving many complex logical problems and AI is now pretty much self-improving. AI is nowadays also impacting the methods of doing things.

AI is being bought up to do many of the manual tasks nowadays in the era of ever-growing technologies and it is also safe to say that it may soon replace most of human labour works, further AI is also being developed to have emotions a though humans

AI in Healthcare Appliances

AI has been proved above human intelligence in several domains now, this is a great hope for healthcare. AI allows better diagnosis, treatment, and prevention of various diseases

The main areas where AI is majorly used are for treatment of cancer, cardiology, diabetes etc.it can be used find problems in a person even if no symptoms are not shown. AI is also used as a help medium for doctors to help treat the patient quicker and easier more efficiently

The introduction of AI in the health care field has helped the advancement of prevention and treatment of diseases.

AI in Manufacturing and Production

There has been great development in the manufacturing technologies in the years, it has also bought about great change in models, methods, and economic growth, and we are also aware of the industrial revolution with AI

The involvement of AI in various manufacturing industries is increasing the transformation in models, managing systems etc. The main development that has come about is the intelligent manufacturing which brings about new change in manufacturing. AI is now involved in every step of manufacturing. it provides very low error products and saves time. There are a lot of new forms and means of AI in production and manufacturing which is supported by better computer programming

AI in Security and Surveillance

AI now also impacts the overall governance but keeping in mind the privacy laws, by giving a major support to keep a review on citizens and its borders by giving major army equipment, bust also disrupt elections give false information. it has given various models for the security of any country such as facial recognition, metal detection, iris check etc.

AI is now quite popularly used for identifying theft and bank robbery. It is not only used as surveillance cameras but also used to analyse the videos if needed. There is the use of image detection rather than sensors which help detect movement of thieves.AI surveillance UGV is a major development that has come across which reduces cost and increases the efficiency as it detects any suspicious activity in a glance using analogue transmissions, but also falling into the wrong hands can cause many problems even with security systems

AI in Education

When it comes to education we can mainly say about computer as being used as part of AI. It has used for over 20 years now, Computer based training and intelligence tutoring system are the among the first systems used to teach using AI. One main advantage is that it creates a level of explicitness about learning theories which is difficult to attain in classrooms. In the kind of system of CAI, the instructions are not individualised but scripted for a topic

The introduction of such systems has really helped the students to learn faster and better and function smarter using the technology, especially the introduction of ITS. This kind of system especially increases the performance and motivation of the students.by the introduction of AI it has also motivated the research centres. AI introduction has also made it easier to solve complex problems easily without much time taken with easier methods and has increased the reasoning ability of students. ITS was initially designed to increase and compare students' performance and better it during a task given at school

Advantages of AI

There are many advantages and improvements with the introduction and application of AI in different fields.AI is permanent, reliable, fast and cost effective.it is used in a diverse range to solve the most complex issues easily and effectively without much cost.one of the most promising feature of AI is the search engines which makes any information available at any point of time easily.

AI is used in a wide range of field, in the food industry or packaging and testing of food materials for safety most efficiently and accurately. Automobile industry for manufacturing the parts and assembly of the product without much time fast and lesser errors than human functions. The use of AI in the biology and research-medicinal departments a have increased the rate of make of medicines and the accuracy of the medicines. Economically also the use of AI has helped us to increase the overall GDP and reduced the cost of items and increased the amount produced.AI use in farming and poultry farming has also made a great difference in marketing and production. Use of AI has also decreased the chances of error and correction

Challenges or Dis-advantages of AI

Along with advantages the AI possesses a lot of disadvantages too. If we see the education side the teachers face a lot of problem due to the introduction of AI teachings mainly there I no student teacher binds or interaction necessary in schooling. Many small companies face issues and eventually must shut down as they are not able to by machines and hence lesser production and profit and not able to compete with the other huge companies. Human beings become lazy, lacks much inputs dependency increases etc.

AI although helpful and time saving has reduced the working motivation and imagination of human beings as everything is available at a click. Overall, the main disadvantages are the need for constant repair and maintenance as one small error and the entire process can be destroyed. If robots began to replace humans, then soon there might come a time when they might take over the world and human being might be the slaves, and if the robots or any software fall into the wrong hands it may cause huge destruction and terror. Still one of the main disadvantages is that the AI is not completely able think logically like human brains, it can still only perform tasks it's given instructions for and a mis command can cause huge problems.

Conclusion

AI has seen quite the development throughout the years, it has advanced to great levels of human intelligence except the part of emotion which are also being worked on into robots mainly. AI is much rapidly developing and being introduced into social domains mainly and it also leaves many people at risk. Although the introduction AI has very high use to us, but it also has its setbacks. Its being used for almost all purpose from education to health care and industries of all kind which also is reducing the available job opportunities for many, it in turn is also making the humans more dependent and lazy. But it has also increased many opportunities in the tech arena and development of many products which have helped us immensely especially the medical field for the research.

Taking in to consideration all factors I would still say that AI itself is a great boon to us humans but in the wrong hands or over usage may lead to our own destruction

References

A Benko, CS Láronyi - … of Information Science and Technology, Second …, 2009 - igi-global.com

A Kusiak - System, Prentice-Hall, Englewood Cliffs, NJ, 1990 – Springer

B Li, B Hou, W Yu, X Lu, C Yang - Frontiers of Information Technology & …, 2017 – Springe

B Tao, V Díaz, Y Guerra - Arctic Journal, 2019 - researchgate.net

B Woolf - 1991 - cs.umass.edu

Barbezat, G Wuest - Surface engineering, 1998 - Taylor & Francis

BG Buchanan - Ai Magazine, 2005 - ojs.aaai.org

CF Chien, S Dauzère-Pérès, WT Huh, YJ Jang… - 2020 - Taylor & Francis

D Quintero, FN Lee - 2019 - redbooks.ibm.com

F Filippetti, G Franceschini, C Tassoni… - IEEE transactions on …, 2000 - ieeexplore.ieee.org

J Andriessen, J Sandberg - … Journal of Artificial Intelligence in Education, 1999 – Citeseer

J Beck, M Stern, E Haugsjaa - XRDS: Crossroads, The ACM Magazine …, 1996 - dl.acm.org

J Haugeland - 1989 - books.google.com

J McCarthy - 2007 - 35.238.111.86

M Chowdhury, AW Sadek - Artificial intelligence applications to …, 2012 - onlinepubs.trb.org

M Waisi - 2020 - theseus.fi

MM Khan, S Rizwan-ul-Hasan, A Ahmed… - 2020 International …, 2020 - ieeexplore.ieee.org

N Haider, MZ Baig, M Imran - arXiv preprint arXiv:2007.04490, 2020 - arxiv.org)

N Murali[1], N Sivakumaran - 2018 - academia.edu

NA Neumann, FAC de Oliveira… - 2019 IEEE Sciences …, 2019 - ieeexplore.ieee.org

P Aghion, BF Jones, CI Jones - 2019 - degruyter.com

P Aghion, C Antonin, S Bunel - Economie et Statistique, 2019 - persee.fr

R Kakadiya, R Lemos, S Mangalan… - 2019 3rd …, 2019 - ieeexplore.ieee.org

S Feldstein - 2019 - zhizhi88.com

SK Das, GN Adhikary, MN Islam, BK Paul… - International Journal of …, 2004 - researchgate.ne

SK Das, GN Adhikary, MN Islam, BK Paul… - International Journal of …, 2004 - researchgate.net

KCA Khanzode, RD Sarode - … of Library & Information Science (IJLIS), 2020 - academia.edu

SS Osipov, NV Ulimova - SCIENCE AND WORLD, 2013 - en.scienceph.ru

V Kaul, S Enslin, SA Gross - Gastrointestinal endoscopy, 2020 – Elsevier

Weibelzahl, G Weber - KI, 2002 - academia.edu

IS ARTIFICIAL INTELLIGENCE REQUIRED?

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What is Artificial Intelligence?

[1] Artificial intelligence is the scientific process of producing intelligent machines and programs. It's a similar process of using computers to understand our intelligence but doesn't confine itself to biological observations.

[2] Artificial intelligence is a part of history of *human intelligence*, in ways that complicate mathematical accounts, which showsintelligence emerging naturally and from attempts across years to minimizethe human reasoning to anunderstandable format.

History of Artificial Intelligence

[3] The birth of artificial intelligence ismarked out to philosophy, fiction, and imagination. Preliminarycreations in electronics, engineering, and many other works have guidedartificial intelligence. Some early achievements include works in problems solving which involved basic work in learning, understanding, and reasoning as well as showing programs in language conversion and execution.

[4] The regular model for improving artificial intelligence systems concluded a fixed, known purpose that the system is needed toreduce through its actions. Systems evolved within the regularmodel that has been more successful. Regular loopholes leadthe machines harder to predict, but they will have ahuge impact on the economy and the human lives. I suppose a new version for the development of artificial intelligence in which the machine's randomness about the true objective leads to demandinglybetter modes of behaviour that are more controllable and diverse.

[5] The problems of making computers evaluate difficult problems were classified into five main areas: Search, Pattern-Recognition, Learning, Planning, and Induction. Artificial intelligence can do, what its told to do. But when not knowing how to solve a certain problem, we may program a machine to Search through some large space of solution attempts. Unfortunately, this is a inefficient process. By analysing the plan, we improve by searching a much smaller, and is more appropriate.

[6] Artificial intelligence was introduced in 1950 but there was several limitations in early creations which was the reason of prevention of artificial intelligence and was accepted world wide. The early 2000s,had a revolution as many of these limitations were solved. Now that Artificial intelligence systems are analyzing the complex algorithms .We are brought to a time where medicine can be made using artificial intelligence and can be applied to clinical practice through risk assessment models which further improves diagnostic accuracy and efficiency in the medical department. The major applications of Artificial intelligence is used in gastroenterology and endoscopy.

Growth of Artificial Intelligence

[7] Artificial Intelligence like deep learning algorithm and neural networks, are being deeply explored for healthcare applications in aspects such as imaging and diagnoses, risk analysis, lifestyle

management and analysing health information management. Knownpositives in these areas include advanced speed in imaging, and more insight into predictive screening, and reduced healthcare expenses and inefficiency.Computer based clinical tools also makea lot of problems wherein commonly-held values and moral principles may be questioned. Wecome forward with three different problematic effects of artificial intelligence e use in healthcare: (1) dynamic knowledge and opinion. (2) Liquidity and possession, and (3) privacy and unfairness. We consider their impact on patient/client, clinician, and health institution values and suggest opinionsfor their impact. We suggest that artificial intelligence -related ethical questsmight show an advantage for advancement in organizations.

[8] Artificial Intelligence is regarded to be the fourth industrial revolution. Artificial Intelligence with the use of big data has modifiedall industries around the globe. Computational systems which have programmed intelligence can execute various real-world issues far more precisely and efficiently far more than computational systems that are determined and hardcoded. Since many problems in business growth and business analytics cannot be solved by determined systems. Artificial Intelligence plays animportant role in solving problems in the outside world. Artificial Intelligenceand big data have changed the business economy and artificial intelligence is currently being used to accelerate business growth.

Artificial Intelligence in Healthcare Appliances

[9] The artificial intelligence for economic growth can be defined as the replica which is able to have human behaviour and help at the convenience of people for their benefits or a machine which is able to achieve goals which are not possible or may be tough for humans who may need a suitable environment to achieve. Artificial intelligence is able to perform increasing number of tasks which are not possible or were not previously performed by humans. Artificial intelligence may be deployed in the ordinary production for the use of their goods and services, which can potentially impacting economic growth and income shares. But artificial intelligence can also change the process by which we create new ideas and technologies for helping to solve complex problems which cannot be solved in the society and which may be needing creative effort.

[10] Artificial intelligence as competitiveness growth is a factor which is beginning to be vastly used by leading multinational companies today. Artificial intelligence is having huge potential into the national economy system is enormous and will not be limited to individual companies. It is a part of the possibility of strategic planning on the scale of the entire economy which can be helpful in many ways such as the search for accurate, optimal models of sectoral balance sheets, building target indicators for large businesses, forecasting of aggregate demand and supply, optimization of the monetary-crediting system, etc. Thus, Introduction of artificial intelligence into the economy would build a model of extended reproduction, without distortions between different sectors of the economy, and thus implement a model of its sustainable growth.

[11] Artificial intelligence is slowly changing medical practice. With recent development in digitized data possession, machine learning and computing growth, artificial intelligence programs are leading into sectorswhich were previously thought to be only the part of human experts. The breakthroughs in artificial intelligence technologies and their biomedical programs, identify the problems for further improvements in medical systems, and outline the economic, legal and social impacts of artificial intelligence in healthcare.

[12] Artificial intelligence has been improving rapidly in recent decades in respectto the software algorithms, hardware usage, and programs in a large number of areas. The latest improvements of programs of artificial intelligence in biomedicine, including disease diagnostics, biomedical analysis, and biomedical research. The target is to keep note of new scientific achievements, to develop an understandingin the possibility of technologies, to value the tremendous potential of artificial intelligence in biomedicine, and to give the related fields with inspiration.

[13] Artificial intelligence is known as a part of science and engineering known about the computational ways of intelligent behaviour, and with the formation of structures that show such behaviour. Artificial intelligencechanging into a well known field in computer science as it has changed the human life in various areas. Artificial intelligence has recently come over human development in variousareas. Artificial intelligenceis present for better prevention, detection, understanding, and treatment of illness. Major areas that use artificial intelligence tools include cancer, neurology, cardiology and diabetes. Artificial intelligence can also be useful to automate spot problems and threats for patient safety with high accuracy and speed.

Artificial Intelligence in Manufacturing and Production

[14] Modern manufacturing and logistics processes are helped by moreuniversal and strong computing networks. Oceans of data are always being created by sensors, systems, electronic gadgets, and people. Altogether with increasing computational abilities, this Big Data is being processed faster, more widely, and more thorough than ever since. These positives have redefined the quality of artificial Intelligence systems and entered a new age known as Industry 4.0. As a portion of Industry 4.0, the enormous collection of data for smart decision processing is needed for normal manufacturing processes.

[15] Based on analysis into the process of artificial intelligence technology in the production industry in a couple years, we research the fast development of core advancements in the new era which is triggering a great possibility in the models, means, and ecosystems of the processing industry, as well as in the improvement of artificial intelligence. We then propose new models, means, and forms of smart manufacturing andsmartprocessing technology system, based on the connection of artificial intelligence technology with information communications, manufacturing, and related product technology.

[16] This research uses a Distributed Artificial Intelligence (DAI) outline to usefullyexperience the infrastructure available for process planning in a batch making PWB assembly facility. The DAI approach consists the entire production control task into several sub-tasks. Then, the sub-tasks are brought by the basic elements of the DAI system called 'intelligent agents'. By working together, the intelligent systems of the DAI system can come at a solution for the problem. The DAI system firstly proposes all possible solutions made by the intelligent systems. Then, a fuzzy coordination process is utilized to qualitate the solutions and to find the most suitable one for usage. Using measures such as the short-term plan, design data, observation data, and CAD processing.

AI in Security and Surveillance

[17] On the improvement of science and technology, the collectionof the unmanned aerial vehicle and camera surveillance systems is being a promising answer for practical problems related to security and surveillance operations. The biggest problem is analysis, process, and conversion data. A certain amount of data is not being processed or transmitted. The program creates a starting background frame and changes which is sent to server. It splits the interest and then processes only the changes. This supports as there is a significant reduce in the data storage and transmission. The Advancement of the systems could be drastically reduced.

[18] Chinese technology has become an attractive for many countries who are not able to develop the technology possibleand spend for them. Some countries have relied almost entirely on China for their technologies and are those who have less human rights and are still considered less democracies. Xinjiang is not the only laboratory for these new technologies. The security patiently watches andmakes control and can be a model for governments somewhere in the globe. China's initial artificial intelligence project in Africa was anintelligent managing of its surveillance program, making sure that the government can maintain an eye on people. The facial recognition program has the power for giving the government with the knowledge about specific information of the country. Zimbabwe has looked China as a model for analysing aspects of society, including telecommunication. Legal loopholes have made it easier for China to take the data compromising safety and privacy.

[19] Beyond artificial intelligence for automatic robots which can be used for military, China has also being researching robots for decision making and using intelligent robotsfor future warfare. Operations Command Center mentioned that the artificial intelligencehas potential for combat command. China is majorly using artificial intelligence indomestic surveillance programs and are using big data to fight terrorists. Xinjiang is home to millions of Uighur who have been persecuted by artificial intelligence used by China. In the future artificial intelligence will make it impossible to commit a crime without being caught as the world will be full of it.

AI in Education

[20] Artificial intelligence is already being used in multiple schools and colleges. They are already used to track the attendance and for submission of projects in various criteria.

[21] It has been an argument that the involvement of artificial education has impacted the relationship between the students and the teachers as well as between students themselves. The Artificial intelligence has not recognised and captured education industry but may with further efforts.

[22] The Artificial intelligence may need a different way of processing as there are many ways of teaching based on the student and interest they show and can face a struggle if the same way of education is proceeded with artificial education.

Advantages of AI

[23] With the help of Artificial intelligence human works can replace people with machines and the cost of labour will be cheap with high profits where they do not need breaks and refreshments like humans. Artificial intelligence can be deployed at industries and companies and human error will not be a problem if programmed properly. Using Artificial intelligence will productively automate the tasks and free humans to be increasingly creative.

[24] The machines can be programmed for work for longer time without getting tired. Humans will have further improvement in the discovery of unexplored areas.

[25] One of the major advantages of Artificial intelligence will be that the decisions will be based on facts. Human decisions may be affected in a negative way by our emotions. Machines with Artificial intelligence do not need rest and the information can be passed through multiple systems as training will not be required. Artificial intelligence will not require creativity as when programmed by a human, it can process accordingly.

[26] Artificial intelligence is better as it's more permanent and less expensive. It can be duplicated and can perform tasks much faster than the human. The Turing test was proposed and the test involved a human interrogator who interacted with a human and with a machine and had to identify them.Artificial intelligence passed and the interrogator couldn't differentiate between human and the intelligence.

[27] The existing artificial intelligence helps in traffic signal timing based on calculations. Artificial neural networks have been introduced for traffic signal control. Reinforcement learning is a new concept in the traffic signal timing arena. A major improvement is that artificial intelligence can learn the optimal control strategy from the interactions between the control and the traffic without knowing relation between them. artificial intelligence is an exciting, dynamic research area. The improvements to artificial intelligence methods are beings additional research opportunities to all.

Challenges or Dis-advantages of AI

[28] Artificial intelligence lacks the human touch and has the ability to replace human jobs. It can malfunction and oppose of what it was programmed to do. Artificial intelligence can be misused as it can be leading to mass scale destruction and also corrupt younger generation.

[29] Artificial intelligence are not able to take decisions for certain items. Artificial intelligence can be producing wrong solutions and can lead to problems. Artificial intelligence lacks the of common sense of reasoning. Artificial intelligence in wrong hands can be dangerous. Artificial intelligence will soon start substituting humans in every field which will causing a high unemployment. This can lead to crime and poverty.

[30] Artificial intelligence is not easy to develop as the machines are expensive to create, rebuild, and repair. Artificial intelligence is making humans lazy as its automating the work which are done by humans. Machines cant have a relation with humans if they are involved in a team. They have a chance to crash or give irrelevant outputs which might be a problem.

[31] Artificial intelligence is more of a loss than gain in the society. Programs if mismatched can cause huge destruction as the processes will be changed. Younger generation get lazy. Artificial intelligence Require a lot of time and money and technological dependency would be increased.

[32] The software of artificial intelligence should be updated regularly to meet changing requirements. Artificial intelligence may have many bugs to fix. A small error can cause of a huge number of consecutive problems which can cause loss of important data. The machine will not think before acting and can enslave humans and rule the world.

Conclusion

Artificial intelligence can be really useful for humans and help in the development but also can destroy the system if in wrong hands.

References

Abdulov, R. (2020). Artificial intelligence as an important factor of sustainable and crisis-free economic growth. Procedia Computer Science, 169, 468-472.

Aghion, P., Jones, B. F., & Jones, C. I. (2019). 9. Artificial Intelligence and Economic Growth (pp. 237-290). University of Chicago Press.

Allen, G. C. (2019). Understanding China's AI strategy: Clues to Chinese strategic thinking on artificial intelligence and national security. Washington, DC: Center for a New American Security.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. Aayushi International Interdisciplinary Research Journal, 227-230.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. Ai Magazine, 26(4), 53-53.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Dick, S. (2019). Artificial intelligence.

Ghimire, A., Thapa, S., Jha, A. K., Adhikari, S., & Kumar, A. (2020, October). Accelerating business growth with big data and artificial intelligence. In 2020 Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC) (pp. 441-448). IEEE.

Guilherme, A. (2019). AI and education: the importance of teacher and student relations. AI & society, 34(1), 47-54.

Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine. Gastrointestinal endoscopy, 92(4), 807-812.

Kay, J. (2012). AI and education: grand challenges. IEEE Intelligent Systems, 27(5), 66-69.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. International Journal of Library & Information Science (IJLIS), 9(1), 3.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. Frontiers of Information Technology & Electronic Engineering, 18(1), 86-96.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education.

McCarthy, J. (2007). What is artificial intelligence?

Minsky, M. (1961). Steps toward artificial intelligence. Proceedings of the IRE, 49(1), 8-30.

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Nguyen, M. T., Truong, L. H., & Le, T. T. (2021). Video surveillance processing algorithms utilizing artificial intelligent (AI) for unmanned autonomous vehicles (UAVs). MethodsX, 8, 101472.

Osipov, S. S., & Ulimova, N. V. (2013). Advantages and Disadvantages of AI. Science and World, 77.

Pannu, A. (2015). Artificial intelligence and its application in different areas. Artificial Intelligence, 4(10), 79-84.

Racine, E., Boehlen, W., & Sample, M. (2019, September). Healthcare uses of artificial intelligence: Challenges and opportunities for growth. In Healthcare management forum (Vol. 32, No. 5, pp. 272-275). Sage CA: Los Angeles, CA: SAGE Publications.

Romaniuk, S., & Burgers, T. (2018). How China's AI Technology Exports Are Seeding Surveillance Societies Globally. The Diplomat, 18.

Rong, G., Mendez, A., Assi, E. B., Zhao, B., & Sawan, M. (2020). Artificial intelligence in healthcare: review and prediction case studies. Engineering, 6(3), 291-301.

Russell, S. (2021). The history and future of AI. Oxford Review of Economic Policy, 37(3), 509-520.

Shih, W., & Srihari, K. (1995). Distributed artificial intelligence in manufacturing systems control. Computers & Industrial Engineering, 29(1-4), 199-203.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Yu, K. H., Beam, A. L., & Kohane, I. S. (2018). Artificial intelligence in healthcare. Nature biomedical engineering, 2(10), 719-731. [7] Yu, K. H., Beam, A. L., & Kohane, I. S. (2018). Artificial intelligence in healthcare. Nature biomedical engineering, 2(10), 719-731.

ARTIFICIAL INTELLIGENCE AND IT'S APPLICATIONS

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What Is Artificial Intelligence?

[1] Artificial intelligence is used to solve complex problems. AI is created using technologies ofcomputer science and physiology intelligence.[2] Artificial intelligence is not restricted to anynatural phenomenon. The goal of artificial intelligence research is to build a better machinewhich can understand emotions and can work more accurately.

History of AI

[3] Artificial intelligence was myth and stories to everyone. But first one to discover AI was classical philosophers who wanted to describe the process of human thinking into symbols.

Scientists begin with this ideology and they begin to discussing the possibility of electronic brain. The field of AI research started in campus of Dartmouth college during 1956.At first respond ofAI technology wasn't successful and even scientist had faced many difficulties. Because ofconstant pressure from government AI research was stopped. After seven years Japanesegovernment started research of AI through inspiring industry and government.

[4]AI were neverrestricted to single field it even research of AI in medicine started recently. At first there were somany difficulties but in early 200s, many of those limitations were overcome because of deep learning now AI system is capable to solve complex algorithms and codes. Major applications of

AI which are used in medical are in gastroenterology and endoscopy.[5] IEEE Annals of the History of Computing, 1996 - ieeexplore.ieee.org

Over the course of history, women have slowly begun to hold influential roles in the computing industry. Although progress has been made, the precipitous journey is not yet …

Key developments in the history of artificial intelligence are described in terms of a model of gender (Man of Reason), drawn from the work of philosopher Genevieve Lloyd. Women's studies and computer science both evolved as academic disciplines in the 1960s, but they evolved along very different paths.

[6] Although achieving full- blown artificial intelligent blown artificial intelligence remains in future, we must maintain the ongoing dialogue about the implications of realizing the promise. Philosophers have floated the possibility of intelligent machines as a literary device to

Help us define what it means to be human. René Descartes, for example, seems to have been more interested in "mechanical man" as a metaphor than as a possibility. Gottfried Wil-helm Leibniz, on the other hand, seemed to see the possibility of mechanical reasoning devices

Using rules of logic to settle disputes. Robots, and artificially created beings such as the Golem in Jewish tradition and Mary Shelly's Frankenstein, have always captured the public's imagination, in part by playing on our fears. Mechanical animals and dolls—including a mechanical trumpeter for which Ludwig van Beethoven wrote a fanfare—were actually built from clockwork mechanisms in the seven-tenth century. Although they were Obviously limited in their performance and were intended more as curiosities than as demonstrations of thinking, they provided some initial credibility to mechanistic views of behavior and to the idea that such behavior need not be feared. As the industrial world became more mechanized, machinery became more sophisticated.

Growth of AI

[7] Role of Artificial intelligence in business is huge.AI is not only in demand because its humanabilities. But when compared to human it can complete work or algorithm in minimum time and more accurately.[8]AI based clinical tools are also developing to control manydifficulties such as unavailability of organs such as brain heart. Many of the projects of curinghuman problems such as handicaps and all. Huge project of test tube baby uses principles of AIThis all of the things are possible because of AI. It's how AI is demanding and needed to society.[9] Artificial Intelligence (AI) is considered to be the fourth industrial revolution. Artificial Intelligence with the help of big data has transformed all industries around the world Artificial intelligence refers to the simulation of human or animal intelligence in computational systems so that they are programmed to think like Intelligent beings and mimic the actions of intelligent entities. Computational systems which have programmed intelligence can solve different real-world problems far more accurately and efficiently than computational systems that are deterministic and hardcoded. Since many problems in business and business analytics cannot be solved by deterministic systems, AI plays a major role in tackling problems in the business world Machine learning and deep learning which are subsets of the field of AI is widely used to solve and optimize many problems in business such as marketing, credit card fraud detection, algorithmic trading, customer service, portfolio management, product recommendation according to the needs of customers, insurance underwriting. AI and big data have revolutionized the business world and this paper discusses some AI and big data technologies that are currently being used to accelerate business growth.[10] Artificial intelligence as a factor of competitiveness growth is beginning to be widely used by leading companies today. The potential for introduction of artificial intelligence into the national economy system is enormous and cannot be limited to individual companies. First of all, it is the possibility of strategic planning on the scale of the entire economy, that is, the search for optimal models of sectoral balance sheets, building target indicators for large businesses, forecasting of aggregate demand and supply, optimization of the monetary-crediting system, etc. Thus, introduction of strategic planning based on artificial intelligence into the national economy system, would build a model of extended reproduction, without distortions between different sectors of the economy, and thus implement a model of its sustainable, crisis-free growth.

Applications of AI in Health Care

[11] Big data technology is part of AI and nowadays big data used as fundamental unit ofbiomedical and health care research. It is hectic to store large amount of data in the files andthat's why big data technology is used. You can store data in large scale and even you can find itin minutes. Big data application provides cloud system which gives you space to protect you filesand information in particular way to do you work more easily. [12] Application such as machinelearning is brain for health care. With the help of machine learning Doctors got advance technology which helps them in their complex operations. Which are like robotics hand, roboticslegs, robotics brain and heart. Even operations like dialysis, heart transplantation, organtransplantation done using machines. There is no restriction of using AI as a cure to humanbeings it is working really abnormally and helping us. Machine learning and big data was theapplications of first three types in AI and the fourth type of AI used in health care is living assistant. This application is really worth and useful for older and disable peoples.Whichthe help of this application many peoples. [13]AI techniques are also being applied to the costly problem of dosage errors—where our endings suggest AI could generate $16

billion in savings. In 2016, a ground breaking trial in California found that a mathematical formula developed with the help of AI had correctly determined the correct dose of immunosuppressant drugs to administer to organ patients. Determining the dose has traditionally depended on a combination of guidelines and educated guesswork—and dosing errors make up 37% of all preventable medical errors. While this type of AI technique is nascent, the example is powerful considering that the correct dose is critical to making sure a graft is not rejected after an organ transplant. Using AI to aid clinical judgement or diagnosis still remains in its infancy, but some results are emerging to illustrate the possibility. In 2017, a group at Stanford University tested an AI algorithm against 21 dermatologists on its ability to identify skin cancers. The clinical •endings, as reported by Nature last year, "achieve performance on par with all tested experts …demonstrating an artificial intelligence capable of classifying skin cancer with a level of competence comparable to dermatologists." Our •endings suggest AI could yield $5 billion in annual savings by doing a preliminary diagnosis before a patient enters the emergency department.

[14] AI also holds promise for helping the health care industry manage costly back-o€ce problems. Activities that have nothing to do with patient care consume over half (51%) of a nurse's workload and nearly a fit (16%) of physician activities.

Technologies, such as voice-to-text transcription, can improve administrative workflows and eliminate time-consuming non-patient-care activities, such as writing chart notes, ling prescriptions, and ordering tests. We estimate that these applications could save the industry $18 billion annually.

AI in Manufacturing and Production

[15] There is rapid growth of AI in manufacturing and production. It is era of 'internet plus AI'Which shows everything is possible with the help of AI. It includes design, Production, management, testing and integration. There are unique patterns to work in production through AI. There are five types of manufacturing system technology which are general technology, intelligent manufacturingplatform technology, ubiquitous network technology, product life cycle intelligentmanufacturing technology and supporting technology.

[16] AI applications notonly for manufacturing but also useful for distribution. It overcomes the stress of distributionand overcome the mistakes done during distribution. It finds appropriate solution for problemsduring any distribution. It works on CAD information. [17] It is used because it provides truevalue and paper work which is really important for factories. It utilizes all process like planningand control, predictive maintenance, quality control, with the help of situ process andoptimization with provides all products more efficiently. [18] The traditional production paradigm of large batch production does not offer flexibility toward satisfying the requirements of individual customers. A new generation of smart factories is expected to support new multi variety and small-batch customized production modes. For this, artificial intelligence (AI) is enabling higher value-added manufacturing by accelerating the integration of manufacturing and information communication technologies, including computing, communication, and control. The characteristics of a customized smart factory are: self-perception, operations optimization, dynamic reconfiguration, and intelligent decision-making. The AI technologies will allow manufacturing systems to perceive the environment, adapt to the external needs, and extract the process knowledge, including business models, such as intelligent production, networked collaboration, and extended service models. This article focuses on the implementation of AI in customized manufacturing (CM). The architecture of an AI-driven customized smart factory is presented. Details of intelligent

manufacturing devices, intelligent information interaction, and construction of a flexible manufacturing line are showcased. The state-of-the-art AI technologies of potential use in CM, that is, machine learning, multi agent systems, Internet of Things, big data, and cloud-edge computing, are surveyed. The AI-enabled technologies in a customized smart factory are validated with a case study of customized packaging. The experimental results have demonstrated that the AI-assisted CM offers the possibility of higher production flexibility and efficiency. Challenges and solutions related to AI in CM are also discussed.

AI in Security and Surveillance

[19] The aim of researches was to save peoples from fake calls and fake companies that's whythey created cyber security it was not bounded to particular topic it was help for every problemsuch as harassing illegal videos and all with the help of AI and cyber security we can getinformation about geographical area, sample size. With the help of AI many wars were able toavoid. It is useful for army. They can make sure where is terrorist they can easily check contactand illegal sites. [20] it is used as information superiority. With the help of artificial intelligencepeople can predict the bomb inside the car with the help of underside vehicle bomb detection.Most useful and easily available device is security cameras which can easily predict the thief iteven works on internet and you can access it through anywhere. Military reconnaissance thisare especially called as drones this are perfect source for security it can work as bothtransportation and watching it is easier to use and most helpful for military. Border control liedetector is the is the device to check person is lying or not. As many of devices are invented touse and it really protects your security.[21] Strategic studies deals intimately with the topic of power. Most scholars in the discipline work with a concept of power as an adversarial zero-sum competition. This is natural and necessary. However, other conceptions of power developed within political science and sociology could enrich strategic studies. Approaching two typical, traditional tasks of strategy – alliance building and war-fighting – this article demonstrates the heuristic mileage of theories of collective power. In particular, we can shed new light on the post-Cold War transformation of NATO as well as state-building as a strategy in counter-insurgencies with new ideas of power. Broadening the palette of theories of power is thus valuable if strategic studies are to prosper as an independent field of study. Recent developments in artificial intelligence (AI) suggest that this emerging technology will have a deterministic and potentially transformative influence on military power, strategic competition, and world politics more broadly. After the initial surge of broad speculation in the literature related to AI this article provides some much needed specificity to the debate. It argues that left unchecked the uncertainties and vulnerabilities created by the rapid proliferation and diffusion of AI could become a major potential source of instability and great power strategic rivalry. The article identifies several AI-related innovations and technological developments that will likely have genuine consequences for military applications from a tactical battlefield perspective to the strategic level.

AI in Education

[22] Artificial Intelligence is a growing technology capable of altering every aspect of our social life. In education, AI has begun producing new teaching and learning solutions that are now undergoing testing in different contexts.[23] The field of Artificial Intelligence in Education (AIED) has undergone significantdevelopments over the last twenty-five years.[24] The teaching of artificial intelligence (AI) topics in schools is important globally to educate the next generation. Also,the

application of artificial intelligence in early teaching resulted in the intelligent teaching system.[25]Though only a dream a while ago, artificial intelligence (AI) has become a reality, being now part of our routines and penetrating every aspect of our lives, including education. It is still a field in its infancy, but as time progresses, we will witness how AI evolves and explore its untapped potential. Against this background, this chapter examines current insights and future perspectives of AI in various contexts, such as natural language processing (NLP), machine learning, and deep learning. For this purpose, social network analysis (SNA) is used as a guide for the interpretation of the key concepts in AI research from an educational perspective. The research identified three broad themes: (1) adaptive learning, personalization and learning styles, (2) expert systems and intelligent tutoring systems, and (3) AI as a future component of educational processes. AI, as a broad and advanced term for computer intelligence, started to be discussed between the 1950s and 1980s, which was followed by the introduction of Machine Learning technology between the 1980s and 2010, where learning through algorithms was brought to the agenda, and finally, after 2010, Deep Learning emerged as a breakthrough technique for implementing Machine Learning via neural networks to complete tremendously complex thinking tasks. In this context, the following sections examine the two vital technologies of machine learning and deep learning to better comprehend and explore the world of AI.

Advantages of AI

[26]AI can do stressful and complex work that humans may struggle are may not be able to do. [27]AI applications can be utilized in making decisions or solving any problems.

[28] The decisions of AI are based on facts rather than emotions. Even after our utmost efforts, it is a well-known fact that human decisions are always affected in a negative way by our emotions.[29]AI has showed powerful capacity in detecting and diagnosing faults of building energy systems as it is built based on fault detection and diagnosis (FDD). [30]AI is modernly approached as it covers the design and development of multiagent and distributed AI systems.

Challenges or Disadvantages of AI

[31] AI is getting into our everyday lives as a challenge such as capabilities in driving, finding a job, controlling our lives etc.... [32] The new adoption of Artificial Intelligence (AI) in the public sector is opposed in many ways, but while there is increasing speculation about both its dangers and its benefits. [33] It sometimes can be misused leading to mass scale destruction may require a lot of time and money, also leads to increase in Technological dependency.[34]AI could counter the risks of bias in algorithm development and issues related to data sharing, storage etc.... [35] AI comes with the risks of cyberattacks and nowadays hackers tend to take advantage over digital life. [36] AI is replacing the majority of the repetitive tasks and other works with robots human interference is becoming less which may cause a significant problem within the utilization standards. Every organization is looking to exchange the minimum qualified individuals with AI robots which may do similar work whichalso leads to unemployment. [37] We have been living with the basic formalizations made by McCulloch and Pitts (1943) for over fifty years now. Their formalization included that the activity of the neuron is an \all-or-none" process, that a certain led number of synapses must be excited within the period of latent addition in order to excite a neuron at any time, and this number is independent of the synapses' previous activity and position on the neuron, that the only significant delay within the nervous system is synaptic delay, that the activity of any inhibitory synapse absolutely prevents excitation of the neuron at that time, and that the structure of the net

does not change with time. With the addition of changing synaptic weights by Hebb (1949) we pretty much have the modern computational model of neurons used by most researchers. [38] With 50 years of additional neuroscience, we now know that there is much more to real neurons. Can newer models provide us with new computational tools, and will they lead to new insights to challenge the learning capabilities that we see in biological learning. Over time we become trapped in our shared visions of appropriate ways to tackle problems, and even more trapped by our funding sources where we must constantly justify ourselves by making incremental progress. Sometimes it is worthwhile stepping back and taking an entirely new (or perhaps very old) look at some problems and to think about solving them in new ways. This takes courage as we may be leading ourselves into aren't sorts of solutions that will for many years have poorer performance than existing solutions. With years of perseverance, we may be able to overcome initial problems with the new approaches and eventually leapfrog to better performance. Or we may turn out to be totally wrong. That is where the courage comes in.

Conclusion

In my opinion Artificial Intelligence would play a key role in many fields which would

Make work easier. It has been successful in many fields and will be promoted in many other Fields too. Though it has some disadvantages but still gives us more benefit.

References

Abdulov, Rafael. "Artificial intelligence as an important factor of sustainable and crisis-free economic growth." *Procedia Computer Science* 169 (2020): 468-472.

Adam, Alison. "Constructions of gender in the history of artificial intelligence." *IEEE Annals of the History of Computing* 18, no. 3 (1996): 47-53. Goyal, Amita. "Women in computing: historical roles, the perpetual glass ceiling, and current opportunities." *IEEE Annals of the History of Computing* 18, no. 3 (1996): 36-42. Estrin, Thelma. "Women's studies and computer science: Their intersection." *IEEE Annals of the History of Computing* 18, no. 3 (1996): 43-46.

Adams, Julie A. "Multiagent systems: A modern approach to distributed artificial intelligence." AI Magazine 22, no. 2 (2001): 105-105.

Aghion, P., Jones, B. & Jones, C. I. (2019). 9. Artificial Intelligence and Economic Growth (pp. 237-290). University of Chicago Press.

Alhayani, B., Mohammed, H. J., Chaloob, I. Z., & Ahmed, J. S. (2021). Effectiveness of artificial intelligence techniques against cyber security risks apply of IT industry. Materials Today: Proceedings.

Benko, A., &Lányi, C. S. (2009). History of artificial intelligence. In the Encyclopedia of Information Science and Technology, Second Edition (pp. 1759-1762). IGI Global.

Bhbosale, S., V. Pujari, and Z. Multani. "Advantages And Disadvantages Of Artificial Intellegence." Aayushi International Interdisciplinary Research Journal (2020): 227-230.

Buchanan, Bruce G. "A (very) brief history of artificial intelligence." *Ai Magazine* 26, no. 4 (2005): 53-53.

Charniak, E. (1985). Introduction to artificial intelligence. Pearson Education India.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chiu, Thomas KF, and Ching-sing Chai. "Sustainable curriculum planning for artificial intelligence education: A self-determination theory perspective." Sustainability 12, no. 14 (2020): 5568.Hu, Yanrong, and Zineng Liao. "Design of Knowledge Base and Curriculum Planning Based on Artificial Intelligence Teaching System." In Proceedings of the 2020 International Conference on Computers, Information Processing and Advanced Education, pp. 327-330. 2020.

Chowdhury, Mashrur, and Adel W. Sadek. "Advantages and limitations of artificial intelligence." Artificial intelligence applications to critical transportation issues 6, no. 3 (2012): 360-375.

Ghimire, Awishkar, Surendrabikram Thapa, Avinash Kumar Jha, Surabhi Adhikari, and Ankit Kumar. "Accelerating business growth with big data and artificial intelligence." In *2020 Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC)*, pp. 441-448. IEEE, 2020.

Goksel, Nil, and Aras Bozkurt. "Artificial intelligence in education: Current insights and future perspectives." In *Handbook of Research on Learning in the Age of Transhumanism*, pp. 224-236. IGI Global, 2019.

Haugeland, J. (1989). Artificial intelligence: The very idea. MIT press.

Johnson, James. "Artificial intelligence & future warfare: implications for international security." *Defense & Security Analysis* 35, no. 2 (2019): 147-169.

Kalis, Brian, Matt Collier "10 promising AI applications in health care." *Harvard Business Review* (2018).

Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine. Gastrointestinal endoscopy, 92(4), 807-812.

Khanzode, Ku Chhaya A., and Ravindra D. Sarode. "Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review." International Journal of Library & Information Science (IJLIS) 9, no. 1 (2020): 3.

Kiener, Maximilian. "Artificial intelligence in medicine and the disclosure of risks." Ai & Society (2020): 1-9.

Li, B. H., Hou, B. C.,Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. Frontiers of Information Technology & Electronic Engineering, 18(1), 86-96

Luo, J.,Wu, M., Gopukumar, D., & Zhao, Y. (2016). Big data application in biomedical research and health care: a literature review. Biomedical informatics insights, 8, BII-S31559.

Mogali, Shivaranjini. "Artificial Intelligence and its applications in Libraries." In Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi. 2014.

Nils J. Nilsson. "Challenge problems for artificial intelligence." In *Proceedings of the National Conference on Artificial Intelligence*, pp. 1340-1345. 1996.

Panch, Trishan, Heather Mattie, and Rifat Atun. "Artificial intelligence and algorithmic bias: implications for health systems." Journal of global health 9, no. 2 (2019) and Moore, Phoebe V. "OSH and the future of work: benefits and risks of artificial intelligence tools in workplaces." In International Conference on Human-Computer Interaction, pp. 292-315. Springer, Cham, 2019.

Pedro, Francesc, Miguel Subosa, Axel Rivas, and Paula Valverde. "Artificial intelligence in education: Challenges and opportunities for sustainable development." (2019).

Perc, Matjaž, Mahmut Ozer, and JanjaHojnik. "Social and juristic challenges of artificial intelligence." Palgrave Communications 5, no. 1 (2019): 1-7.

Racine, E., Boehlen, W., & Sample, M. (2019, September). Healthcare uses of artificial intelligence: Challenges and opportunities for growth. In Healthcare management forum (Vol. 32, No. 5, pp. 272-275). Sage CA: Los Angeles, CA: SAGE Publications.

Richard Fu "10 promising AI applications in health care." *Harvard Business Review* (2018).

Roll, Ido, and Ruth Wylie. "Evolution and revolution in artificial intelligence in education." International Journal of Artificial Intelligence in Education 26, no. 2 (2016): 582-599.

Rong, G., Mendez, A., Assi, E. B., Zhao, B., &Sawan, M. (2020). Artificial intelligence in healthcare: review and prediction case studies. Engineering, 6(3), 291-301.

Selman, Bart, Rodney A. Brooks, Thomas Dean, Eric Horvitz, Tom M. Mitchell

Shih, W., & Srihari, K. (1995). Distributed artificial intelligence in manufacturing systems control. Computers & Industrial Engineering, 29(1-4), 199-203.

Strong, A. I. "Applications of artificial intelligence & associated technologies." Science [ETEBMS-2016] 5, no. 6 (2016).

Sun, Tara Qian, and Rony Medaglia. "Mapping the challenges of Artificial Intelligence in the public sector: Evidence from public healthcare." Government Information Quarterly 36, no. 2 (2019): 368-383.

Tadapaneni, N. R. (2020). Artificial Intelligence Security and Its Countermeasures. International Journal of Advanced Research in Computer Science & Technology, 8(1).

Wan, Jiafu, Xiaomin Li, Hong-Ning Dai, Andrew Kusiak, Miguel Martínez-García, and Di Li. "Artificial-intelligence-driven customized manufacturing factory: key technologies, applications, and challenges." *Proceedings of the IEEE* 109, no. 4 (2020): 377-398.

Zhao, Yang, Tingting Li, Xuejun Zhang, and Chaobo Zhang. "Artificial intelligence-based fault detection and diagnosis methods for building energy systems: Advantages, challenges and the future." Renewable and Sustainable Energy Reviews 109 (2019): 85-101.

ARTIFICIAL INTELLIGENCE: A HUMAN FRIEND OR EVIL

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What is Artificial Intelligence?

[1]It is field of science and technology which make computerised program that help to make human life more efficient. It alsodoes not need to undergo any method which is biologically observable.

[2]Computational method used to study human behaviour and helps to make their life more productive is known as the artificial intelligence.

[3] Computer programed devices or machine which helps people in their daily life to do day to day life work. For example nowadays people use robotic home cleaner in their house. It helps to clean the house in a proper way and more fast.

History of the Artificial Intelligence

[4]In early times artificial intelligence was only thought is friction and imagination, but as the time passed some basic invitation in field of engineering and electronic items lead to the influence of the artificial intelligence. Artificial intelligence also got a boost when people started to learn basic programming and started to imply in their life resulted a positive impact in people life.

[5] Twenty years ago everyone was not familiar with the benefits of artificial intelligence and their application. So they were not able to implyin their dailylife. For example everyone did not have an android phone twenty years ago, whereas today most of people have android phone now a days. With the flow of time there are modification and new technology introduced in the mobile phone such as biometrics lock, water resistance, etc. which was beyond imagination few years back.

[6] Nowadays artificial intelligence has become a must for all kind of people living in modern society which was an only an imagination few years before. It has helped the world in many field and leads to many new innovations and applied in practical life. Expert believes that artificial intelligence is becoming self depend and improving day by day with new innovation and implementation in world.

[7] All the companies irrespective of any small or large scale industry started to implement the use of artificial intelligence. Artificial intelligence solves many problem of the industrialist by cut-off the labour charges and expenses and it also help to increase the productivity and maintain quality of the finished product. Therefore introduction to the artificial intelligence have a positive as well as negative impact in society.

[8] Artificial intelligence has helped to solve and learn many activities and project irrespective of any field. It has turned out be excellent at discovering new ideas and are applicable in domain of business, science and government. With the introduction of computer, data can be stored in more organized manner and can be accessed by anyone who has accessibility from any part of world at any point of time.

Artificial Intelligence in India

[9] Artificial intelligence played a key role to uplift the development in country. With the flow of time India has used the artificial intelligence technology efficiently to become more productive and efficient.

[10]In the last twenty years there has a huge implementation of the artificial intelligence in India. In recent times out of ten people around eight people use artificial intelligence device.

[11]We know that farming is one the most common work which people of India do for their living directly or indirectly. Artificial intelligence played a vital role in field of agriculture. With the application of the harvesting machine now a farmer can harvest more quickly compared to that what he did manually. Different method and Artificial intelligence machine have helped in irrigation process to make it faster and efficient. Governmentmust play an important role here to provide with all facilities and satisfy all the need which farmers need to use an AI machine.

[12] Indian government also has lot of implementation or use AI in a huge scale. Government uses AI technology or devices to keep old records of data. This data can be accessed at any time or can be used for future strategic planning.

[13] Indian Space Research Organization (ISRO) is space explorer agency of India, has also played an important role in growth of artificial intelligence in India. Satellite launched by ISRO help us in our day to day life. For example, we can fetch any live casting which happens in any part of world.

[14]It is fact that with AI has a positive impact in India but it is also true that it also have same percentage of negative impact in India. There are many cybercrime which are happening with the common people. Some of the cybercrime are phishing, hacking, cookies, malware, etc.

[15] Electronic mode of payment has become a common thing or a practice in India. But there are many people who are not able to use or apply it. This is one of the main reasons India cannot totally depend on electronic mode of payment or on Artificial intelligence technologies or machines.

[16]Till now many old age people or old generation people are not that good with the AI machines which is a major drawback in India. Due to this reason we cannot fully depend on the AI system.

[17] AI technology has helped industrialist or a business man a lot, but it also resulted in unemployment of lower and middle class family who directly or indirectly depend on industry for their income. It has resulted is increase in starvation rate in country.

[18]In future, India will have more application of AI system. There are many projects going on India which will uplift the AI usage. For example Bullet train will reduce the time of journey between Mumbai and Ahmedabad.

Artificial Intelligence in Healthcare Appliances

[19] There is a great impact of artificial intelligence in field of healthcare with pass of time which resulted in reduction of work load of doctors and nurses.

[20] Many type of sensor are introduced and used in medical fieldwith introduction of AI technology. For example tactile sensor based e-skin is the artificial intelligence device used for complex characteristics of human skin.

[21] Interactive robots are also used in healthcare with the help computer and program which keep a track on the patients' health status and also help in diagnose with illness which a patient is suffering from.

[22] Robotics system is used for high accuracy task which is not possible for humans. With help of AI devices now operation can be done with more faster and percentage of error in less as they are more accurate.

[23]Now a day's doctor doesn't have to remember each and every data which usually doctor did twenty years ago. Artificial intelligence has also help doctors, nurses to reduce their mental pressure and helps to do high risk jobs more accurate related to patients health. It also help staff to take decision more precisely and accurate with less percentage of error.

[24] With application of AI, now a person who lost their body parts can again get back them in form of artificial part which mainly solve the problem.

[25] In last few years there has been a positive growth of artificial intelligence in field of healthcare. There are many project which are under construction, when it will develop it would have more implementation of artificial intelligence. As per report or research of expert, artificial intelligence devices or technology can completely take over the work of doctors in upcoming decades.

[26] In this modern world mobile phone are also considered as a mini hospital and are used it emergency. There are many application which are been used for medical purpose.

[27] With the development of artificial intelligence and withits application pharmaceutical companies can now manufacture huge number of medicines and medical related stuff at faster rate compared to before application of AI technology.

Artificial Intelligence in Manufacturing and Production

[28]. Computer network and artificial intelligence has positive and powerful impact in revolution of manufacturing and production industry. With the wide availability of artificial intelligence product like sensors, smart devices, machine productivity has increased in recent time. Industrialist and business man has showed their interest in AI technology. With the use of artificial intelligence, product are analysed faster, more deeply and broadly which help a company or an industry for a long run.

[29] With introduction of the artificial intelligence efficiency, quality and quantity of the product has increased. It also provided with cost-effective and environment friendly. These all resulted high competition of manufacturing enterprise or group in market.

[30] Many manufacturing industries depend on robots for their development of product. Automobile industry was one of the first industry sectors to implement use of artificial technology. Robots are used for manufacturing of car, its part and also used to assembly the automobile.

[31] Smartphone manufacturing industries have high impact of artificial intelligence technology. Every now and then a new feature is added to smartphone which was an imagination twenty years back. Biometrics lock, camera, water resistance and etc. are some of the feature. In this modern world smartphone is considered as a second heart for human being. Many soft wares, applications help person in their daily life. Social media also help people to connect from different part of world to learn their culture and also used for entertainment of people.

[32] Artificial intelligence is used also in designing the environment cost control of manufacturing sector.

Artificial intelligence in Security and Surveillance

[33] Artificial intelligence plays a crucial role in security and surveillance. In the recent times many new technology are used for security and surveillance purpose. It has helped many countries with increase their security and safety.

[34] IT has made it possible to detect any deceptive identities and any unusual activity with help of computerized programed machines or software. By using artificial intelligence one can easily keep surveillance and get critical alerts for any unusual activity and prevent any attack or crime.

[35] All the countries military forces have started to implement use of artificial intelligence. They started to include many robotics and autonomous system for strength their forces. Artificial intelligence will help them to do difficult task with less percentage of risk. They even use satellite technology to keep a watch on enemy which was not possible few years back.

[36] Artificial intelligence has a great impact on military application for a tactical battlefield on view of strategic level. Many countries are manufacturing robots and use them in security of nation with providing them proper guidance and training.

[37] Artificial intelligence also resulted in revolution of gun and missile with flow of time. Many technologies and advance system are used to manufacture these missiles. Missile also equipped with advance technology. Laser guided missile is one of the advance technology missile used by different country for their security. Rader is also an artificial intelligence technology which is used for many different purposes. It is used to keep an eye on enemy aircraft and even track on their aircraft.

[38] Drone is also becoming an important part in security of a country. It helps to keep an eye on enemy and keep a track on enemy activities.

[39] As we know that there are many positive effect of using artificial intelligence but there are many negative impact also in field of security. Experts believe that any country should not totally depend on artificial intelligence technology for their security purpose. There may be malfunction of artificial intelligence devices which may lead to serious issues. There may be cases of stealing data or confidential resources which is not a good thing for any country.

AI in Education

[40] In the last twenty years education system has got a boost or has been influenced with artificial intelligence technology and devices or machines. Now a day's artificial intelligence play a great role in every student's life for collecting information and for other purposes.

[41] Artificial intelligence has main concern with the development of the human teaching technique. Its main concern is with the human teaching process and what improvement can be done in process. Now day's artificial intelligence devices are used to explore and evaluate a student with more attention. With help of artificial intelligence technology a student can be evaluated or monitored closely in details and it could help student to understand where he or she is lagging or what their weakness are,according to which a student can work for his or her improvement.

[42] With the help of artificial intelligence now student can connect to different form of cultures and diversities easily. They can learn different kind of language and cultural tradition. Nowadays eBooks are becoming very popular day by day. Many students have started to use eBooks which solves many problems for a student.

[43] Teacher uses artificial intelligence devices such as smart board, uses small video clips for teaching which is more effective for a student to understand. With help of artificial intelligence devices work load of a teacher has reduced.

[44] We know that artificial intelligence has helped a lot to student as well as teachers in field of education but there is also a negative impact as well. Student completely depends on artificial intelligence technology for everything, instead of putting any effort from them. They also use different type of malpractices in exam with help of artificial intelligence devices.

What are the Advantages of Artificial Intelligence?

[45] Artificial intelligence devices can work continuously and it do not require break or it don't feel tired with human feels. They are ready to work whenever you want them to work.

[46] The error percentage for the artificial intelligence devices are is very nominal compared to human work. Due to that reason it is used to do the risky jobs or it helps us to in high precaution activity.

[47] With the help of the AI, industry gets a boost to increase the production multiple times. For example in coin manufacturing industry, they use engraving machine nowadays to grave on coin. This artificial intelligence machine resulted in increase in production and maintains quality.

[48] AI plays a vital role to take a discussion for a company in a long term run by providing information in structured well managed way. It results in making of product output more efficient, faster and help to maintain quality.

[49] Artificial intelligence now can be used to spread knowledge. If an artificial device is ready with knowledge, it can be used to spread knowledge which saves a lot of time.

What are Disadvantages of the Artificial Intelligence?

[50] AI is also dangerous and can cause a negative impact in society if it is not used wisely or properly.

[51] AI devices may have some error in execution, opposite to command given by the user which may even lead to a disaster.

[52] Employment of the employees is getting affected both directly and indirectly which could affect economic of country.

[53] Manufacturing and installation of the AI devices are highly expensive. For repair and installation it completely depends on human resources.

[54] AI can only perform those question or tasks which are programmed to do. User may sometimes face crash or unwanted output which is backdrop.

Conclusion

Artificial Intelligence has played an important role in every aspect and field. There are many good as well as negative effect of artificial intelligence in society. So, it is up to us what way or how we take or make best use of it. There may be lot of challenges faced in future during more application of artificial intelligence technology. As per my opinion artificial intelligence is both friend as well as evil. It depend on you how you deal with it.

References

Abdulov, R. (2020). Artificial intelligence as an important factor of sustainable and crisis-free economic growth. *Procedia Computer Science*, *169*, 468-472.

Aghion, P., Jones, B. F., & Jones, C. I. (2019). *9. Artificial Intelligence and Economic Growth* (pp. 237-290). University of Chicago Press.

Agrawal, A., McHale, J., & Oettl, A. (2019). *5. Finding Needles in Haystacks: Artificial Intelligence and Recombinant Growth* (pp. 149-174). University of Chicago Press.

Beck, J., Stern, M., & Haugsjaa, E. (1996). Applications of AI in Education. *XRDS: Crossroads, The ACM Magazine for Students*, *3*(1), 11-15.

Benko, A., & Lányi, C. S. (2009).History of artificial intelligence.In *Encyclopedia of Information Science and Technology, Second Edition* (pp. 1759-1762).IGI Global.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intelligence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Charniak, E. (1985). *Introduction to artificial intelligence*. Pearson Education India

Chen, H., & Wang, F. Y. (2005). Guest editors' introduction: Artificial intelligence for homeland security. *IEEE intelligent systems*, *20*(5), 12-16.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

Chen, M., Liu, Q., Huang, S., & Dang, C. (2020). Environmental cost control system of manufacturing enterprises using artificial intelligence based on value chain of circular economy. *Enterprise Information Systems*, 1-20.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Gabriel, I. (2020). Artificial intelligence, values, and alignment. *Minds and machines*, *30*(3), 411-437.

Guo, M. Advantages And Disadvantages Of Artificial Intelligence In Business English Teaching.

Han, L. (2018). Analysis of new advances in the application of artificial intelligence to education. *Advances in Social Science, Education and Humanities Research*, (220), 608-611.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., &Scharre, P. (2018). *Artificial intelligence and international security*.Center for a New American Security.

Johnson, J. (2019). Artificial intelligence & future warfare: implications for international security. *Defense& Security Analysis*, *35*(2), 147-169.

Khanzode, K. C. A., &Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Lee, L. W., Dabirian, A., McCarthy, I. P., &Kietzmann, J. (2020). Making sense of text: artificial intelligence-enabled content analysis. *European Journal of Marketing*

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

McCarthy, J. (2007). What is artificial intelligence?

Mohammad, S. M. (2020). Artificial Intelligence in Information Technology. *Available at SSRN 3625444*.

Murali¹, N., &Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Murali¹, N., &Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Osoba, O. A., &Welser IV, W. (2017). *An intelligence in our image: The risks of bias and errors in artificial intelligence*. Rand Corporation.

Spiro, R. J., Bruce, B. C., & Brewer, W. F. (Eds.). (2017). *Theoretical issues in reading comprehension: Perspectives from cognitive psychology, linguistics, artificial intelligence and education* (Vol. 11). Routledge.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Teng, X. (2019, April). Discussion about artificial intelligence's advantages and disadvantages compete with natural intelligence. In *Journal of Physics: Conference Series* (Vol. 1187, No. 3, p. 032083). IOP Publishing.

Wagner, J. B. (2019). Artificial intelligence in medical imaging. *Radiologic technology*, *90*(5), 489-501.

Woolf, B. (1991). *AI in Education*.University of Massachusetts at Amherst, Department of Computer and Information Science.

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. *Materials Horizons*, *2*(2), 140-156.

ARTIFICIAL INTELLIGENCE: A THROUGH DISSECTION

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What is Artificial Intelligence?

[1] Artificial intelligence is the process and mechanism of making intellectually comparable machines, especially smart computer programs. It is comparable to the utilization of computer to understand human intelligence but does not use any naturally observable methods.

[2] Artificial intelligence is also the study of how machines work like human beings using mental capabilities by using computer programmed models. The word 'artificial' means synthetic or manufactured or made by humans and the word 'intelligence' means the capability to use one's head. The occurrence of the word intelligence however in this case makes it seem like as if the AI is a technique to for generating lots of clever thoughts but in reality the aim of artificial intelligence is to generate the mental capabilities of the general average human being.The term AI arose because of the belief that machines would one day be able to think and act like human beings especially in their decision making capabilities.

History of AI

[3] The commencement of artificial intelligence was because of philosophy, fiction and imagination. Early advancements in electronics, engineering and fields have affected AI.Some early achievements include work in solving problem questions, work in learning, representing knowledge, interference in addition to programs which are used to display translation, associative memory, theorem proving, language understanding and lastly knowledge based systems.[4]Artificial intelligence was assumed to have originated in 1956 in partial due to the famous Dartmouth college conference that had taken place in that year but in reality the beginning of AI was in the previous year(1955) when the first AI system(Logic Theorist) was designed by Allen Newell, Herbert A.Simon and implemented by Clifford Shaw at Carnegie Mellon University. The system had nearly solved and proved up to 40 theorems right.

[5] AI has also been based upon on possibilities, fiction and fantasies. From robots and artificially beings such golems in mythology, Frankenstein, mechanical animals and dolls were all inspiration for the development of AI and its advances. It was only in this century that the AI community has been able to conduct experiments and build experimental machines that test theories and hypotheses about these AI machines based on these fantasies.

Growth of AI

[6] Artificial intelligence is one of the main drivers of the industrial era and a key factor in the integration of upcoming technologies such as graphic processing unit, I.o.t, cloud computing and more.[7] The most asked questions nowadays to experts are about the growth of artificial intelligence in the next decade and the specific applications of AI in the future. Others questions asked include: "How will human-technology co-evolution be around the year 2040?" Well experts expect the rate of change to between incremental to extremely impactful and also expect AI efficiency in the workplace to be increased. AI is also expected to be incorporated into more human endeavors.Many are expecting AI driven systems to further improve the dimensions of their work, home and daily lives over the next decade.

[8] Also AI opportunities will be targeted at innovative, human inclusive approaches and further integration of AI based robotic technology to various industries and companies the world. AI is also expected to revolutionize the way new companies arise and compete in the coming decades.

AI in Healthcare Appliances

[9] The healthcare environment is realizing the value of AI powered equipment for the next upcoming younger generation. There is a lot of belief that AI can bring advances to any already existing processes in the healthcare sector. In addition to this the utilization of AI has proven to be more cost effective and is one the driving factors for its implementation.

[10] Before AI systems can be used in the healthcare sector, they have to be "trained" through data clinical data including screening, diagnosis, treatment assignment and more, so that similarity and associations between subjects and possible outcomes. These data exist in the form of demographics, notes and electronic readings from medical instruments, physical examinations, images and clinical laboratories.

[11] Medical applications of AI include: Diagnosis Aid:AI has proved to be way more effective at diagnosing compared to even the most experienced human doctors in some studies for example in identifying diseases like skin cancer. This is because doctors depend on their sensory organs, lab data and symptoms given by the patient.AI systems however just input of all these data variables into a model and use this to diagnosethe patient.

Health Monitoring: Patients no longer have to be in the vicinity of a hospital and instead can use wearable technologies using AI like fitness gadgets for tasks like monitoring their health.

AI in Manufacturing and Production

[12] Smart production systems need unique solutions to increase the maintenance and quality while manufacturing as well as reducing costs and this is where AI driven technologies are utilized. These technologies include: IOT, AR, cloud computing, embedded systems and more which are ready to produce new industrial products.

[13] The application of AI in intelligent manufacturing is evaluated on 3 main aspects: application technology, industry and practical application effect. In application technology, capacity of the infrastructure, single applications, synergy applications, and business development are taken into account. The industry evaluation is highly dependent on how well the manufactured product performs. Finally for the application effect its evaluation focuses mainly on how to increase product efficiency and economic and social benefits.

[14] How Can AI Be Applied in Manufacturing?

Many manufacturing applications are well suited to these advantages of AI. For example:

- Quality inspection: In the restricted area of a manufacturing plant, and AI can be used to carry out multiple inspection tasks quicker, more precisely, and efficiently than a human ever could.
- Optimizing supply chains: AI can be used to access specific and precise data.
- AI can maintain way more equipment than a human at the same time
- AI does not need to be watched by a human and can work by itself.
- AI can be used security and Software

AI in Security and Surveillance

[15] There are a broad variety of uses of AI in security; these areas include cyber security, Information security, economic and financial tools of statecraft defense,intelligence, homeland security, diplomacy and development. [16] There are multiple areas of use of AI in cybercrime including: intrusion detection and prevention, "Denial of Service(DoS) detection, computer worm detection, spam detection, zombie detection, malware classification and forensic investigations". AI techniques such as Heuristics, Data Mining, Neural Networks, and AISs, have also been applied to new-generation anti-virus technology ICT also plays a vital role in policy design, decision, implementation, and ultimate productive services. The primary task of this is to explore the role of artificial intelligence (AI), machine learning (ML), and deep reinforcement learning (DRL) in the evolution of AI in aspects such as security

AI in Education

[17] The utilization of Artificial intelligence in the field of education has been undergoing research for decades. This field researches learning wherever it happens form traditional classrooms to workplaces to improve formal education and lifelong learning. It combines AI along with learning sciences (anthropology, education, psychology, neuroscience, linguistics and also sociology) to upgrade the adaptive learning environments amongst other features to make the education field more personalized, relative, flexible, interactive and extremely effective. The scientific goal of AI is to make a digital model which is precise and uses explicit forms of educational, psychological and social knowledge which are often left implicit. In simple terms AI is used to open the 'Black Box of Learning' which essentially gives the learners a deeper more fine grained understanding of learning of a concept actually works.

[18] AI can now be used in many other fields due to the rise in the multimedia and information technologies as well as the internet for example teaching. Radical changes have now been made to the traditional teaching process which has enabled multiple schools to recognize e-learning as having high prospects to change people in terms of education, skills and performance-wise which has created more opportunities. for the upcoming generations and the learners of today.

[19] AI had always been considered as an advance in the education field and one of the popular forms of using AI in the education field from the past decades have been in the form of robots. Examples include 'Lego minds storm kits', Ozobots and Cubelets.

Advantages of AI

[20] Artificial intelligence is mainly used to solve problems with the objective of eliminating blindly worked areas which cannot be fixed by traditional time consuming methods.

[21] Some advantages of AI include permanency with which it operates, increased reliability in comparison to a human and cost-effectiveness.

[22] Another advantage is that the use of AI in addition to other technologies makes machines which makes choices and works in response to its programme only unlike a human who analyzes many factors both emotionally and practically.

[23] Other advantages of AI include:

- Finishes task faster than a human
- AI can easily finish stressful,difficult and complicated tasks unlike a human who is affected by a lot of factors.

- AI can multitask and various tasks can be carried out at the same time without any problem whatsoever.
- AI has a high success rate in comparison with the other methods available to the general public.
- There are very few errors and defects when using AI excepting the errors in programming of the artificial intelligence code.
- AI does not take too much space.
- AI has a small size

[24] Last but not least, the function of the AI is infinite.

Limitations of AI

[25]A major limitations of AI is that since it is essentially a 'black box of Learning' made from variables based on training data of scenarios, there may be issues for AI to act in different or unexpected scenarios.Another limitation is that AI are not guaranteed to reach the optimal solution for any problem and that It is often very hard to gain insight into the problem and the nature of the solution. A third limitation associated with the use of AI methods to solve a given problem stems from the fact that, for several AI methods, there is currently little guidance on how to decide upon the best values to use for a given method's tuning parameters.

AI also is only as good as the programming used to create it. A fourth limitation is that AI needs parameters and it may be difficult to determine the best parameters to receive optimum results for the required criteria.

[26] Artificial intelligence algorithms are also prone to being bias in data as they are made based on programs and the programs could be influenced by the programmer based on his environments.

[27] Another limitation is that at the moment AI has limited applications for example only I.T based applications such as data analysis, predictions etc.

It may not be easy to develop the machines because the equipment are expensive.

[28] Artificial Intelligence systems and equipment may be expensive.

People observing AI see them as very one-sided — capable of powerful processesbut totally incapable of acting emotionally or sentimentally.

[29] Since AI is essentially incapable of feeling it cannot respond to/act on unexpected situations [30] in-addition to that also requires a constant power supply to function at the present moment in time.

[31]More Disadvantages include:

- Creativity is solely dependent on the programmer
- AI lacks the humans finish/touch on it
- The increased use of AI means that the dependency on the technology is greater
- AI development can lead to an increased array of lost jobs and also increases the unemployment problem.
- AI embedded machines are only able to execute the tasks they are designed or programmed to do nothing new.
- AI embedded programs have a chance to crash and give irrelevant incorrect outputs which might be a serious setback depending on the circumstances or situation.

Conclusion

The use and growth of AI is at an all-time high and continues to grow day by day AI has unlimited potential and the potential to be the best assistant and a vital tool to humans in many aspects of daily life such as healthcare, manufacturing, development etc, but at the same time can also lead to their downfall as the use of AI can lead to losses of jobs for example. Also the realm of AI has not been explored fully and yet remains to be explored completely. The overuse of AI can prove to be catastrophic as it may make humans lazy and lead to loss of vital skills and so extreme precaution should to be taken while using AI.Despite having all the potential in the world AI has also proven to be dangerous because if fallen into the wrong hands can lead to potential disasters. AI also has varying disadvantages such as being dependent on the programmer which may make it less effective in the real world and also it relies on models therefore it can as ineffective as well.So in conclusion, AI should be used considerately and not overused as AI is like a wave it has its highs and lows therefore can be blessing or curse at times

References

Abduljabbar, R., Dia, H., Liyanage, S., & Bagloee, S. A. (2019). Applications of artificial intelligence in transport: An overview. Sustainability, 11(1), 189.

Alugubelli, R. (2016). Exploratory Study of Artificial Intelligence in Healthcare. International Journal of Innovations in Engineering Research and Technology, 3(1), 1-10.

Anderson, J., Rainie, L., & Luchsinger, A. (2018). Artificial intelligence and the future of humans. Pew Research Center, 10, 12.

Arkorful, V., & Abaidoo, N. (2015). The role of e-learning, advantages and disadvantages of its adoption in higher education. International Journal of Instructional Technology and Distance Learning, 12(1), 29-42.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. Aayushi International Interdisciplinary Research Journal, 227-230.

Bohr, A., & Memarzadeh, K. (2020). The rise of artificial intelligence in healthcare applications. In Artificial Intelligence in healthcare (pp. 25-60). Academic Press.

Brynjolfsson, E., & Mcafee, A. N. D. R. E. W. (2017). Artificial intelligence, for real. Harvard Business Review.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. Ai Magazine, 26(4), 53-53.

Charniak, E. (1985). Introduction to artificial intelligence. Pearson Education India

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Cioffi, R., Travaglioni, M., Piscitelli, G., Petrillo, A., & De Felice, F. (2020). Artificial intelligence and machine learning applications in smart production: Progress, trends, and directions. Sustainability, 12(2), 492.

Crandall, D. J. (2019). Artificial intelligence and manufacturing. Smart Factories: Issues of Information Governance, 10-16.

Dilek, S., Çakır, H., & Aydın, M. (2015). Applications of artificial intelligence techniques to combating cyber crimes: A review. arXiv preprint arXiv:1502.03552.

Flasiński, M. (2016). Introduction to artificial intelligence. Springer.

Haenlein, M., & Kaplan, A. (2019). A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. California management review, 61(4), 5-14.

Hashimoto, D. A., Witkowski, E., Gao, L., Meireles, O., & Rosman, G. (2020). Artificial intelligence in anesthesiology: current techniques, clinical applications, and limitations. Anesthesiology, 132(2), 379-394.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., & Scharre, P. (2018). Artificial intelligence and international security. Center for a New American Security..

Jiang, F., Jiang, Y., Zhi, H., Dong, Y., Li, H., Ma, S., ... & Wang, Y. (2017). Artificial intelligence in healthcare: past, present and future. Stroke and vascular neurology, 2(4).

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. International Journal of Library & Information Science (IJLIS), 9(1), 3.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. Frontiers of Information Technology & Electronic Engineering, 18(1), 86-96.

Lu, Y. (2019). Artificial intelligence: a survey on evolution, models, applications and future trends. Journal of Management Analytics, 6(1), 1-29.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education.

McCarthy, J. (2007). What is artificial intelligence?

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi.

Shabbir, J., & Anwer, T. (2018). Artificial intelligence and its role in near future. arXiv preprint arXiv:1804.01396.

Ullah, Z., Al-Turjman, F., Mostarda, L., & Gagliardi, R. (2020). Applications of artificial intelligence and machine learning in smart cities. Computer Communications, 154, 313-323.

Valencia, J. M., Moreno, J. J. H., & Sánchez, F. D. J. N. (2019, November). Artificial Intelligence as a Competitive Advantage in the Manufacturing Area. In International Congress of Telematics and Computing (pp. 171-180). Springer, Cham.

ARTFICIAL INTELLIGENCE-A BOON OR A CURSE?

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What is Artificial Intelligence

[1] The science and engineering of making intelligent machines, especially intelligent and innovative computer programs is artificial intelligence. [2] It is a field within computer science that is attempting to build enhanced and latest generation intelligence into the computer system, which does not need the aid of human beings or any other external agent to complete the given task.

History of AI

[3] In the history, the beginnings of artificial intelligence are traced back to philosophy, fiction, and imagination. Early inventions in electronics, engineering, and many other disciplines and many other new ideas have influenced artificial intelligence. Some early milestones include work in problems solving, knowledge representation, and inference as well as programs in language understanding, translations from one to other, theorem proving, associative memory, solving complex problems and knowledge-based systems. [4] Until the mid-1980s, researchers believed that an intelligent system capable of doing high-level reasoning and tasks was necessary for both perception and action. This traditional model in view lead to the creation of AI.

Growth of AI

[5] Artificial Intelligence is considered the fourth industrial revolution. Artificial Intelligence with the help of big data has transformed all the industries around the world. Artificial intelligence refers to the simulation of human intelligence and ideas into computational systems so that the systems think like intelligent beings and mimic the actions of intelligent entities. [6] Artificial intelligence as a factor of competitiveness growth is beginning to be widely used by leading companies today. The introduction of artificial intelligence into the national economy system is enormous and cannot be limited to individual companies. Introduction of artificial intelligence into the national economy system would build a model of extended reproduction, errorless system, without disturbances between different sectors of the economy. Thus, the necessity of artificial intelligence in various fields lead to the growth of AI.

AI in Healthcare Appliances

[7] AI a well-known field in computer science as enhanced the human life in many aspects. AI has recently overcome human performance in several domains and there is a great hope in healthcare too. AI may allow for better prevention, detection, diagnosis, and treatment of disease. Major diseases that use AI tool include cancer, neurology, cardiology and diabetes. [8] AI, by virtue of their wide applications in personal electronic devices and in monitoring health, pressure sensors are another way of usage of the advanced science and technology present in modern society. Flexible pressure sensors based on organic materials, which sense the pressure or bp of a human, have emerged highly due to the promising applications of artificial intelligence in systems or appliances, such as wearable health care devices -wristwatches, mobile bp monitors etc. [9] The applications of AI technology in medical also include assisting medical robots and devices. For example, telerobots

can facilitate the communication between patients with medical professionals; assistive walking devices can help with manoeuvring, walking, standing, or sitting; and animal-like robots can communicate with and entertain the patients. AI Robots can also be used in surgery as assistant surgeons. The AI robots can be of great use for surgeons and doctors during a typical operation, as minimal errors and mistakes are done by the robots. Artificial intelligence has reached new heights in clinical cancer research in recent years.AI is applied to help in cancer diagnosis and prognosis, given its accuracy level, which is even higher than that of general expert.AI applied in clinical cancer improved this area and contributed a lot to improve human health. AI technology can help improve cancer diagnosis and prognosis, and continue improving human health in the coming future too. Artificial intelligence(AI) and related technologies are increasingly predominant in business and society, and are beginning to be applied to healthcare. These technologies have the capacity to transform many aspects of patient care, as well as administrative processes within provider, payer and pharmaceutical organizations. There are a number of research studies suggesting that AI can perform as well as or better than humans at some key healthcare tasks, such as diagnosing a disease. Today, algorithms and programs are already outperforming radiologists at spotting malignant tumours, cancer and guiding researchers in how to construct associates for costly clinical trials. Surgical robots (equipped with AI) were initially approved in the USA in 2000, provide 'superpowers' to surgeons, doctors improving their ability to see, and diagnose, create precise and minimally invasive incisions, stitch wounds and so forth. Important decisions are still made by human surgeons. Common surgical procedures using robotic surgery include gynaecologic surgery, prostate surgery and head and neck surgery.

AI in Manufacturing and Production

[10] Over the past few decades, intelligentization, supported by artificial intelligence technologies, has become an important trend for industrial manufacturing that accelerated the development of smart manufacturing. In modern industries, standard AI has been supported with some more attributes such that yielding of products has become the technical core of smart manufacturing. With AI-powered machines manufacturing, remarkable improvements in many aspects of production from manufacturing processes to end product logistics has been possible. [11] AI, advanced computing and deep learning methods have begun to find applications in manufacturing systems for automatic visual inspections, fault detection, imperfect products and maintenance, the major problems in manufacturing have been overcome by AI. [12] In current scenario, Artificial Intelligence has great influence on production processes. Research on AI has seen wonderful growth in recent years. We find that organizational factors, such as digital skills, data, company size, R&D intensity, have the greatest impact on the adoption of AI in manufacturing and in production. Also, in order to gain new insights into the interplay of new technology adoption and global production strategies and ideas, AI is being utilized and adopted for maximum purposes. [13] Adopting AI in manufacturing and services operations will ensure accuracy and precision in the process and will avoid delays with faster change in operations when required and cause minimal errors. It will also predict risks and demands based on data available to ensure best production. The process of manufacturing can be made smarter, easier and environmentally sound, thus avoiding mishaps also making the task hassle free. The use of AI in the factories can increase productivity and produce good quality products, along with ensuring a good safety framework. AI is widespread across all the sectors of the manufacturing and production industry, there has been drastic transformation in some parts of the industry with companies growing, developing, adopting, and using AI technologies and

solutions into their processes and production - including electronics, heavy electricals, automobile and also in agriculture. The services sector has seen significant usage of AI specially the IT sector. At the same time there are number of 'sector neutral' companies that develop AI technologies that can be applied to manufacturing goods and services. Machines equipped with AI are now being used in production units in India that manufacture electronic goods, appliances, mobile phones etc. The use of intelligent systems such as AI is now helping the sector in avoiding the hectic process of manual testing with the help of IoT and detection mechanisms. AI is also integrated into final products as robotic appliances, machines, user interfaces, and virtual assistants. For example, ASIMoV's Robotics' manipulator is used for assembling and in delivery of products. Gridbots, a company has also developed robots such as the High-Performance SCARA Robot23, which can be utilized for activities that require high speed, accuracy and precision, which is especially needed in the manufacturing of electronics. Another interesting start upthose aids in the field of electronics is Helpforsure24, that uses an AI powered chatting bot that automatically solves electronics maintenance and repair issues. For an example, Panasonic, the Japanese manufacturing company, has opened a 'Technopark' in Jhajjar in the state of Haryana. It focuses on manufacturing air conditioners and washing machines whose production and testing process is automatically controlled by artificial intelligence bots. The AI technology is used in agriculture production also. The agricultural manufacturing industry in India is of two sectors. The heavy agricultural machinery sector primarily manufactures machines such as tractors and tractor driven equipment, while the light agricultural machinery sector is involved in manufacturing smaller tools like motorized tillers, pumps, and harvesters and other small tools. Initiatives equipped with AI technology are mainly focused on enabling data driven agriculture through technologies such as image recognition, drones, machine learning, sensors, driverless tractors, and chatbots - for monitoring, for detecting of abnormalities or defects, undertaking tasks like spraying pesticides at correct situation, and predicting and forecasting growth and price. There are many start-up companies using AI in agriculture sector by using AI driven analytics to improve crop production in agriculture. Even though the adoption of AI technology in agriculture can result in more efficient farming and greater yields, there are challenges that have been identified. One of the major challenges is to access robust data, this huge data cannot be accessed easily due to lack of power and connectivity in fields and technical capacity to deploy the technology in fields.

AI in Security and Surveillance

[14] AI is used in image processing to detect theft and motion of thieves in CCTV footage, without the use of real-time sensors. This system concentrates on object detection. The security personnel can be notified about the suspicious committing burglary using Real-time analysis of the movement of any human from CCTV footage and thus gives a chance to avert the same.[15] Artificial intelligence technology is rapidly multiplying around the world. Amazing developments keep emerging from the onset of deepfake videos that blur the line between truth and falsehood, to advanced algorithms that can beat the best players in the world in multiplayer poker. Many businesses harness AI capabilities to improve analytic processing, city officials use AI to monitor traffic congestion and oversee smart energy metering. [16] With the advancement of science and technology, AI, the combination of the unmanned aerial vehicle (UAV) and camera surveillance systems (CSS) is currently a hopeful solution for practical applications related to security and surveillance operations. Security cameras(cctv) and video surveillance systems have become very important security systems for ensuring safety and security of the general public. The detection of high-risk situations through these systems are still performed manually by humans in many cities.

The lack of manpower in the security sector and a limited performance of human may result in delay in detecting dangers, threats, risks for the public. In response, various start-ups have developed real-time and automatic solutions for identifying risks based on surveillance videos. The main aim of this work is to develop a minimal cost, efficient, and artificial intelligence-based solution for the live detection and recognition of weapons in surveillance videos under different situations. This system was developed based on TensorFlow and was initially tested with a 294-seconds video which showed weapons within 5 categories, handgun, shotgun, automatic rifle, rifle, and submachine gun. As per the established standard values of 0.50 and 0.75, the system achieved a precision of 0.8524 and 0.7006, respectively.

AI in Education

[17] Artificial Intelligence is a booming technological domain that is capable of changing every aspect of our social interactions and activities. In education, AI has begun producing new teaching and learning methods that are now undergoing testing in different contexts. AI technology can help education systems by using data to improve educational equality and quality in the developing world. The future of higher education is intrinsically linked with developments of new innovative technologies and computing capabilities of the new intelligent machines. In this field, advances and improvements in artificial intelligence open new possibilities and challenges for teaching and learning in higher education, with the capacity to fundamentally change governance and the internal systems of institutions of higher education. AI favours collaborative environments and intelligent tutoring systems to support teachers and improve education systems. [18] AI has been extensively adopted and used in education, particularly by educational institutions, in diverse forms. Using artificial intelligence, instructors are able to perform different administrative functions, such as reviewing and grading student's assignments more effectively and efficiently, and achieve higher quality in their teaching activities, improving the present education scenario. Artificial intelligence is currently progressing at a rapid pace, and this already impacts on the nature of services within higher education. For example, universities already use an initial form of artificial intelligence technology, IBM's supercomputer Watson. This provides student advice for Deakin University in Australia at any time of day throughout 365 days of the year. Even though it is based on algorithms that are suitable to fulfil repetitive and relatively predictable tasks, Watson's use is an example of the future impact of AI on higher education. This is changing the structure and quality of services and the structure of its workforce. A supercomputer that is able to provide feedback at any hour is reducing the need to employ the same number of staff previously required for the same function. [19] Human learning is promoted by applying artificial intelligence to education. Information technology including artificial intelligence contributed a lot to education. Various technologies have been invented and developed to make it easier for students to learn and create an environment where teachers can more easily teach. An application of AI, a technology called learning analytics was developed.

This is a technology used for statistically analysing student's historical data obtained by digital learning, etc. and discovering the characteristics of the student.

Advantages of AI

[20] The major advantages of artificial intelligence are that its decisions are based on facts rather than emotions. Even after our extreme efforts, it is a known fact that human decisions are always affected negatively by our emotions. Another advantage is easier spreading of knowledge. Once an artificial mind is trained for something, it can be easily copied and transferred to others reducing the

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time wasted in otherwise passing on knowledge to other humans through training. [21]AI also offers to achieve accuracy with a higher precision and this consequently disables the human errors. Indeed, the AI technology error is very rare compared to human errors. Also, unlike human, AI are programmed to run for long hours. AI could bring changes to the fast-food industry. AI will soon start to affect every dining experience including preparing the meal, taking orders and delivery. The innovation in digital technology enables the customer to experience a non-stop service from the fast-food industry. [22] Artificial intelligence (AI) has reached new heights in clinical cancer research in recent years.AI is applied to help in cancer diagnosis and prognosis, given its accuracy level, which is even higher than that of general expert.AI applied in clinical cancer improved this area and contributed a lot to improve human health. AI technology can help improve cancer diagnosis and prognosis, and continue improving human health in the coming future too. [23] Robots will be the brains of the coming future education process. Various reports and surveys aim to clarify the current development trend of the application of artificial intelligence in modern education system by analysing the innovation progress of the combination of artificial intelligence technology and contemporary education. This is of great significance for better use of artificial intelligence to build a future oriented high technology education system. [24] Artificial intelligence (AI) technology can adapt to rapidly changing dynamic environments and provide multiple task requirements for resource allocation, computational task scheduling. AI technology, computing and storage resources are placed on the network to provide real-time data processing and also provides more efficient and intelligent services.

Challenges or Dis-advantages of AI

[25] Some of the major disadvantages of Artificial Intelligence (AI) technology in our daily lives are as follows.

- Sometimes AI technology can be misused leading to mass scale destruction.
- Program mismatch sometimes done opposite to the given command.
- Human jobs are affected.
- Unemployment problem increased furthermore.
- Creativity is solely depended upon programmer.
- AI technology lacks the human touch.
- Younger generation becomes lazy and depend upon machines for even small task.

[26] It's not easy to develop machines as the equipment is too expensive. Can cost tons of cash and time to create, build, and repair. Robotic repair can occur to scale back time and humans wanting to fix it, but that'll cost extra money and resources. [27] AI technology is unable to explain the logic and reasoning behind a certain decision. Lack of creativity in responses. AI cannot know when there is no solution to a particular problem. Any malfunction while running can lead to the AI producing wrong solutions and since it cannot explain the logical reasoning behind its answer, blind reliance on AI can lead to big problems. [28] The great minus is bugs and small errors which cost a lot further. When you assign complex tasks to artificial intelligence, do not forget that any machine or technology can fail. A small error in the calculations or tasks can become a root cause for a huge number of consecutive problems. This can also lead to loss of important data, which is available to machine. In addition to all these disadvantages, there is a fear that robots will replace people in coming future. Artificial intelligence technology can enslave us and begin to rule the world. [29] Advances in the field of artificial intelligence (AI) in recent years have led to more exciting capabilities, but also raised concerns about dangers. A major concern is about super-intelligent AI agents with the initiative and motivation to attack humans. Existing AI tools are

already being used extensively by cybercriminals to enhance the efficiency of their attacks. AI is also used against other AI systems, in stealing confidential data or in corrupting the operation of AI algorithms or in hacking the user's system to achieve the goals of the attacker.

Conclusion

In the last few years AI has significantly developed and is utilized in every aspect of our life. It has drastically improved in last decade and is being utilized in every sector. AI has been used in various sectors and it proved to be a good aid. The AI technology is used in manufacturing and production processes, in health care, in agriculture and in various fields. AI technology is also of great use in education, in collecting data, processing and verifying. There are many advantages and uses of AI tech, it plays an important role in our lives too, it is used in surveillance systems, managing our work, in mobile phones, in wearable tech as watches. AI technology is also used in health care, it is used in diagnosing, predicting diseases, also used in surgeries as robots. AI has many advantages and uses, given its uses there as many disadvantages of AI too. AI being a powerful weapon, when used for personal agenda can lead to mass destruction. When this AI tech falls into wrong hands it can lead to large scale destruction and can be so dangerous as a nuclear weapon. There are many other disadvantages of AI, as AI tech is penetrating into every sector of life it leads to unemployment too, also being an artificial mind, errors and mistakes are bound to happen which cost a lost further. Blind reliance on AI can get us into trouble. There are as many advantages and disadvantages of AI, but what makes use of it depends upon the user. AI has the potential of aiding in small task of our daily life to large scale destruction when fallen into wrong hands, it solely depends upon the user. AI can be simultaneously be a boon or curse, it depends on what one makes use of it. In the near future there is a lot of scope for AI. This high-tech AI can be of great use if one decides to use it properly and efficiently.

References

Abdulov, R. (2020). Artificial intelligence as an important factor of sustainable and crisis-free growth. Procedia Computer Science, 169, 468-472.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages of Artificial Intelligence. Aayushi International Interdisciplinary Research Journal, 227-230.

Brooks, R. A. (1999). Cambrian intelligence: The early history of the new AI. MIT press.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. Ai Magazine, 26(4), 53-53.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. Ieee Access, 8, 75264-75278.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Ding, H., Gao, R. X., Isaksson, A. J., Landers, R. G., Parisini, T., & Yuan, Y. (2020). State of AI-based monitoring in smart manufacturing and introduction to focused section. IEEE/ASME Transactions on Mechatronics, 25(5), 2143-2154.

Feldstein, S. (2019). The global expansion of AI surveillance (Vol. 17). Washington, DC: Carnegie Endowment for International Peace.

Ghimire, A., Thapa, S., Jha, A. K., Adhikari, S., & Kumar, A. (2020, October). Accelerating business growth with big data and artificial intelligence. In 2020 Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC) (pp. 441-448). IEEE. [6]Economic

Guo, J., & Li, B. (2018). The application of medical artificial intelligence technology in rural areas of developing countries. Health equity, 2(1), 174-181.

Han, L. (2018). Analysis of new advances in the application of artificial intelligence to education. Advances in Social Science, Education and Humanities Research, (220), 608-611.

Hoanca, B., & Mock, K. J. (2020). Artificial intelligence-based cybercrime. In Encyclopedia of criminal activities and the deep web (pp. 36-51). IGI Global.

Huang, S., Yang, J., Fong, S., & Zhao, Q. (2020). Artificial intelligence in cancer diagnosis and prognosis: Opportunities and challenges. Cancer letters, 471, 61-71.

Ji, H., Alfarraj, O., &Tolba, A. (2020). Artificial intelligence-empowered edge of vehicles: architecture, enabling technologies, and applications. IEEE Access, 8, 61020-61034.

Jujjavarapu, G., Hickok, E., Sinha, A., Mohandas, S., Ray, S., Bidare, P. M., & Jain, M. (2018). AI and the Manufacturing and Services Industry in India. *The center for Internet and Society, India. URL: https://cisindia.org/internetgovernance/files/AIManufacturingand Services_ Report_02. pdf.(06/01/2019).*

Kakadiya, R., Lemos, R., Mangalan, S., Pillai, M., &Nikam, S. (2019, June). Ai based automatic robbery/theft detection using smart surveillance in banks. In 2019 3rd International conference on Electronics, Communication and Aerospace Technology (ICECA) (pp. 201- 204). IEEE.

Khanzode, K. C. A., &Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. International Journal of Library & Information Science (IJLIS), 9(1), 3.

Kinkel, S., Baumgartner, M., & Cherubini, E. (2021). Prerequisites for the adoption of AI technologies in manufacturing–Evidence from a worldwide sample of manufacturing companies. Technovation, 102375.

McCarthy, J. (2007). What is artificial intelligence?.

Murali¹, N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Nagao, K. (2019). Artificial intelligence in education. In Artificial intelligence accelerates human learning (pp. 1-17). Springer, Singapore.

Nguyen, M. T., Truong, L. H., & Le, T. T. (2021). Video surveillance processing algorithms utilizing artificial intelligent (AI) for unmanned autonomous vehicles (UAVs). MethodsX, 8, 101472.

Nilsson, N. J. (2009). The quest for artificial intelligence. Cambridge University Press.

Osipov, S. S., &Ulimova, N. V. (2013). ADVANTAGES AND DISADVANTAGES OF AI. SCIENCE AND WORLD, 77.

Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). Artificial intelligence in education: Challenges and opportunities for sustainable development.

Rahim, S. M., Mohamad, Z. Z., Bakar, J. A., Mohsin, F. H., & Isa, N. M. (2018). Artificial intelligence, smart contract and Islamic finance. Asian Social Science, 14(2), 145.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. Materials Horizons, 2(2), 140-156.

ARTIFICIAL INTELLIGENCE

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What is AI?

[1] Artificial Intelligence is the science and engineering of making intelligent machines and computer programs.AI is designing of making clever machines, particularly wise pc programs. It is used to understand human nature using computer knowledge.AI is mainly divided into five main areas:Search,Pattern-Recogition,Learning,Planning,andInduction.To manage some critical problems machines will constructs some modes of environment, using scheme of induction. Goal of AI is to produce intelligent human behaviour in machines automatically, in our own intelligence. AI researches are free to use the methods that they observe in people or that involve more computing than people can do.AI has tremendous implementations, one of the part is Robotics. There are many research done for artificial intelligence. One main thing is research done on medical diagnosis called cadeceus program. AI Constantly faced problems in how to make the program. The ultimate goal of AI is to create person or an humble animal.AI is successfully travelling in thier goals and also the researchers said that they will achieve it as soon as possible.

History of AI

[2] In beginning Artificial Intelligence are traced to fiction and imagination. During the inventions of electronics, engineering and many other have used AI. Earlier works it include in solving basics in learning, knowledge, and programs translation, theorm, associative memory, and knowledge based systems. It belongs in the history of Human Intelligence to complicate teleological accounts.AI naturally emerge from centuries to reduce human reasoning to logical formalism. History also say that AI produce intelligent behaviour in machines run parallel to make human behaviour.AI is mostly used in medical field. In endoscopy AI is used to detect and rectify benign and maligant GI lesions and assess maligant lesions depth of invasion. It is also used in capsule endoscopy and inflammatory bowel disease. Thereby it is mostly used by endoscopist. It also works on incorporating clinical practice such as work flow integration, data storage, and data privacy.

Growth of AI

[3] Artificial Intelligence is considered as fourth industrial revolution. With the help of big data AI transformed all industries in world to simulate human intelligence into computer intelligence. The systems which are progammes intelligence can solve real world problems accurately than the system that are hardcoded.AI plays a major role in business analytics problems, it is also used to solve business such as marketing ,credit card fraud determination. The growth of AI is divided into two groups.1.Task from labour is integrated in growth model, 2.The aggregate demand is introduced. With these features AI ca decrease the labour income .When the elasticity is high it reduce demand and slow productivity.

In a Study AI technology was used to develop individual tree based basal area(BA) and volume increment models.The models successfully account for effects of incident solar radiation, growing degree days and incides of soil water and nutrient availability on BA and volume increments of over 40 species at 5 year intervals.

AI in Healthcare Appliances

[4] Artificial intelligence is used in healthcare for data management. It is the first step in revolutionizing the healthcare systems. It is also used in Health project and medical statistics.AI is used in Orthographic Surgery is remarkably poor to date. It is very powerful tool and it is responsible for entire medical profession. It plays a major role in ICT and have huge contribution in growth of medical systems. The challenging role for AI in healthcare is for IOT researchers.AI is mainly used in hear aids, ultrasensitive e-skin, height and weight measurement, medical diagnosis, health monitoring.AI is used as key parameters in pressure sensors. Many transduction mechanisms, which include piezoresistivity etc., exist for converting tactile stimuli to electrical signals.AI is used as exporation of functional materials for flexible pressure sensors. It optimize concept and recent developments of sensing devices towards practical pressure sensors.AI also includes scheduling patients, billing ,optimizing staffing, creating protocols, assessing image quality, reducing radiation dose and image interpretation.

AI in Manufacturing and Production

[5] Artificial intelligence in manufacturing mainly include manufacturing oriented big data network interconnection technology and many network technology. Ai is also an intelligent guarantee technology of online remote support services. Nowadays AI is used in many of the industrial applications. In garment manufacturing it is divided into three categories, namely, production planning control, scheduling garment quality control and inspection and garment quality evaluation. The main problem in garment manufacturing is adoption of AI technologies to realise the internalisation of environmental cost AI was applied in the decision of tree algorithm. Osmotic manufacturing is using AI as main processor to concert macro to micro, these can be interpreted and formalized in AM-AI linking the following ideas, utilizing and combining the findings and knowledge of AM-AI. Idea is, that a flow field, of every production or manufacturing process with a graph. When using a graph theoretic network the information amount decreases, depending on degree of net, also the relevant information is pertained in net itself if choosen appropriately.

AI in Security and Surveillance

[6] AI in cyber security represents as a potential usage arena for main areas. It is mainly used to scan and patch vulnerabilities. Humans should have a great efficient to visual data to scan like AI in security.AI is mainly used to scan the human activities and patch the unusual activities. In International level AI is used for military power, politics more broadly. Moreover AI is commonly used in Military. Algorithm named improved soft computing has been created to optimize the area coverage percentage of MWSN (Mobile Enabled Sensor Network). In International Security AI is used as voice recognition algorithm, open source for machine learning and understanding data.AI combined with UAVs and ground robotics are protected in the International Borders. They prevent future terrorist attack, reduce nation's vulnerability, minimize the damages and recovery from attacks that occur. They also prevent in border and transportation security, both domestic and international counterterrorism is prevented by AI, defending against catastrophic terrorism, emergency preparedness and responses are quickly accessed. Many ISI attacks are provoked by AI. The US National science Foundation is keep on researching in AI for International Security. Moreover every nations are working on AI for the security in Border and Even inside the nation.

AI in Education

[7] Artificial Intelligence (AIED) has undergone many developments over last Twenty Five Years. There are three major developments: 1. Goals, 2. Practices, 3. Environment. AIED mainly focus on changes that affect it.AI include supercomputer to include computer systems for education process..It is used in making robots. It also checks the spelling, pronunciation for chlidren It helps in answering deep questions. In China AI education has become popular in both government and private school sector. The field of AIED contibutes in both derivative and innovative .Firstly it brings theories and methods from related fields such as AI, cognitive science and education. Secondly it generates its own large research issues. Rising papers introduced a paper named AI and Education from web science and google scholar since 2010.70% people are interested to study in AI. But AI should get advanced more in deep learning and data mining to deal with complex issues. During corona period every country used AI as main learning technology. Schools of every country used AI to Teach. Moreover it is very useful for students for learning.

Advantages of AI

[8] AI is used by both teachers and students. For students it is used to search deep questions and for teachers it is used in making classes, question papers.AI is used in E-learning, where students and teachers are feeling comfortable to use As AI is used in E-learning issues of time and place are solved ,where travelling is prohibited by both students and teachers. Some robots like Ozobet and cutlets help in training teachers and children It records all the data thought in it and displays when everyone need It improves the quality of education It also develops learning capability and pro long the life of application. Some robots like Ozobet and cutelets help in training teachers and children It records all the data thought in it and displays when everyone need It improves the quality of education. It also develops learning capability and pro long the life of application. The fine advantage of AI is it understands all the languages we speak.AI researches succeed in their natural language.AI is used in most libraries to assemble the books The function of AI can be Infinite, in less time. It is also used to discover unexplored things. It can take stressful job and complete that without any struggle that humans have. It gives less errors and defects.

Challenges or Dis-advantages of AI

[9] AI users undergo contemption as lack of interaction and relaxation With respect to clarification, explanation and interpretation it is less effective then of traditional way of learning Human jobs are affected and Unemployment problem as been increased Technological dependency has been increased Requires a lot of time, money and investment Critical thinking is not implemented as a normal way. Emotions are affected by AI teaching and learning. If AI is used in learning ,thinking capacitance goes down. It can run a program and even reverse it and run it. It can be misused leading to mass scale distraction. Moreover it may corrupt younger generation. Lack of human touch is huge challenge. It has ability to replace the human jobs. Younger generation become lazy because of technology, technology dependency increased, the creativity is depends upon programmer, program mismatch is done opposite to the command. AI is also used by terrorists and terrorist attack. Most of the terrorist attack is not based on AI but some attacks are done by using AI.

Conclusion

[10]In My Opinion AI assists in multiple processes including scheduling patients, billing, optimizing staffing, creating protocols, assessing image quality, reducing radiation dose and image

interpretation. It is not something to be feared, as it will not replace humans, rather it should be embraced for its ability to improve and prolong lives. In future AI will enable new capabilities to address library users information needs. It is necessary to understand the advantages and disadvantages of Artificial Intelligence and machine learning for better use. Library and Information centres will get benefits by the development of the efficient experts system for technical services as well as Information processing and management. From the above information we can see that Artificial Intelligent Technologies can provide more competitive advantage. At the end we have been during this research through the brief history and growth of Artificial Intelligence. There is no top of AI, there is more return from it ,who knows what the AI can do for us within the future, may be it will be a whole society of robots. The continuous development of AI in education brought convenience to business English teaching The complexity of natural language learning provides useful place for artificial intelligence, which can promote individual learning, provide dynamic learning feedback information and improve learning efficiency. Artificial Intelligence can promote the use of language learning. Using Artificial Intelligence it can invest more time in the teaching process and become more energetic. Make full use of Artificial Intelligence technology to strengthen the in-depth and effective development of students learning. Therefore, Artificial Intelligence will make the world more powerful and safe.

References

Arkorful, Valentina, and Nelly Abaidoo. "The role of e-learning, advantages and disadvantages of its adoption in higher education." International Journal of Instructional Technology and Distance Learning 12.1 (2015):

Arkorful, Valentina, and Nelly Abaidoo. "The role of e-learning, advantages and disadvantages of its adoption in higher education." International Journal of Instructional Technology and Distance Learning 12.1 (2015)

Buchanan, Bruce G. "A (very) brief history of artificial intelligence." Ai Magazine 26.4 (2005): 53-53.[1]Dick, Stephanie. "Artificial intelligence." (2019).

Eldrandaly, Khalid A., Mohamed Abdel-Basset, and Laila Abdel-Fatah. "PTZ-surveillance coverage based on artificial intelligence for smart cities." International Journal of Information Management 49 (2019)

Ghimire, Awishkar, et al. "Accelerating business growth with big data and artificial intelligence." 2020 Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud)(I-SMAC). IEEE, 2020.[1]Babina, Tania, et al. "Artificial intelligence, firm growth, and industry concentration." Firm Growth, and Industry Concentration (November 22, 2020) (2020)

Li, Bo-hu, et al. "Applications of artificial intelligence in intelligent manufacturing: a review." Frontiers of Information Technology & Electronic Engineering 18.1 (2017): 86-96.[1]AbdJelil, Radhia. "Review of artificial intelligence applications in garment manufacturing." Artificial Intelligence for Fashion Industry in the Big Data Era. Springer, Singapore, 2018. 97-123.[2]Chen, Min, et al. "Environmental cost control system of manufacturing enterprises using artificial intelligence based on value chain of circular economy." Enterprise Information Systems (2020):

Malik, Garima, Devendra Kumar Tayal, and Sonakshi Vij. "An analysis of the role of artificial intelligence in education and teaching." Recent Findings in Intelligent Computing Techniques. Springer, Singapore, 2019.

McCarthy, John. "What is artificial intelligence?." (1998).[1] Minsky, Marvin. "Steps toward artificial intelligence." Proceedings of the IRE 49.1 (1961): 8-30

Murali[1], N., and N. Sivakumaran. "Artificial intelligence in healthcare–a review." (2018).[1]Bouletreau, P., et al. "Artificial intelligence: applications in orthognathic surgery." Journal of stomatology, oral and maxillofacial surgery 120.4 (2019): 347-354.[2]Talpur, Mir Sajjad Hussain. "The appliance pervasive of internet of things in healthcare systems." arXiv preprint arXiv:1306.3953 (2013).

ARTIFICIAL INTELLIGENCE

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What is Artificial Intelligence ?

[1] The term artificial intelligence refers to the fast computers we use, big and small machines which are used to imitate human intelligence to make our work easier and faster with much less labour work. It also involves softwares which gives us our desired results faster . [2] The intelligence or we can say problem solving capability shown by artificial things such as robot managers in hotels made by humans embedded with mechanisms which solve the problems according to situations can describe the very meaning of artificial intelligence.

History of Artificial Intelligence

[3] In history this vast growing sector was mainly based on fiction and imagination and this was not wrong to think that who would have thought that big computerised machines and more compatible robots will become part of modernisation. Earlier milestones in this field were theorem proving and helping in translation and providing associative memory. [4] In the 1940s when programmable digital computers were made it gave the idea to a handful of aspiring scientists to make an electronic brain based on the essence of mathematical reasoning. Some think that John Mccarthy coined this term for the first time but it was used way before which was shown in Vannevar Bush seminal work.

Growth of Artificial Intelligence

[5] Artificial intelligence is now used in many sectors. In medical, financial, educational, it has also contributed to the economy of nations and the production of big companies. [6] We can see that in healthcare AI has shown great productivity in research of medicines and surgeries including robotics. In management we can see robotic workers(as receptionists) also to keep big datas which are accessible easily and also help in matters of cyber securities . Examples of its growth can be seen that now we are able to minimize traffic jams because of sensors that sense road conditions. Now we can also make calls with the help of wristwatches and use them as mini phones.

Artificial Intelligence in Healthcare Appliances

[7] There are wide applications of AI in healthcare starting from organizing patient routes to providing better treatment tactics. In the case of AI they are not bothered by the number of patients and stretch work hours. For providing right diagnosis AI uses arithmetic algorithms along with using data science from the human body. By using AI for drug discovery this process which was expensive and tedious earlier has now become cheaper and quicker. [8] In healthcare appliances AI has played a significant role in the development of flexible pressure sensors. These sensors have advantageous properties with great flexibility and compatibility in large areas processing techniques. Pressure sensors have yet another wonderful application named mobile biomonitoring which can be used for medical diagnosis. [9] We would never have guessed that science would develop so much that we would be able to see robotic surgery as an achievement of AI in the healthcare field. This robotically assisted surgery was developed to improve the capacity of the surgeons performing open surgery. The surgeons use computer-controlled robotic arms for assistance and its end factors. The best benefit of using these computerized techniques is that the surgeons need not be available during the surgery rather they can be anywhere in the world.

Artificial Intelligence in Manufacturing and Production

[10] AI has been of great help in manufacturing systems which are automated visual inspections, maintenance and fault detection. People are making efforts to use this science in works like production scheduling and material handling. AI holds a good potential in manufacturing semiconductors. [11] The manufacturing industries are a strong pillar of a nation's economy and support many livelihoods. Deep fusion of information communication technology and product related expertise is enabling a game changing transformation in manufacturing approaches. Developed countries such as the US have drafted many policies for intelligent manufacturing. Such an example is "Industrial Internet" in 2012 to connect people , data , intelligent equipment to enable smart and fast decision making. [12] In case of India as it is an agrarian country most of its revenue comes from agriculture sector with the advancement of latest technologies and their usage will foster it's growth. With the help of AI and ML systems farmers can make packaged commodities and storage more effective, with lower wastage, and it can also provide intelligent data about the crops to facilitate smart inputs.

Artificial Intelligence in Security and Surveillance

[13] Now in this developing world there is also a growing need for advanced security systems. AI has proved its importance by providing various intelligent softwares and machines. Basic examples are CCTV cameras which are used for surveillance and also by using AI and Deep Neural Networks the VCA softwares are being trained to identify and distinguish between various objects.[14] In law enforcement the face recognition software is of great use to identify the criminals from their past records.This feature has made their work faster and they are able to collect such vast data with great ease. In this field machine learning techniques can be used for regeneration and to compare two video backgrounds and to help forensic teams for identifying vehicles. We can say that Artificial Intelligence is the coming evolution in video analytics.Video monitoring softwares which is growing with time also plays an important role in the military [15] To facilitate surveillance facilities AI helps in detecting if a person is entering a restricted area or if there are any unusual behaviors and it reports it. AI uses the surveillance data to ensure that the person has paid for the parkings. Countries like the US and China have developed millions of surveillance cameras and are leading in this field. China is supplying AI based technologies to at least 60 countries.

Artificial Intelligence in Education

[16] In education AI has provided benefits to both teachers and students. Now the student can learn from a teacher while they are in their homes and also in the cases when they are travelling via phones or laptops. There were times when students had to buy a decent bundle of books but now we can download study materials in our phones and laptops and can access them anytime , this has also been a good benefit for students. For any information they can access google or other platforms for solving doubts or to understand topics for free. [17] There are also paid platforms where we can prepare for different competitive exams and get guidance from teachers with good qualifications . Some of these platforms are unacademy , byjus, and vedantu. These types of platforms are of great benefit for students and for people with good qualifications who are looking to teach the students. [18] The areas in which AI has been applied in the education field are robotics video conferencing audiovisual files content development. Also in administrative tasks such as reviewing students' work, grading and providing feedback to the students.In this pandemic we have seen various

examples like zoom meeting and many more where educational institutions have taken online classes and these are good examples in which students are taught virtually and their study materials have been provided as soft copies like pdfs. In some countries people are also trying to use robots as teachers which is an ongoing project. It will take time but steps are taken to try to incorporate them in smart classes.

Advantages of Artificial Intelligence

[19] AI has provided benefits in a vast number of sectors such as healthcare, education, management, and security. In healthcare AI can help researchers to collect vast data from various resources. One example is that a medical research body like Childhood Cancer Data Lab is trying to develop useful software for medical practitioners. [20] In education students have experienced many benefits like they can study anywhere just they need their smartphones free or paid. They have the freedom to choose their favourite teacher so they can feel comfortable and have access to study materials whenever they want. This also helps teachers as it increases requirements for good teachers who can teach on such platforms in their homes and also with animations and different methods more creative interaction can be made between students and teachers. [21] As one's business grows they need better technology and systems for maintenance security and production for their buisnesses. AI integrated systems provide this better quality and this also results in reduction of human error for management. In the pharmaceutical sector they can use this technology for drug discovery data analysis and retailers can use this to strengthen their marketing methods. [22] Security is very important for anyone whether it can be physical or virtual(on digital media) whether it can be for a person or any organisation. With this we have heard the word CYBERSECURITY a lot of times. AI plays an important role to make it easier and the benefits it provides in cybersecurity are, to be able to maintain large amounts of data and to detect threats that are designed as routine activities for big or mid sized firms. One more good feature is that AI cybersecurity can learn over time. That means over time AI solutions learn about regular traffic and can spot deviations from the norm. [23] Artificial Intelligence can also be useful for law enforcement and crime solving. One of the basic examples is to store the details of criminals and their DNA in such an efficient system that can be used to match it in the future. AI systems can also help authorities to find if any goods are being illegally transported outside the country. Face detection softwares are also widely used in police work and are very useful for identifications. Surveying scenes of crime can be done using AI cameras.

Challenges of Artificial Intelligence

[24] As AI has provided us so many benefits we might not be able to look at the cons that also comes with AI. In the field regarding manufacturing and education where AI has provided such benefits it has also raised problems such as depletion of job requirements for people as these works are now done by machines and also these machines are not easy to build, they require equipment which are expensive and thus adds extra pressure on manufacturing costs. Now as students can get any answer they want just by searching they have become lazy and completely dependent on their devices like mobile phones. There are also many questions on the credibility of E-learning like it may negatively impact socialization skills for the students as these skills are important and also they fail in providing real life experience which is an important factor. [25] As AI has provided many benefits in healthcare there also are some limitations as even though it is used, human surveillance is

still required. As in surgeries robots perform logically but sometimes because of unusual problems it can endanger patients life. There can also be inaccuracies in medical diagnosis because of some portions of missing data, also it may result in job depletion. According to a World economic forum report AI will result in the displacement of 75 million jobs by 2022 which is a growing number and increasing problem. [26] In business also there are some limitations of AI as there is a shortage of skilled people with adequate training to effectively operate AI solutions. Another big reason is cost, as the latest smart technologies can be complex and it will add to the cost to operate them and their maintenance to be on par with the competition. There are also some measurements that are needed to be taken in businesses like customer privacy and technological complexity as these can be in constant danger if not provided with right security and maintenance. [27] In agriculture there are challenges faced by farmers using new AI technologies. Because of lack of experience on using such complex systems and there are high number of those who believe that these technologies are not for agriculture sector and many have no experience in operating simple technology also, therefore in developing countries it is important for the tech companies to provide training and information to these farmers to do business in agriculture sector. There are also security issues since there are no clear policies; these can lead to legal issues and cyber attacks. [28] As science and technology is progressing different nations are trying to incorporate use of AI in military training and warfare but there are some challenges in using these technologies like reduction of the strategic stability, AI also fails in doing multitask on battlefield or we can say that at present there is no technology that can identify enemies and at same time use favourable method according to the situation. One more big problem is that the AI systems are unable to explain why they made their decision because it is important to know as for legal and moral purposes and in the end they are also in danger because of poor data or small mistakes in security of such systems.

Conclusion

I think that many of us have been experiencing benefits of AI in our lives either by knowing it or not. Some examples are taking online classes, watching large scale production of various products by computed machines.

Introduction of AI has definitely no doubt helped us in many ways making our work easier, efficient. But the problem arises when it comes to the labour class or the people who cannot enjoy this luxury. They work in these industries but because of AI now if the people keep losing their jobs then this new world with science dreams is not giving benefits to all equally. Also to use AI in different sectors there is a need for people to be trained , so who is going to do that as in companies employees are expected to learn these machine learning and languages beforehand . It is predicted that in the coming years millions of people will lose jobs so introducing AI machines , robots can be efficient or money saving but it will harm working class people in many ways.

There are some challenges in using this on which people are working to incorporate more advanced technology which will come with time, maybe not today but researches are going on how to make it more safe and easy to work with. There is a need to solve the unemployment problem and training the people in the right way on how to use these AI system rest flaws can be taken care one by one as human science proceeds.

References

Abdulov, R. (2020). Artificial intelligence as an important factor of sustainable and crisis-free economic growth. *Procedia Computer Science*, *169*, 468-472.

Arkorful, V., & Abaidoo, N. (2015). The role of e-learning, advantages and disadvantages of its adoption in higher education. *International Journal of Instructional Technology and Distance Learning*, *12*(1), 29-42

Bouletreau, P., Makaremi, M., Ibrahim, B., Louvrier, A., & Sigaux, N. (2019). Artificial intelligence: applications in orthognathic surgery. *Journal of stomatology, oral and maxillofacial surgery*, *120*(4), 347-354.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53

Charles, J. (1998). AI and law enforcement. *IEEE Intelligent Systems and their Applications*, *13*(1), 77-80

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies

Dhanabalan, T., & Sathish, A. (2018). Transforming Indian industries through artificial intelligence and robotics in industry 4.0. *International Journal of Mechanical Engineering and Technology*, *9*(10), 835-845.

Dick, S. (2019). Artificial intelligence

Ding, J., & Lu, Y. (2019). Application of Artificial Intelligence In Health care: Advantages and Challenges.

Eli-Chukwu, N. C. (2019). Applications of artificial intelligence in agriculture: A review. *Engineering, Technology & Applied Science Research*, *9*(4), 4377-4383

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education. *Boston: Center for Curriculum Redesign*.

Ke, R., Zhuang, Y., Pu, Z., & Wang, Y. (2020). A smart, efficient, and reliable parking surveillance system with edge artificial intelligence on IoT devices. *IEEE Transactions on Intelligent Transportation Systems*.

Kesse, M. A. (2021). Artificial intelligence: a modern approach to increasing productivity and improving weld quality in TIG welding

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

McCarthy, J. (2007). What is artificial intelligence?.

Mosteanu, N. R. (2020). Artificial Intelligence And Cyber Security–Face To Face With Cyber Attack–A Maltese Case Of Risk Management Approach. *Ecoforum Journal*, *9*(2).

Mosteanu, N. R. (2020). Artificial Intelligence and Cyber Security–A Shield against Cyberattack as a Risk Business Management Tool–Case of European Countries. *Quality-Access to Success*, *21*(175)

Murali¹, N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Nithin, T. P., & Kaur, A. (2020). AI in Healthcare and Medicine. *Journal of Dental and Orofacial Research*, *16*(1), 26-31.

Raaijmakers, S. (2019). Artificial intelligence for law enforcement: challenges and opportunities. *IEEE Security & Privacy*, *17*(5), 74-77.

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education*, *26*(2), 582-599.

Ruiz-Real, J. L., Uribe-Toril, J., Torres, J. A., & De Pablo, J. (2021). Artificial intelligence in business and economics research: trends and future. *Journal of Business Economics and Management*, *22*(1), 98-117.

Russell, S., & Norvig, P. (2002). Artificial intelligence: a modern approach.

Schlögl, S., Postulka, C., Bernsteiner, R., & Ploder, C. (2019, July). Artificial intelligence tool penetration in business: Adoption, challenges and fears. In *International Conference on Knowledge Management in Organizations* (pp. 259-270). Springer, Cham.

unities for sustainable development Pedro, F., Subosa, M., Rivas, A., & Valverde, P. (2019). Artificial intelligence in education: Challenges and opport.

Wolfrum, R. (1984). The Problems of Limitation and Prohibition of Military Use of Outer Spau

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. *Materials Horizons*, *2*(2), 140-156.

ARTIFICIAL INTELLIGENCE

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What is Artificial Intelligence?

- Artificial intelligence is the study of using computers and machines to study human intellect. Artificial intelligence also includes engineering and sciences involved in making intelligent machines, or clever computers. However, AI doesn't have to pull itself back or to be limited to biologically observable ways.
- The goal of artificial intelligence in definite in understanding intelligence and building intelligent systems.
- It is a broad field of computer and sciences that focus on development of intelligent computers capable of doing tasks.
- It can also be defined as, capability of a machine to intimate human's behaviour.

What is History of Artificial Intelligence?

- The history of artificial intelligence is a story of fantasy, demonstrations and promises.
- Over the past half century, the AI community has succeeded in building experimental machines that test hypotheses about the mechanisms of intelligent thinking and behavior.
- Although reaching a fully developed Artificial Intelligence still remains in the future, we must keep the dialogue ongoing about the implications of completing the promise.
- Classical thinkers attempted to define human thinking as the mechanical language of symbols, laying the base for today's AI.
- The field of Artificial Intelligence research was founded at a workshop held on the campus of Dartmouth College. Those who attended would become the first AI researchers for decades.

Growth of Artificial Intelligence

- The desire of creating non-biological intellect has existed for centuries, even before AI was established.
- The role of AI powered technologies in next generation healthcare technology, manufacturing and production, security and surveillance and many more is being recognized by many sectors.
- AI is thought to have ability to enhance every phase of services and sectors, even these systems are expected to save a lot of capital in upcoming years.
- Artificial intelligence has the potential to boost the capacity of capital and labour to drive economic growth.
- Artificial Intelligence can turn today's fantastic movies into realistic scenarios, it may even possible in future for robots to do police tasks.
- Importance of AI for economic growth and societal development, authorities must not only avoid stifling AI innovation, but also actively assist its continued development and applications.

Artificial Intelligence in Healthcare Appliances

- Artificial intelligence is changing the landscape of healthcare and biomedical research.
- There are many ways and techniques in which AI is playing an important role in healthcare appliances:
  ARAVIND EYECARE SYSTEM IN INDIA (for diabetic patients)
  - Diabetic Retinopathy (DR)
  - Fundus Photography
- An AI system trained on thousands of images can identify referable DR with physician-level sensitivity and specificity, according to a group of researchers from Google Inc. and other institutions.
- This technology is now combing and upgrading thus AI technology in clinical practices in numerous Eye Hospitals in India.
- For detecting moderate-to-serve-DR a technology method was published by university of IOWA which was further approved by US Food and Drug Administration (FDA).
- AI has lately re-emerged into the scientific and public consciousness, as new advances and technologies are revealed by modern companies and scientists at dizzying pace.
- As a result, AI triumphs from the 1970s through the 1990s that were formerly lauded as medical breakthroughs, such as the automated interpretation of electrocardiograms (ECGs)11, are now seen as useful but not true AI.
- Unlike the earlier AI systems, which relied totally on limitations of medical knowledge by experts and on making of robust decision rules. Recent AI research has expanded machines and ways of learning which can account for complex interaction, to recognize pattern and loop from the data.
- In diagnosis stage, AI literature analysis has a vast proportion starting from diagnosing image, genetic testing to electrodiagnosis. For example, Jha and Topol urged radiologists to acquire AI technologies during analysing diagnosing images that accommodated a lot of data information.

Artificial Intelligence in Manufacturing and Production

- Artificial Intelligence have shown their aptitude in fields such as customized product manufacturing, customized product design, customer management, manufacturing management, manufacturing maintenance, logistics, after sales service and market analysis.
- Artificial Intelligence (AI) encompasses theories, technologies, methodologies and applications aimed at enhancing human intelligence.
- Manufacturing not only includes AI, but it also includes techniques such as perception, machine learning, deep learning, reinforcement learning, decision making. Apart from this, it uses AI-enables applications like computer vision, natural language processing, intelligent robots and system recommendations.
- Incorporation of AI and industrialization of IoT brings benefits to smart and easy manufacturing. AI-developed tools upgraded manufacturing efficiency.
- Although, AI systems have their own drawbacks. For example, high-performance computing servers equipped with high end GPUs are mostly required to fasten the training process of massive data, while existing manufacturing facilities aren't fulfilled to the stringent requirement on computing capability.

- Artificial intelligence (AI) is the riding pressure at the back of this transformation, and it's far vital that we put together for an AI-ruled future. Robots and synthetic intelligence (AI) could be appreciably extra disruptive than whatever we have got visible before. Intelligent augmentation could be the cornerstone of the simplest AI systems.

Artificial Intelligence in Security and Surveillance

- There is a slew of direct AI applications that are crucial to national security. Some major authorities have indicated that, in recent years the cyber domain represents a key potential use sector for AI.
- In October 2016, director Michael Rogers revealed that the agency sees AI as "FOUNDATIONAL TO THE FUTURE OF CYBERSECURITY"
- The influence of AI in the changing threat landscape has major consequences for information security, mirroring the broader impact of AI in the information age through bots and associated technologies.
- Progress in AI technology will have an impact on robotics and autonomous capabilities, which could have a significant impact on future conflict and the military security balance.
- AI is now in a position to ensure the monitoring of video-data flows and security-based systems and can warm up security services of suspicious and anonymous activity.
- Every work and task done on the internet leaves trade, experts can trace the e-footprints and algorithms in counter to catch the victim.
- The impact of AI on safety might be decided through the technique and the way it's far implemented. The real utility of the principle to real-global issues might be crucial. Increasing the talents and impact of clever structures and robots will boom the significance of innovative choices taken through executives withinside the zone approximately places and time of use
- AI can help agencies avoid cyber-crime that may cost them money and destroy their brand. It may be trained to recognize key phrases or topics linked with harmful content, so averting a cyber assault.
- The management of data volumes will be an essential task of future disease surveillance architectures. Many ability reassessments of fitness records contain vast volumes of data, and we wish to find emerging disease patterns in these datasets in real time.

Artificial Intelligence in Education

- Artificial intelligence plays an important role in education and it'd be too naive to think that there's no impact of it in education
- Artificial Intelligence in education includes everything from AI-Driven, step-by-step personalized instructional and dialogue systems, through AI-supported exploratory learning, the analysis of student writing, intelligent agents in game based environments and student-support chatbots to AI-facilitated tutor matching.
- Also, AIED(International Artificial Intelligence in education) can also put some shine on learning and educational practices.
- The field of AIED is derivative as well as innovative. On one hand, it brings and collects theories and methodologies from related fields such as AI, cognitive science and education. Whereas on other hand, it generates its own larges research issues.

- The primary themes in AI research are adaptive learning, personalization and learning styles, expert systems and intelligent tutoring systems, and AI as a future component of educational processes, according to a search of "AI and Education" linked terms.
- The use of AI in education has resulted in significant progress in theory and practice in the new millennium. There are various paths and scenarios for incorporating AI into educational processes, with online learning and distance education receiving significant attention.
- In education, artificial intelligence entails developing theories and models in relation to the production of artefacts in a given experimental sector.
- The use of computers to simulate parts of educational circumstances that itself entail the use of computers as educational artefacts, some of which may incorporate computational models, is an important part of artificial intelligence in education research.

Advantages of Artificial Intelligence

- Artificial Intelligence applications are utilized to simulate human intelligence for either solving a problem or making a decision. AI provide advantages of permanency, cost-effectiveness and reliability while also addressing uncertainty and speed in either solving a problem or reaching a decision.
- AI applications can give permanency in an organization when human intelligence is attached to a single person or a group of people, preventing information from being lost when the individual or group members leave or are no longer available to the business.
- Artificial intelligence's decisions are based on facts rather than emotions, which is one of its key advantages. Despite our best attempts, human decisions are always influenced by our emotions in a bad way.
- It is a one-time investment, low maintenance or labor cost and it can be deployed very easily.
- Giving it a proper model it can outcompetes natural intelligence. Also it finishes tasks faster than humans, it is less errors and more efficient.
- Artificial Intelligence applications can provide permanency that prevents the knowledge from being lost when the individual or the group members retire or are no longer available to the organization.
- The life of the knowledge encapsulated in an AI framework could be as long as the relevance of the problems and decision scenarios remain unchanged. AI also enables the development of a learning capability which can be utilized to further prolong the life and relevance of the application.
- Learning from real-world success and failure is an enabling feature of AI tools known as "reinforcement learning" and is advantageous in that it increases the reliability of the tools with their increased use in applications

Challenges or Dis-Advantages of Artificial Intelligence

- The difficulty with software development for AI deployment is that software development is sluggish and costly. There are a limited number of skilled programmers accessible to create artificial intelligence software.
- AI can be sometimes misused in leading to mass scale of destruction.
- Human's jobs are affected and so unemployment problem is increasing.

- Machines can easily lead to destruction if the implementation of machine put in the wrong hands the results are hazardous for human beings**.**
- Making humans lazy with its application automation bulk of work.
- Human interference is getting less as AI replaces the bulk of repetitive chores and other duties with robots, which may present a serious problem within the utilization requirements. Every company is aiming to replace the least skilled employees with AI robots that can perform similar tasks more efficiently.
- The cultivation and practice of artificial intelligence and thinking ability are inseparable.
- AIs aren't built to perform creative activities. As a result, it should be obvious that AIs lack creativity and originality. They will never be able to equal the human brain, even if they can assist you in designing and building something unique.
- The results of current artificial intelligence technologies remain limited to specific intellectual areas, such as image recognition, speech recognition, and dialogue response.

Conclusion

- Artificial Intelligence is a broad branch of computer science that is focused on a machine's capability to produce rational behavior from external inputs. The goal of AI is to create systems simple that can perform tasks that would otherwise require human intelligence.
- Although AI can be a threat, either now or in the future. It is clear that it has substantial and critical benefits for humans. Using the systems that mimic human is next borderline in solving problems.
- AI is the center of a new enterprise to build computational models of intelligence. The main motive is that intelligence can be represented in terms of structures and symbols which can be programmed in a computer system.
- The combination of AI and human intelligence is definitely going to lead the development of computational and cybersecurity innovations which is for sure going to be a great initiative towards digital nation.

References

Aghion, P., Jones, B. F., & Jones, C. I. (2019). 9. Artificial Intelligence and Economic Growth (pp. 237-290). University of Chicago Press.

Agrawal, A., McHale, J., & Oettl, A. (2019). 5. Finding Needles in Haystacks: Artificial Intelligence and Recombinant Growth (pp. 149-174). University of Chicago Press.

Atkinson, R. D. (2016). 'It's Going to Kill Us!'And Other Myths About the Future of Artificial Intelligence. Information Technology & Innovation Foundation.

Baker, M. J. (2000). The roles of models in Artificial Intelligence and Education research: a prospective view. Journal of Artificial Intelligence and Education, 11, 122-143.

Bhbosale, S., V. Pujari, and Z. Multani. "Advantages And Disadvantages Of Artificial Intelligence." Aayushi International Interdisciplinary Research Journal (2020): 227-230

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. Ai Magazine, 26(4), 53-53.

Buchmeister, B., Palcic, I., & Ojstersek, R. (2019). Artificial Intelligence in Manufacturing Companies and Broader: An Overview. DAAAM International Scientific Book.

Chen, H., & Wang, F. Y. (2005). Guest editors' introduction: Artificial intelligence for homeland security. IEEE intelligent systems, 20(5), 12-16.

Chin-Yee, Benjamin, and Ross Upshur. "Three problems with big data and artificial intelligence in medicine." Perspectives in biology and medicine 62.2 (2019): 237-256.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Crandall, D. J. (2019). Artificial intelligence and manufacturing. Smart Factories: Issues of Information Governance, 10-16.

Ertel, W. (2018). *Introduction to artificial intelligence*. Springer.

Goksel, N., & Bozkurt, A. (2019). Artificial intelligence in education: Current insights and future perspectives. In Handbook of Research on Learning in the Age of Transhumanism (pp. 224-236). IGI Global.

Guo, Meng. "Advantages And Disadvantages Of Artificial Intelligence In Business English Teaching

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education. Boston: Center for Curriculum Redesign.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., & Scharre, P. (2018). Artificial intelligence and international security. Center for a New American Security.

Jiang, F., Jiang, Y., Zhi, H., Dong, Y., Li, H., Ma, S., ... & Wang, Y. (2017). Artificial intelligence in healthcare: past, present and future. Stroke and vascular neurology, 2(4).

Khanzode, K.C.A. and Sarode, R.D., 2020. Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. International Journal of Library & Information Science (IJLIS), 9(1), p.3.

Lu, H., Li, Y., Chen, M., Kim, H., & Serikawa, S. (2018). Brain intelligence: go beyond artificial intelligence. Mobile Networks and Applications, 23(2), 368-375.

McCarthy, J. (2007). What is artificial intelligence?

Neill, D. B. (2012). New directions in artificial intelligence for public health surveillance. IEEE Intelligent Systems, 27(1), 56-59.

Nilsson, N. J. (2009). The quest for artificial intelligence. Cambridge University Press.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Teng, X., 2019, April. Discussion about artificial intelligence's advantages and disadvantages compete with natural intelligence. In Journal of Physics: Conference Series (Vol. 1187, No. 3, p. 032083). IOP Publishing

Yao, X., Zhou, J., Zhang, J., & Boër, C. R. (2017, September). From intelligent manufacturing to smart manufacturing for industry 4.0 driven by next generation artificial intelligence and further on. In 2017 5th international conference on enterprise systems (ES) (pp. 311-318). IEEE.

Yu, K. H., Beam, A. L., & Kohane, I. S. (2018). Artificial intelligence in healthcare. Nature biomedical engineering, 2(10), 719-731.

ARTIFICIAL INTELLIGENCE

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What is Artificial Intelligence?

It is the technology and engineering of creating clever machines, especially clever pc programs. It is associated with the same venture of the use of computer systems to apprehend human intelligence, however, AI does now no longer ought to confine itself to techniques that can be biologically observable.[1]

ARTIFICIAL intelligence (AI) is outlined as intelligence exhibited by a man-made entity to unravel complicated issues and such a system is usually assumed to be a laptop or machine. AI is an integration of computer science and physiology Intelligence in easy language is that the procedure is a part of the power to attain goals within the world. Intelligence is the ability to assume to imagine making memorizing and understanding, recognizing patterns, creating selections adapting to vary, and learning from experience. AI is involved with making computers behave like humans in a lot of human-like fashion and in a lot of less time than an individual takes. thus it's referred to as Artificial Intelligence.[2]

History of AI

Two of the participants, Herbert Simon and Allen Newell, proposed more specifically that human minds and modern digital computers are "like-kind", that is, systems for processing symbolic information; both take symbolic information as input, manipulate it according to a formal set of rules, and in doing so can solve problems, make judgments and make decisions (CrowtherHeyck, 2008; Heyck, 2005; Newell and Simon, 1972). workshop, it became the dominant approach, and as a result, artificial intelligence researchers decided to identify the formal processes that made up intelligent human behavior in medical diagnosis, chess, math, language processing, etc., in the hope of reproducing this behavior by automated means.[3]

- In finding out computer science, it's extraordinarily helpful to know the background of philosophy, linguistics, biology, and psychology.
- Philosophers, from Plato and Aristotle to Searle and Dennett, have asked queries and provided opinions regarding the character of intelligence and {also the} ability to outline it in an exceedingly means that might change North American country to program a pc with real intelligence.
- The Fifties were a time of nice optimism in Artificial Intelligence and also a time of great progress within the field.

Turing' check could be thanks to determining if a pc is really intelligent, by seeing if it might fool a person's in spoken language into thinking that it too was human. it's wide believed nowadays that notwithstanding a computer could pass the mathematician test, it might still not truly be conscious or intelligent within the means that humans are.

In 1956 the term computer science was coined by John McCarthy.

- Since the 1950s, the study of computer science has been seasoned with an excellent deal of realism. The progress in recent years has been phenomenal. [4]

AI is, therefore, a part of laptop science. Its history may be a comparatively short one - as an associate degree freelance field of study, it dates back to the mid-1950s. The AI approach contrasts with an older methodology of finding out cognition, that of experimental psychology. science has long had intelligence among its central concerns, intelligence not even as measured in IQ tests, however within the broader sense within which it's needed for thinking, reasoning, and learning, and in their conditions high-level sensory activity skills, the representation of data and also the ability to use language.[5]

AI in India

The government of the Republic of India is sharply attempting to extend human capital on a national scale, with selected stress on its younger population through the talent India initiative, whereas seeking to draw in international production to India via its create in India program. the opposite part of this modernizing triad is that the Digital India initiative: a determined push to expand digital access nationwide. AI can have a right away impact on every of those flagship initiatives of Prime Minister Narendra Modi within the immediate future, creating it all the additional imperative for policymakers in India to require seriously AI's potential for national ways and to get on the line in developing AI technology. For the Republic of India to maximally take pleasure in the AI revolution, it should adopt a deliberate policy to drive AI innovation, adaptation, and proliferation in sectors on the far side simply goods and knowledge technology (IT) services. AI's fast diffusion begets distinctive opportunities and challenges for India: establishing policies specifically designed for the short term and crafting the Modi policies to include and emphasize AI, in addition to for the medium and long terms, can enable India to understand the technology's full potential. whereas India has beyond question been a good person of AI's rapid ascent, AI has however to capture the imagination of the country's policymakers. In preceding the chance to inaugurate national ways regarding AI, the Republic of India runs the chance of falling behind the U. S. and China. AI technology has monumental potential to form India's economic and national security future; within the absence of a selected policy regime, however, India can notice it tough to understand the total power of AI whereas doubtless falling prey to the prejudicial effects of AI proliferation.[6]

The development, introduction, and promotion of AI are conspicuously high on the Indian government's list of priorities, an approach based on the premise that AI has the potential to make life easier and society more egalitarian. In 2018, it provided significant funding for research, education, and training in new technologies such as AI, a 100 percent increase over previous investments.

This prioritization of digital technology is not new. The Union Government's Digital India initiative aims to transform India into a "digitally empowered knowledge society and economy". Digital India plans to provide a digital infrastructure as a basic service for all citizens, to incorporate such digitization into governance, and ultimately to strengthen citizens. The Digital India program is increasing funding for research, education, and training in new technologies such as AI. The Government has also begun to work towards ensuring that AI technology is made in India, and made to work for India as well, fitting squarely within its Make In India program (http://www.makeinindia.com/about), a government initiative to promote India as a global manufacturing hub.

While AI has featured as an important consideration in digital technologies broadly, several initiatives focused solely on AI have also emerged. This section will offer an analysis of certain salient features of each initiative in the scope of this article and does not intend to be an exhaustive analysis of each.[7]

AI in Healthcare Appliances

Robotic surgery, pc-assisted surgery, and conjointly robotically-assisted surgery are terms for technological enhancements that utilize the robotic systems to help in surgical procedures[42]. Robotically-assisted surgery was created to overcome the constraints of preceding minimally-invasive surgical procedures and to enhance the capability of medicos activity open surgery [43]. within the case of robotically-assisted minimally-invasive surgery, rather than straight moving the instruments, the surgeon uses one in all 2 ways to manage the instruments; either an on-the-spot tele manipulator or through computer control [44]. A tele manipulator could be a remote controller that permits the surgeon to execute the normal activities connected with the surgery in the meanwhile the mechanistic arms complete those movements victimisation end-effectors and manipulators to try to to the $64000 surgery on the patient[45, 46]. In pc-controlled systems, the medico utilizes a computer to upset the robotic arms and its end-effectors, but these systems still utilize tele manipulators for his or her data [47]. One useful use of the computerised technique is that the surgeon doesn't ought to be out there throughout the surgery, however rather is any place within the world, high to the probability for remote surgery [48]. the foremost acquainted surgical robot is that the engineer Surgical System [49]. Recently, Google has reported that it commenced operating with the pharmaceutical large Johnson& Johnson is planning a replacement surgical mechanism system[50]. they're not the sole revivals, though. With their AXSIS robot, Cambridge advisers are after to overcome the constraints of the Vinci, it is of big size and incapability to figure with very careful and delicate tissues[51]. Their robot somewhat depends on versatile parts and small, worm-like arms. The computer programmer| engineer|applied scientist| technologist| computer user} contemplate it is applied later in ophthalmology, e.g. in cataract surgery .

Computer science is a growing science that has applications in varied fields further as a healthful services framework. Studies demonstrate that AI could be an essentially developing market within the field of health care. it's a wide range of applications during this field love knowledge management, drug discovery, diabetic management, digital consultation etcetera

There are some established proof that medical AI will play a vital role in serving the doctors and patients to deliver healthcare way more professionally in the twenty-first century.[8]

Artificial Intelligence (AI) can facilitate in business and science and progressively each facet of our society together with tending. AI was made-up by McCarthy in 1955 and is outlined by "the science and engineering of making intelligent machine".AI works with minimal human interventions. AI solutions that help front healthcare employees discover and monitor illness efficiency. In the Covid-19 pandemic, AI will do a wonderful job for us like Robots aren't suspected with the virus so as that they're being deployed to complete several tasks like cleaning, delivering food packets in suspected areas, drugs to reduce the human interventions. AI has been applied {to several|to several} areas like program translation systems and intelligent personal assistants. AI conjointly found many utilised within the medical field at the side of widespread use of electronic health records (EHRs) and fast development natural science together with neuroscience. AI can facilitate the discovery of the patterns, heartbeats, and it'll continually police investigation our blood heat, pulse.

Early detection of chronic illness using AI treatments offers higher improves the standard of designation and provides treatments on it. AI will improve the patient's quality of life, additional life living chances. it's important to the event of those ways that gives the accuracy within the analysis of chronic disease.AI has been recently promoted mutually of the leading options in healthcare.

With the assistance of AI, machines provide very correct results than humans. The results of comparatively easy tasks, similar to tumour detection, carcinoma detection is incredibly satisfactory, with United Self-Defense Force of Colombia around 0.9 whereas the additional result's difficult 2task like mutations transcription standing prediction are less satisfactory. AI can save abundant life, with the help of AI we will manufacture the drugs. AI may be an important issue in human life as a result of it'll accuracy in each part of life in medical, healthcare. In healthcare, AI can do a good job.[9]

The virtual branch includes science approaches from deep learning info management to manage of health management systems, as well as electronic health records, and active steering of physicians in their treatment decisions. The physical branch is best delineated by robots wont to assist the senior patient or the attending surgeon. additionally embodied during this branch are targeted nanorobots, a novel new drug delivery system. The social and moral complexities of those applications need additional reflection, proof of their medical utility, economic value, and development of knowledge base ways for his or her wider application.[10]

AI in Manufacturing and Production

Modern producing and supply systems are supported by progressively} omnipresent and powerful computing networks. inside these networks, oceans of information are ceaselessly being generated by sensors, machines, systems, good devices, and people. along with side rising process capabilities, this huge knowledge is being analysed faster, more broadly, and more deeply than ever before. These advances have redefined the worth of computing (AI) technologies and opened a replacement age referred to as business 4.0 or the good Factory.

Advanced psychological feature computing and deep learning ways have begun to search out the application in manufacturing systems for automatic visual inspections, fault detection, and maintenance. There are active efforts to use reinforcement learning ways to material handling systems and production schedules. Industries hoping to convert time knowledge into unjust choices look for opportunities to integrate AI methods with ancient Operational analysis approaches, the ideas and technologies of the net of Things (IoT), and cyber-physical systems.[11]

Technical means by which new information and communication technologies, intelligent science and technology, major manufacturing technologies (including design, production, management, testing, and integration), technology Engineering, and related product technology are integrated into the entire system and product development lifecycle. The manufacturing lifecycle then uses autonomous sensing, interconnection, collaboration, learning, analysis, cognition, decision-making, control, and execution of human, mechanical, material, and information. environment to enable the integration and optimization of various aspects of a business or manufacturing group, which includes three elements (people/organizations, operational management and equipment, and technology) and five flows (information flows, flow of logistics, flow of capital, knowledge, and flow of services). This facilitates production and provides high-efficiency, high-quality, convenient, and environmentally friendly service for our use, and thereby improves the market competitiveness of the company or manufacturing group.[12]

Additive manufacturing (AM) is increasingly used in manufacturing. Due to its rapid growth, the efficiency and robustness of AM-based product development processes should be improved. Artificial intelligence (AI) is a powerful tool that has surpassed humans in many complex tasks. Intelligent agents can reduce the manpower required to increase AM production and achieve greater

resource efficiency. This study offers an introduction to artificial intelligence techniques. Next, the current development of AI-enabled AM product development is investigated. Existing intelligent agents are used for product design, process design, and manufacturing step issues. Based on the review, current research gaps and future research directions are identified. more efficient and complete intelligent agents, an intelligent AM framework based on cloud edge computing is proposed. Global consideration can be achieved in the cloud environment and rapid response can be achieved at edge nodes.[13]

AI in Security and Surveillance

There are many direct AI applications relevant for national security purposes, both in the United States and elsewhere. Kevin Kelly notes that in the private sector, "The business plans for the next 10,000 startups are easily predictable - take X and add AI. "1 There is also a wide range of applications for artificial intelligence in national security. Here are some examples from cybersecurity, information security, cutting-edge financial and economic tools, defense, intelligence, national security, diplomacy, and development. It is meant to be a comprehensive list of all the possible uses of AI in these areas but is merely illustrative examples to help members of the Homeland Security community ponder some uses of this evolving technology. (The next section looks at how broader AI-driven economic and social change could impact international security.)[14]

Recent developments in artificial intelligence (AI) suggest that this emerging technology will have a deterministic and potentially transformative influence on military might, strategic competition, and global politics in general. After the initial wave of in-depth speculation in the AI literature, this article provides much-needed detail for the debate. He argues that left unchecked, the uncertainties and vulnerabilities created by the rapid proliferation and spread of AI could become a major potential source of instability and major strategic rivalry. The article identifies several innovations and technological developments related to AI that are likely to have real consequences for military applications from the point of view of the tactical battlefield at the strategic level.[15]

Recently, unmanned aerial vehicles (UAVs) are improving connectivity and accessibility for civil and military applications. A group of UAVs with cameras onboard usually monitor or collect information about designated areas. Drones can build a distributed network to share/exchange and process the collected data before sending it to a data processing center. Huge data transmission between them can cause latency and high-power consumption. This article uses artificial intelligence (AI) techniques to process the flow of video data between drones. Therefore, each deployed drone only needs to send certain requested information to itself. Each drone processes data using artificial intelligence and sends only the data that matters to others. Drones, formed as a connected network, communicate within a short communication range and share their data. The convolutional neural network (CNN) technique automatically extracts from images the characteristic that drones send only moving objects rather than entire images. This greatly reduces redundant information for each drone or the entire network and saves huge power consumption for the network.[16]

AI in Education

The field of AI in Education is bothered with the development of AI school for the study of human teaching and for the engineering of systems that facilitate human learning, the sphere addresses queries that are semipermanent in nature: however, will systems facilitate learning and change the

mensuration of learning progress (Lesgold, 1988). The term 'intelligent tutoring system' (ITS) is often used regarding the engineering aspect of the discipline. process ways are utilized in support of AI activities akin to planning, control, data illustration and acquisition, explanation, psychological feature modeling, and dialog management. process models are used to explore and assess various theories regarding learning. An analysis is actuated by the promise of building captive erful teaching systems with larger data a couple of domains, enlarged ability to form inferences about student behavior, and increased reasoning ability about topic choice and response generation. This entry reviews this state of the sphere and discusses the history of the field. It addresses basic approaches to putting together teaching systems, recent developments within the field, and open research issues.[17]

However, whereas Al may need the potential to support the action of the property Development Goals (SDGs) of the United Nations, the speedy technological developments inevitably bring multiple risks and challenges, that have to date outpaced policy debates and regulative frameworks. And, while the most worries would possibly involve AI overwhelming human agency, a lot of impending issues involve AI social and moral implications adore the misuse of private knowledge additionally the} risk that Al might truly exacerbate instead of cut back existing inequalities.

Nonetheless, Al has also entered the world of education. "Intelligent, 'adaptive' associate degreed 'personalized learning systems are progressively being developed by the personal sector for reading in colleges and universities around the planet, making a market expected to be price US$6 billion in 2024 (Bhutani and Wadhwani, 2018). Inescapably, the applying of Al in instructional contexts raises profound queries - to Illustrate concerning what ought to be schooled and how, the evolving role of teachers, and Al' social and moral implications. There are various challenges, as well as problems adore educational equity and access. there's also a rising accord that the terrible foundations of teaching and learning are also reshaped by the readying of Al in education.

All of those problems are more difficult by the large shift to online learning thanks to the COVID-19 faculty closures.

Accordingly, this UN agency steerage seeks to assist policy manufacturers in higher perceiving the probabilities and implications of Al for teaching and learning, so its application in instructional contexts genuinely helps succeed SDG 4: guarantee inclusive and equitable quality education and promote long learning opportunities for all.[18]

Advantages of Artificial Intelligence

In a corporation wherein human intelligence is tied to a specific individual or a collection of people, AI programs can offer permanency that forestalls the know-how from being misplaced while the man or woman or the institution participants retire or are not to be had to the corporation. The lifestyles of the know-how encapsulated in an AI framework can be so long as the relevance of the issues and choice situations continue to be unchanged. AI additionally allows the improvement of a mastering functionality which may be applied to in addition extend the lifestyles and relevance of the utility. Learning from real-international fulfillment and failure is an allowing function of AI equipment regarded as "reinforcement mastering" and is effective in that it will increase the reliability of the equipment with their accelerated use in programs (2). The extensive utility of any device best takes place while its reliability has been mounted, and AI has already demonstrated to be pretty dependable in lots of unique programs due to its capacity to simulate human intelligence in a reasoning process. Like many automation, AI helps fee minimization because it allows discounts at the want of employees' time. An organisation can lessen sizable workforce time via way of means of

adopting suitable AI programs withinside the choice-making process, therefore decreasing operational costs. As selections ought to regularly be made below apparent uncertainties (i.e., with incomplete and unsure know-how), AI techniques are appropriate while a right away mathematical dating can not be mounted among reason and impact. AI fashions seize the uncertainty among real-lifestyles reason and impact situations via way of means of incorporating to be had know-how with chances and chance inference computations (3). AI techniques also can manage each qualitative in addition to quantitative records, a function that maximum strictly analytical techniques lack. Depending upon the computational time in phrases of algorithmic complexity and processor capacity, AI equipment can facilitate quicker choice-making via way of means of automating the decision-making process. Through records collecting and screening, processing, and choice-making, AI can assist quicker answers to complicated issues. A Chowdhury and Sadek 7 In transportation, several studies and programs have confirmed some of the above benefits of AI in general, and sizable studies have supplied proof of the benefits of particular AI equipment. Some examples of AI generation presently in use encompass changing site visitors sensors into smart retailers that could mechanically hit upon and record site visitors' injuries or are expecting site visitors' conditions (4). More recently, researchers have located AI to be extra dependable in assessing and predicting site visitors conditions, primarily based totally on microscopic site visitor records accumulated from motors on their path, as expected withinside the car–infrastructure integration or the related car program, in comparison to many different current algorithms. Utilizing microscopic site visitors records, transportation protection is some other realm wherein AI may be of sizable use (5). Here, AI equipment may be implemented to the identity of protection breaches, and withinside the improvement and control of the computerized reaction and management plans. The famous benefits and efficacies of AI cause them to be especially beneficial withinside the improvement and control of transportation systems. Specifically, in smart transportation systems, real-time sensing, detection, reaction, and management are of paramount importance, and AI may be applied efficiently in all of those programs. Indeed, a disbursed site visitors sensor and manage community is possibly the destiny of real-time site visitors control and manage. Here, disbursed sensor networks, comprised of various degrees of smart sensor networks, mechanically hit upon and reply to incidents and manage roadway communities as needed. Such a smart sensor community made from AI equipment can assist the improvement of the following era site visitors control system. With the numerous benefits of AI equipment, we anticipate their wider adoption in unique regions of transportation.[19]

One of the main advantages of Artificial Intelligence is that its decisions are based on facts and not emotions. It is known that human decisions are always negatively influenced by our emotions, even with our best efforts Unlike humans, machines with Artificial Intelligence do not need to sleep and thus overcome the inherent disadvantage of fatigue in humans

Easier dissemination of knowledge Once an artificial mind has been trained for something, it can very easily be copied onto others, which reduces the time lost in imparting knowledge to other people through training. [20]

Challenges or Disadvantages of Artificial

The principle behind Weak AI is solely the very fact that machines may be created to act as if they're intelligent. Weak AI simply states that thinking like options can be simply added to a computer to form them more helpful tools and this has already begun to happen. For example, once a personality player plays chess against a computer, the human player could feel as if the pc is truly creating spectacular moves. however, the chess application isn't thinking and coming up with at all.

All the moves it makes are antecedently fed into the computer by a human which is however it's ensured that the computer code can build the proper moves at the right times. a lot of samples of Weak AI are witness skilled systems, drive-by wires cars, and speech recognisation systems computer science (abbreviated as AI) is that the capability of a tool to perform activities, which might otherwise solely be expected of the human brain. These activities embody the capability for data and {also the} ability to accumulate it. It also includes the power to judge, perceive relationships and last however not least turn out original thoughts.

Lack of creativeness in responses

Inability to clarify the logic and reasoning behind a precise call

Current development is at a stage wherever the AI cannot grasp once there's no answer to a particular downside

Any defective can cause the AI manufacturing wrong solutions and since it cannot explain the reasoning behind its answer, blind reliance on AI can lead to issues

Lack of wisdom in reasoning may cause major problems

It may be wont to cause mass-scale destruction if given within the wrong hands All this being said, one amongst of} the foremost regarding downside with the event of AI is that it'll shortly begin work humans in every field so inflicting a high rate of unemployment, which might cause depression, crime, and poverty. Also, some fields need the human bit and there's a growing sense of belief that machines will quite probably ne'er be able to replace humans. The caring behavior of nurses in hospitals is one example of employment that humans feel machines will never be ready to do justice to.[21]

Disadvantages

It is not easy to develop the machines because the hardware is also expensive. but it will cost additional money and resources.

Robots, which replace jobs, can cause severe unemployment unless humans can solve the unemployment problem with jobs AI cannot do or seriously turn government into communism.

Machines can easily destroy if placed in the wrong hands. That is a minimum of fear of various humans.

Artificial intelligence makes humans lazy with its applications that automate most of the work. Humans tend to get addicted to these inventions which can put a damper on future generations.

As artificial intelligence replaces most repetitive and other tasks with robots, human interference decreases, which can be a significant problem in usage standards. Every organization tries to swap low-skilled individuals for artificial intelligence robots capable of doing similar work with greater efficiency.

There is no doubt that machines are much better when they involve efficient work, but they cannot replace the human bond that creates the team.[22]

Disadvantages embody its "black box" nature, larger process burden, disposition to overfitting, and also the empirical nature of model development. a summary of the options of neural networks and logistics regression is presented, and the benefits and disadvantages of exploitation of this modeling technique are discussed.[23]

References
Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intelligence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Chen, H., & Wang, F. Y. (2005). Guest editors' introduction: Artificial intelligence for homeland security. *IEEE intelligent systems*, *20*(5), 12-16.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Coppin, B. (2004). *Artificial intelligence illuminated*. Jones & Bartlett Learning.

Dick, S. (2019). Artificial intelligence.

Do, H. T., Truong, L. H., Nguyen, M. T., Chien, C. F., Tran, H. T., Hua, H. T., ... & Nguyen, N. T. (2021). Energy-Efficient Unmanned Aerial Vehicle (UAV) Surveillance Utilizing Artificial Intelligence (AI). *Wireless Communications and Mobile Computing*, *2021*.

Garnham, A. (2017). *Artificial intelligence: An introduction*. Routledge.

Hamet, P., & Tremblay, J. (2017). Artificial intelligence in medicine. *Metabolism*, *69*, S36-S40.

Holmes, W., Hui, Z., Miao, F., &Ronghuai, H. (2021). *AI and education: A guidance for policymakers*. UNESCO Publishing.

Johnson, J. (2019). Artificial intelligence & future warfare: implications for international security. *Defense& Security Analysis*, *35*(2), 147-169.

Kinkel, S., Baumgartner, M., & Cherubini, E. (2021). Prerequisites for the adoption of AI technologies in manufacturing–Evidence from a worldwide sample of manufacturing companies. *Technovation*, 102375.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

Marda, V. (2018). Artificial intelligence policy in India: a framework for engaging the limits of data-driven decision-making. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, *376*(2133), 20180087.

McCarthy, J. (1998). What is artificial intelligence?

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Pawar, A., & Mary, S. (2020). Artificial Intelligence in Medicine and Healthcare.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Tu, J. V. (1996). Advantages and disadvantages of using artificial neural networks versus logistic regression for predicting medical outcomes. *Journal of clinical epidemiology*, *49*(11), 1225-1231.

Vempati, S. S. (2016). *India and the artificial intelligence revolution* (Vol. 1). Carnegie Endowment for International Peace.

Wang, Y., Zheng, P., Peng, T., Yang, H., & Zou, J. (2020). Smart additive manufacturing: current artificial intelligence-enabled methods and future perspectives. *Science China Technological Sciences*, *63*, 1600-1611.

Woolf, B. (1991). *AI in Education*. The University of Massachusetts at Amherst, Department of Computer and Information Science.

GLIMPSE ON ARTIFICIAL INTELLIGENCE

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What is Artificial Intelligence?

[1] It is an art of designing intelligent machines and computer programmes. Basically, it is relatable to recognize human intelligence but it doesn't limit the methods which are observed biologically. It can be also considered as a computer-based technology which is very efficiently programmed to do understand basic human activities and to help them.

[2] To make human life more fruitful, some computational methods are used to study human behaviour which is known as artificial intelligence. In other words, we can say that artificial intelligence is the new type of technology and computer-based programme which is evolved to reduce the time and work load of humans, with efficiently and effectively in a very small amount of time.

History of the Artificial Intelligence

[3] In earlier times the line of thinking towards artificial intelligence was only fiction and imagination, means people had no knowledge regarding artificial intelligence. At that time, to use this innovative and new kind of technology was not their cup of tea. But as the time flies, some fundamental as well as creative inventions in the field of engineering and electronic items lead to boost the artificial intelligence. For example, in earlier time, in mathematics, to solve the big sums, or three variable equations, people used to solve it through pen and paper. But as the time passed away, inventions such as calculators and scientific calculators resolve this problem, they helped to solve big or step-based problems in some seconds.

[4] In ancient times, people were not friendly with the good advantages of artificial intelligence. For example, 20 years ago, people didn't have android phones whereas today, most of the people have it and now, mobile phones have become a daily part of our life. Even that, now a days people loved, familiar as well as enjoyed this new type of evolution of technology and feel happy to use this in their daily lives also. As our country is developing country, the Artificial Intelligence helped humans a lot to become advanced, fast and modern.

Growth of Artificial Intelligence

[5] Nowadays, artificial intelligence is becoming more efficient in modern society. It has helped the many parts of the world through its creative and new innovations. In this modern world, artificial intelligence is familiar in many people. For example, we can also say that, in these days, where each and every person in this world is busy in their own work, one of the best inventions, through the technology of artificial intelligence that is smart phone, with the help of them, we can do video calls, we can be stay connected through our family members as well as our relatives even if we are living far away from them. Now, at this stage artificial intelligence has become a major source of connecting people from far away parts of this world. Specialists honestly considered that artificial intelligence is becoming self-dependent day by day.

[6] Artificial Intelligence has assists to read and learn many of the activities and projects regardless of any field. It has proved itself to be very beneficial either it is a field of business, science or government through its excellent discoveries.

Artificial Intelligence in Healthcare Appliances

[7] As the time passed away, artificial intelligence had a great impact in healthcare area. For complex characteristics of human skin, the artificial intelligence device like Tactile sensor-based e-skin are used. With the help of computer and program interactive robots are also preferred for pressure sensing.

[8] In these days, doctor doesn't require to remember each and everything as earlier they do. Due to artificial intelligence each and everything is now computerised, which leads to reduce the mental pressure of the doctor. In past few years, there is a positive growth seen in the field of healthcare by artificial intelligence.

[9] In this modern world of technology, mobile phones are also termed as mini hospital at the time of serious cases. There has also been development in manufacture of medicine and modern artificial intelligence has played a major role in it.

Artificial Intelligence in Manufacturing and Production

[10] Computer techniques and artificial intelligence has a useful impact in the area of manufacturing and production industry. A huge availability of sensors and smart devices is increasing in modern world has evolved. Artificial Intelligence helped people to examine the quality of product faster, more deeply as well as broadly. Artificial Intelligence helped to analyse the things in a very proper and systematic way.

[11] With the initiation of artificial intelligence, quality of product has been enlarged. It is also cost-effective and eco-friendly in some aspects, but in some ways, some of the inventions of artificial intelligence may harm the environment as well as it is also not cost-efficient. For example, the creation of self-driving cars. First of all, they are not much affordable by each and every common people, plus the batteries through which they are invented are not that much easy to recycle. Through safety purpose also, they are not that much better.

[12] Artificial Intelligence is also used in creating the environment cost control of manufacturing sector. Through the sources of internet, we can spread awareness about to save environment and all. The automatic robots and machines, we can do this efficiently and successfully.

Artificial Intelligence in Security and Surveillance

[13] Artificial intelligence played a very important role in security and surveillance. Information Technology has made it possible to identify any unusual activities. By the help of artificial intelligence, one can easily get alerts for any critical unusual activities. For example, advanced technology-based mobile phones with extra tight security are very protected. They cannot get easily hacked or something. Artificial Intelligence has proved itself very beneficial to identify unusual activities taking place against you anywhere.

[14] All the country's military forces started implementation of artificial intelligence. The biggest example is the invention of drones. Drones and advanced technology based hidden cameras (which are usually used for string operations) helps to keep an eye on the attack which is going to be done on our military forces through our rival. This also helps our military forces to previously be prepared for attack and take a fast action against it. So, this also helps our military forces to do adventurous and difficult task with zero risk.

[15] Artificial Intelligence have a great impact on military application for a tactical battlefield on a view of strategic level. Inventions of advanced feature as well as advance technology-based weapons helped a lot to the military forces.

Artificial Intelligence in Education

[16] From past 25 years, Artificial Intelligence had consequent change in the field of education. By introducing modern and new technologies, it reduces most of the pressure of human lives. Invention of devices such as laptops, computers, calculators, etc helps to solve step-based problems in mathematics and science which saves a lot of time.

[17] Nowadays, in the field of education, there is a vast use of artificial intelligence like standard use of computer-based programmes. It can be easily observed that the students of today's generation are very much interested in learning coding and making advanced as well as personalized learning apps and games. Also, the artificial intelligence and technology equipment results the implantation of robots which helps to enhance the elementary education of the students.

[18] Usually students were used to gain knowledge through books and theoretically, but as the Artificial Intelligence enhanced, now the students are able to recognise the things practically and experimentally as well. For example, we can say that, after the evolution of smart board and smart classes, students learnt very new kind of things much faster as compared to they learnt through books. So, up to many extents, Artificial intelligence technology has benefitted the education field a lot.

Advantages of Artificial Intelligence

[19] The fast as well as advance electrical sensing devices had helped to progress artificial intelligence in the field of healthcare. Inventions of pressure sensors helped humans a lot. By providing certain signals, it generates various pressure such as blood pressure which is a standard healthcare indicator.

[20] Artificial Intelligence had already proved itself to be very advantageous. Its ability to provoke human intelligence and its cost efficiency reduces the personal time of humans. One of the best example, through the invention of artificial intelligence is that, due to our smart mobiles, we can shop online, as well as many kind of apps are launched through which we can book online tickets for travelling and also search the best places to visit. For students of new generation, the gadgets and invention taking place in the field of artificial intelligence has made them creative, innovative as well as modern.

[21] As the artificial intelligence emerged in the modern world, it helps to collect the large data based on clinical histories very easily. It also helps to share a common presentation related to disease from every field.

[22] The advantage of using an AI-based sizing of Photovoltaic (PV) systems is to provide better expansion, especially in remote areas where the data of atmospheric conditions are not available. For example, we can say that, like, in remote areas, the supply of electricity is not that much possible as compare to those who are living in big cities. So, to resolve this problem, with the help of artificial intelligence, invention of Photovoltaic type of system are evolved, such as solar panels help to generate electricity through the help of sun which can be possible in remote areas as well.

[23] Artificial Intelligence also benefitted the banks to identify the frauds in trading, algorithm-based lending models and many other things also. Creations like CCTV cameras and GPS trackers helped a lot to tolerate many crimes, robbery as well as fraud taking place in many parts of the world.

Challenges or Disadvantages of Artificial Intelligence

[24] The biggest challenge faced by Artificial Intelligence is that, most of the human jobs get affected and unemployment has increased. In some aspects there is also an increment of crime. For example, in big countries like America, Japan, there all the works are taken place through automatic machines, like in hospital, shopping malls, robots help to find all the items successfully through which the manual work gets disappeared, also there is no payment or salary which is provided to the robots by which the unemployment has increased at a drastic rate.

[25] Challenges in acquiring the techniques of Artificial Intelligence is mostly faced in public sectors recognized as key stakeholders. Findings show that different stakeholders have diverse, and sometimes contradictory, framings of the challenges. Most of the people such as farmers, small businessman or the people living in remote areas don't know how to use the advanced technology-based machines also, advanced machines with advanced technology also became very costly which cannot be afforded by common people too. This leads to be the biggest disadvantage of this technology.

[26] To handle too large data efficiently, new techniques, large volume, variety and velocity of this data. Like, sometimes due when the smart devices such as mobile phones, computer or laptops, whenever there is a collection of large data or storage gets filled, the device gets hanged, face some technical issue or stop working which leads to a big problem in our daily lives. Use of the evidence generated were also seen as significant challenges.

[27] The biggest disadvantage faced by artificial intelligence is that it can only perform those functions which are programmed in it, outside of this, it doesn't give any output. It is a big drawback of artificial intelligence. It means that the functions which are coded or programmed in it, it only gives output for those only. Other than that, it has no scope or output. Sometimes, if the programme is coded incorrectly, then also it does not give any output.

[28] There are some social and juristic challenges faced by artificial intelligence. With a focus on torts that are at least partly or seemingly due to artificial intelligence, resulting in the claimant suffering a loss or harm. Sometimes what happened, if some of inventions of artificial intelligence get failed or not get much popular between people or disliked by the common people then artificial intelligence has to faced the social challenge like failure memes on social media and criticism.

Conclusion

From this whole, we can conclude that artificial intelligence has now became a daily part of our life. It has some advantages and disadvantages but it benefits human at a huge aspect by reducing a lot of work and transforming it into a computational process. As far as we can also see that, Artificial intelligence has showed a very drastic and unbelievable growth in every field. Starting from its history, when artificial intelligence was unknown to everyone, it was very difficult for people to be familiar from it. But as time goes on, it shows a fantabulous development in reaching to the whole world. Now, artificial intelligence is common as well as very popular in all over the world. There is not a single field where either the devices or the technology of artificial intelligence is not used, either it is in the field of science, government, security and surveillance, manufacturing and production, healthcare appliances, medical care, entertainment or in the education. Everywhere, artificial intelligence is widely famous and familiar. On the other hand, we can also conclude that the technology of artificial intelligence has made the humans very lazy day by day. Due to invention of many automatic machines, human didn't want to do work at his own. Now, humans want to buy and shop everything online, daily exercise of humans get reduced due to which their physical heath also get affected. Same is seen in students also, students spent most of their time with digital gadgets only, they don't even play outdoor games.

Now a days through the sources of internet and entertainment also, people are trying to spread awareness about how artificial intelligence is very useful as well as beneficial to everyone. Rather in some areas it has disadvantages but slowly-slowly, invention of new technology and creative equipment are trying to overcome its all disadvantages.

References

Aghion, P., Jones, B. F., & Jones, C. I. (2019). *9. Artificial Intelligence and Economic Growth* (pp. 237-290). University of Chicago Press.

Agrawal, A., McHale, J., & Oettl, A. (2019). *5. Finding Needles in Haystacks: Artificial Intelligence and Recombinant Growth* (pp. 149-174). University of Chicago Press.

Baker, M. J. (2000). The roles of models in Artificial Intelligence and Education research: a prospective view. *Journal of Artificial Intelligence and Education*, *11*, 122-143.

Benko, A., & Lányi, C. S. (2009). History of artificial intelligence. In *Encyclopedia of Information Science and Technology, Second Edition* (pp. 1759-1762). IGI Global.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Charniak, E. (1985). *Introduction to artificial intelligence*. Pearson Education India.

Chen, H., & Wang, F. Y. (2005). Guest editors' introduction: Artificial intelligence for homeland security. *IEEE intelligent systems*, *20*(5), 12-16.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

Chen, M., Liu, Q., Huang, S., & Dang, C. (2020). Environmental cost control system of manufacturing enterprises using artificial intelligence based on value chain of circular economy. *Enterprise Information Systems*, 1-20.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Davenport, T. H. (2018). *The AI advantage: How to put the artificial intelligence revolution to work*. MIT Press.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., & Scharre, P. (2018). *Artificial intelligence and international security*. Center for a New American Security.

Johnson, J., 2019. Artificial intelligence & future warfare: implications for international security. *Defense & Security Analysis*, *35*(2), pp.147-169.

Khanna, S., Sattar, A., & Hansen, D. (2013). Artificial intelligence in health–the three big challenges. *The Australasian medical journal*, *6*(5), 315.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. International Journal of Library & Information Science (IJLIS), 9(1), 3.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

McCarthy, J. (2007). What is artificial intelligence?.

Mellit, A., Kalogirou, S. A., Hontoria, L., & Shaari, S. (2009). Artificial intelligence techniques for sizing photovoltaic systems: A review. *Renewable and Sustainable Energy Reviews*, *13*(2), 406-419.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Perc, M., Ozer, M., & Hojnik, J. (2019). Social and juristic challenges of artificial intelligence. *Palgrave Communications*, *5*(1), 1-7.

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education*, *26*(2), 582-599.

Sun, T. Q., & Medaglia, R. (2019). Mapping the challenges of Artificial Intelligence in the public sector: Evidence from public healthcare. *Government Information Quarterly*, *36*(2), 368-383.

Szolovits, P. (Ed.). (2019). *Artificial intelligence in medicine*. Routledge.

Wagner, J. B. (2019). Artificial intelligence in medical imaging. *Radiologic technology*, *90*(5), 489-501.

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. *Materials Horizons*, *2*(2), 140-156.

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. *Materials Horizons*, *2*(2), 140-156.

ARTIFICIAL INTELLIGENCE IN REAL LIFE

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What is Artificial Intelligence?

[1] Artificial intelligence is the science and engineering of manufacturing intelligent machines mainly intelligent computer programmes. It is as same as using computers so they know about human intelligence which is not biological.[2] Artificial intelligence have divided the topic into its major areas of operations such as natural language processing, robotics, machine vision, automatic theorem proving, intelligent data retrieval systems, etc. The main difficulty with this is to approach these application areas are now so extensive, that each could, at best, be only superficially treated in a book of this length. Artificial intelligence ideas that comes under many of these applications. Organization of these ideas is not, then, based on the subject matter of their application, but is, instead, based on general computational concepts involving the kind of data structure used, the types of operations performed on these data structures, and the properties of control strategies used by the artificial intelligence

History of Artificial intelligence

[3] Artificial intelligence is introduced to define the ability to interpret external data correctly, to learn from such data, and to use learning which help to achieve specific goals and task.[4] In history, artificial intelligence is used in finding philosophy, fiction and imagination. Early invention in electronics, engineering and many other disciplines have influenced artificial intelligence.

Growth of Artificial Intelligence

[5] Recently, growth of artificial intelligence, and its implications for understanding human behavior. The range of possible association between sociology and artificial intelligence reflects the extent to which we are wiling to adopt the features of artificial intelligence.[6] the effects of Artificial intelligence depend on a major extent of institution and politics. Artificial intelligence surplus the growth by replacing labor by capital, both in the production of goods and services and in the production of ideas.

AI in Health Care Appliances

[7] Artificial intelligence in health care have effectively enhances the quality of telecare and save medical resources for reasonable distribution and full application so that self-health can enhance and reduce the outpatient visits and save the outpatient time as well as expenditure.[8] Artificial intelligence is used to measure the stress level especially TTH (Tension Type Headache) which is a serious problem in today's world. To measure the stress level, the concept of EEG, EMG and GSR are introduced. In TTH, human is in a state in which one experiences pain like a physical weight or a tight band around his head.[9] Due to lack of social care support, there is an arise of cost-effective assistive healthcare technology for taking care of the elders and giving them best tech-friendly experience.

AI in Manufacturing and Production

[10] Agriculture area and food production are facing increasing pressure from climate change, land and water availability, and most recently pandemic. Thanks to artificial intelligence, we can now quantify field scale phenotypic information accurately and integrate the big data. Artificial intelligence has improved the resilience of agriculture systems. [12] To promote sustainability, smart production requires global perspective of smart production application technology. There are many AI-based techniques, such as machine learning, have already been established in the industry to achieve sustainable manufacturing.[13] Artificial intelligence is used to build intelligent systems, no matter whether utilized in an industrial or private environment. AI- based have been proposed for the increasingly important electric drives production.

AI in Security and Surveillance

[14] Asignificant application of artificial intelligence is intelligent surveillance, which aims to interpret automatically human activity and detect unusual events that could pose a threat to public security and safety. [15] Security cameras and video surveillance system have become important for security purpose. The detection of high-risk situation through these systems are still performed manually in many cities. The lack of manpower in the security sector and human cannot detect danger or delay in detecting threats. The main purpose is to develop a low-cost, efficient and artificial solution for the real-time detection. [16] Surveillance is the process of close observation of a person, place, or object to avoid and minimize the risk of any undesired dangerous situation to maintain normalcy. The use of information and communication technologies have increased the level automation and have made it a part of surveillance application. The aspects of automation have greatly reduced human intervention and have made systems more reliable and efficient.

Artificial Intelligence in Education

[17] Artificial Intelligence have been shown to be highly effective at increasing students' performance and motivation. As in ITS for economics, performed equally well as student taking a traditional economics course, but required half as much time covering the material. [18] Artificial Intelligence in education is concerned with development of artificial Intelligence techniques for the study of human teaching and for the engineering of system that facilitate human learning. It is used to explore and evaluate alternative theories about learning. [19] Artificial Intelligence in education department provides an overview of both the classic and emerging architectures, pointing to the many aspects of Artificial Intelligence that play an important role in creating these systems.

Advantage of Artificial Intelligence

[20] Artificial Intelligence applications are utilized to simulate human intelligence for either solving a problem or making a decision. Artificial Intelligence provides the advantages of permanency, reliability and costeffectiveness while also addressing uncertainty and speed in either solving a problem or reaching a decision. [21] Major advantage of artificial intelligence is that its decisions are based on facts rather than emotions. It is well-known fact that human decisions are always affected in a negative way by our emotions. Unlike humans, machines do not need any sleep. [22] Industrial revolution attempted to create machines that could replace man's physical power. It is one time investment and have make the easy and simple. [23] Artificial Intelligence has the ability to detect and diagnose faults of building energy systems. This paper aims at making a comprehensive

literature review of artificial intelligence-based fault detection and diagnosis (FDD). They showed powerful capacity in learning patterns from training data. [24] Due to rapid advancement of technology, artificial intelligence has been a thriving area in different fields, including medicines. Gastroenterology AI software has been included in computer-aided systems for diagnosis and to improve the assertiveness of automatic polp detection and its classification as a preventive method for CRC.

Disadvantages or Challenges of AI

[25] Some time it can be misused leading to mass destruction. Programme mismatch sometime done opposite to the command, unemployment increases. Younger generation is becoming lazy. Technology dependency increased. [26] It is not an easy task to develop the machine because the equipment are also expensive. Machines can easily cause destruction, if put within the incorrect hands. Artificial Intelligence is making human lazy with its applications. [27] Talent training programs, the training of artificial intelligence awareness and ability has not been really incorporated into vocational education, which has affected the development of professional talent training objects. If the training goal of artificial intelligence is not included in the professional education plan. [28] Challenges of artificial intelligence in healthcare are informed consent to use, safety and transparency, algorithmic fairness and biases and data privacy. Legal challenges are safety and effectiveness, liability, data protection and privacy, cybersecurity and intellectual property law. [29] New technologies that are fusing physical, digital and biological worlds, impacting all disciplines, economics and industries. These rapid and abrupt changes in society that radically changed human life and occurred in a certain period of time.

Conclusion

Artificial Intelligence, as per name, we can imagine the intelligence which is artificial or man-made. Artificial Intelligence is the science of making intelligent machines.

Growth of artificial intelligence is increasing rapidly by replacing labour by capital, both in the field of growth and production. Artificial intelligence has the quality in the field of telecare and save medical resources. It is also used to measure stress level.

It has also help in the field of agriculture as this area and food production area are facing increasing pressure from climate change, land and water availability, and pandemic. Machines are also very helpful for agriculture which have increase the rate of productivity and decrease the stress level of farmer.

In security, purpose it is very important which aims to interpret automatically human activity and detect unusual events that could pose a threat to public security and safety.

For students also it is highly effective. As at the time of Covid-19, all work process is going online and student's study also. And now students can understand easily with the help of artificial intelligence.

Artificial intelligence applications are used to solve a problem or decision making.It had also replaced man's physical power and has ability to detect and diagnose faults. Artificial intelligence make decision based on the facts rather than emotion.

Besides this, there are some disadvantages of artificial intelligence as younger generation is becoming lazy. It will destructive when come in wrong hands.Technology dependency increase. These rapid changes in society had changed human life also.

References

A Mayr, M Weigelt, M Masuch, M Meiners, F Hüttel… - … Manufacturing, 2018 – Elsevier

AI Strong - Science [ETEBMS-2016], 2016 - test.globalinfocloud.com

B Woolf - 1991 - cs.umass.edu

BG Buchanan - Ai Magazine, 2005 - ojs.aaai.org

D Ganesh, G Seshadri… - … and Informatics (IC3I …, 2019 - ieeexplore.ieee.org

G Huang, LUO Yu-Zhou, Q Zhi-Wang - Revista de Cercetaresi …, 2019 - ceeol.com

J Beck, M Stern, E Haugsjaa - XRDS: Crossroads, The ACM Magazine …, 1996 - dl.acm.org

J Borah, KK Sarma, PJ Gohain - Smart Devices, Applications, and …, 2019 - igi-global.com

J Jung, M Maeda, A Chang, M Bhandari… - Current Opinion in …, 2021 – Elsevier

J Kay - IEEE Intelligent Systems, 2012 - ieeexplore.ieee.org

J McCarthy - 2007 - 35.238.111.86

KCA Khanzode, RD Sarode - … of Library & Information Science (IJLIS), 2020 - academia.edu

M Chowdhury, AW Sadek - Artificial intelligence applications to …, 2012 - onlinepubs.trb.org

M Guo - proceedings-online.com

M Haenlein, A Kaplan - California management review, 2019 - journals.sagepub.com

M Viscaino, JT Bustos, P Muñoz… - World Journal of …, 2021 - ncbi.nlm.nih.gov

NJ Nilsson - 1982 - books.google.com

P Aghion, C Antonin, S Bunel - Economie et Statistique, 2019 - persee.fr

R Cioffi, M Travaglioni, G Piscitelli, A Petrillo… - Sustainability, 2020 - mdpi.com

R Rastogi, DK Chaturvedi, M Gupta - … Intelligence in Healthcare …, 2020 - igi-global.com

S Bhbosale, V Pujari, Z Multani - Aayushi International …, 2020 - researchgate.net

S Dimitrieska, A Stankovska… - Economics and …, 2018 - ideas.repec.org

S Gerke, T Minssen, G Cohen - Artificial intelligence in healthcare, 2020 - Elsevier

S Gong, CC Loy, T Xiang - Visual analysis of humans, 2011 – Springer

S Mogali - … on Information Technology: Yesterday, Today and …, 2014 - researchgate.net

S Woolgar - Sociology, 1985 - journals.sagepub.com

S Xu, K Hung - 2020 IEEE 10th Symposium on Computer …, 2020 - ieeexplore.ieee.org

Y Zhao, T Li, X Zhang, C Zhang - Renewable and Sustainable Energy …, 2019 – Elsevier

AN INSIGHT INTO ARTIFICIAL INTELLIGENCE

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What is AI?

[1]The branch of computer science which involves the study of the relationship between perception and computation is known as artificial intelligence. Programs are written in order to receive some intelligent behavior. Programming languages are considered as the most important tools in AI since these help in solving certain kinds of problems. The programs are conceived and implemented in the programming languages. [2]The branch that fills the gap between scientists of human characters and the computer scientists is known as artificial intelligence. It can also be stated as the attempt to make computers intelligent. The goal of artificial intelligence is to enable computers to accomplish tasks that humans are good at.

History of AI

[3]The birth of AI can be traced at 1942, when Isaac Asimov, an American Science Fiction writer, had published his story 'Runaround' which was about a robot evolving with the 'Three Laws of Robotics'. This story inspired many scientists in the field of AI. At roughly the same time Alan Turing, an English Mathematician developed 'The Bombe', generally considered as the first working electromechanical computer which was a code breaking machine for the British government mainly used for deciphering the Enigma code used by the German in World War 2. This machine's ability made Turing wonder about intelligence of such machines. In 1950, the article 'Computing Machinery and Intelligence' was published by him where he mentioned how to create intelligent machines and test their intelligence. This Turing Test is the benchmark even today to identify intelligence of an artificial system. The word 'Artificial Intelligence' was then coined officially in 1956 when Marvin Minsky and John McCarthy (who were scientists) had hosted the 'Dartmouth Summer Research Project on Artificial Intelligence (DSRPAI) which marked the beginning of the AI Spring. The goal of DSRPAI was to reunite researchers from other fields to create a new research area which aimed at building machines that are able to simulate human intelligence. [4]The founding father of the branch of AI was Alan Turing who was a British logician and mathematician. He had published an article 'Computing Machinery and Intelligence' which began with the question 'Can machines think?'. This article had inaugurated the philosophy of AI. He had declared that by the end of the century 'the use of general educated opinion and words will alter so much that one can speak of machines thinking without expecting to get contradicted'. In 1936, he had written (almost by accident) a paper on the logical foundations of a computer design. In the article he was mainly concerned with an abstract problem in mathematical logic and while solving it, he managed to invent in concept, the stored program general purpose computer which are nowadays known as Turing machines. During war, Turing worked as a codebreaker at Bletchley Park and this made them win the war with the help of Turing machines. This accidental discovery of an imaginary computer dominated Turing's professional life and he passionately involved to the development of real machines.

Growth of AI

[5]Due to significant investment globally from both public as well as private, there has been development, implementation and adoption of AI. Many countries have implemented national strategies to get leadership and advantages in the development of AI. This is because development in AI is considered as the crucial factor to the national growth. Such developments are likely to be adopted to the benefits of the nations. This rapid advancement and investment in AI is popularly known as 'AI race'. [6]Industries, media and political organizations showed a good interest in AI in the recent years as applications and research in the field of AI are increasing everywhere. The industries are interested in the potential applications of AI. In July 2016, a report stated that many IT giants have acquired about 140 entrepreneurial firms in AI since 2011. 200 AI related companies have raised over 1.5 billion dollars in the stock market in the first six months of 2016.

AI in Healthcare Appliances

[7]There is a great hope that AI surpasses human performance in healthcare. AI makes it possible for better detection, prevention, diagnosis and treatment of the diseases. Cancer, neurology, diabetes and cardiology use AI tools. AI is helpful in automatically detecting problems and the threats to the patient safety with high accuracy and speed. Research of AI is in process to provide a more unified healthcare delivery. [8]AI techniques have risen rapidly in healthcare , which even rose the question of whether there will be AI controlled doctors rather than human physicians in the future. This might not be possible but however it is quite possible that AI would assist human physicians which would enable them to make better clinical decisions and can even replace human judgement in few areas of healthcare like radiology. Some achievements of AI in the area of healthcare includes the increasing availability of healthcare data and unlocking clinically relevant info which is hidden in massive amount of data through powerful AI. [9]AI is beginning to be applied in healthcare since these have the potential to transform aspects of patient care, the administrative processes with the pharmaceutical organisations, provider and the payer. Research suggests that AI would be performing better than humans in key healthcare tasks. Even today, algorithms are outperforming radiologists in spotting tumours and are guiding researchers for costly clinical trails.

AI in Manufacturing and Production

[10]The application of AI in industries has enhanced quality control (eg: turbofan blades can be inspected in 3D by the manufacturer with micrometer precision),enabled predictive maintenance (eg: failure can be stopped in equipments by spotting even subtle changes with the help of networked sensors), reduced energy and material costs ,inventory optimization, product design (eg: aircraft parts were created by airbus that are much lighter than those designed by humans), improved safety, and environmental performance. [11] AI helps in analyzing ,monitoring and making better decisions rather than human operators which benefits smart manufacturing whose technologies includes industrial connectivity devices and services, big data processing capabilities and robotic systems. In this way, it changes the method in which the products are manufactured, packed, shipped and finally sold. The final goal is to build machines that have intelligence like humans in order to do the decision making process. [12] AI is being applied in the field of intelligent manufacturing which is a new manufacturing model. This facilitates the production and thus provides high quality, high efficiency, environment friendly and cost effective service for the users which improves competitiveness in the market of the manufacturing groups. AI also helps in developing new models, system architecture and technology systems in the area of intelligent manufacturing.

AI in Security and Surveillance

[13] AI has the ability to monitor the flow of video data and the data collected from large number of sensors and thus can warn about any suspicious activity to the security services. If polices have AI in high quality computer systems then their routine office work would rather be done by those computers and there can be increase in the presence of police in urban areas. Today, polices are already taking the help of robots in various activities which include disposing explosive devices, conducting search and rescue operations and also in destroying armed criminals. [14] Development of AI would impact national security in three areas which are information superiority, economic superiority and military superiority. In information superiority, AI would enhance capabilities for the creation, analysis and collection of data while in the case of economic superiority, progress in AI would result in an industrial revolution. In the case of military superiority, advances in AI will enhance the affordability of existing capabilities as well as produce new capabilities. [15] AI technologies also help militaries by making the defense leaders understand better about their own forces. These help in identifying stress on the force in various areas like when service members can suffer with low performance or have any physical or psychological injuries, when their equipments would require maintenance and when programs can suffer cost overruns or schedule delays. With this, we can say that AI has the potential to do predictive analysis and bring up the readiness of forces of the defense leaders.

AI in Education

[16] Study shows that AI is implemented in education in various forms. Using these facilities teachers are performing different administrative functions, such as grading and reviewing students assignments more effectively and efficiently, and increase the quality of their teaching activities. [17] To teachers, many of the AI systems that have been developed are mostly delivered through computers and to instructors they leave no real part to play in the use of the system. As a consequence, AI currently has little or no part of the activities in a classroom [18] There has been an increase in the interest in improving and understanding the adoption of AI techniques in the field of education in both educational institutions and government sectors. Applications and tools driven by AI technologies, is being used by educators and learners within both K-12 and university contexts. AI technologies help in providing personalized learning in order to meet the individual's needs.

Advantages of AI

[19] Simulation of human intelligent activity can be done.It organizes effectively various resources so that information data can meet the sharing and transmision needs of different users. It has an excellent reasoning and learning ability in the network intelligence. It improves the network operation management level and the efficiency of information processing. [20] It makes the network management have the ability of information processing. It manages and controls better the uncertainty information ,thus improving the network system. It shows better collaboration between all management levels. It has improved the teaching effect. [21]AI can mimic human intelligence for making decisions or solving problems. It has the advantage of reliability, permanency and cost-effectiveness while also addressing speed solving problems or making a decision. [22] The decisions of AI are based on facts rather than emotions is one of the major advantage of it because it is well known that the human decisions are affected by our emotions in a negative way. Machines containing AI do not need any sleep thus overcoming the disadvantage of tiredness in humans. [23] With the help of AI , human works are reduced since they are replaced by machines, thus making them focus on others works. AI is like a cheap labor with which our work will be done fast and the profit gets increased.

Challenges or Dis-advantages of AI

[24] It was predicted that AI would destroy 5 million jobs in the upcoming five years. Some gains in energy , resources and time-savings will be nullified by AI. AI increases the competitive pressure. If fallen in wrong hands, hackers and terrorists get the ability to manipulate and access through security holes in the network protocols. [25]. Disadvantages of AI is that since the equipments are expensive, it is not easy to develop the machines. Also it costs tons of money and time to create , repair and rebuild. Robotic repair can scale back time but that rather costs extra money and resources. [26] Limitation of AI search methods is that they never guarantee to reach the optimal solution. Also when using such methods to solve a problem, it is difficult to gain true insight into the problem such as when using mathematical programming methods. Sensitivity analyses cannot be done quickly which is an important example of this limitation. [27] Disadvantages of AI include lack of creativity in responses, unable to explain the reasoning and logic behind a certain decision. In current stage ,AI cannot predict when there is no possible solution to a particular problem. Malfunctioning of AI machines can lead them to produce wrong solutions to problems which justifies that blind reliance on AI can lead to problems.It can also cause large scale destruction if it is given in the hands of wrong person. [28] There are few main disadvantages of AI which are stated as follows. If a program is sometimes mismatched, it would do opposite to what is actually mentioned in the command. AI affects human jobs due to which the problem of unemployment increases. Since AI lack human touch, it makes the younger generation to become lazy in doing their work and depend on technology.

Conclusion

From the above insight we can conclude that AI is going to dominate the upcoming generation. It is currently being used in every fields with development simultaneously and will continue to be used everywhere. Just like other things, AI has its own advantages and disadvantages but the advantages seem to be dominating over the disadvantages as there is a lot of improvement in it over time. Thus, there is no doubt that it will make a great impact on the society as everyone will almost completely depend on AI in their daily lives in the upcoming future.

References

Akerkar, R. (2014). *Introduction to artificial intelligence*. PHI Learning Pvt. Ltd..

Allen, G., & Chan, T. (2017). *Artificial intelligence and national security*. Cambridge, MA: Belfer Center for Science and International Affairs.

Barr, A., & Feigenbaum, E. A. (Eds.). (2014). *The Handbook of Artificial Intelligence: Volume 2* (Vol. 2). Butterworth-Heinemann.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *Ieee Access*, *8*, 75264-75278.

Chen, X., Xie, H., Zou, D., & Hwang, G. J. (2020). Application and theory gaps during the rise of Artificial Intelligence in Education. *Computers and Education: Artificial Intelligence*, *1*, 100002.

Chowdhury, M., &Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Copeland, J. (2015). *Artificial intelligence: A philosophical introduction*. John Wiley & Sons.

Crandall, D. J. (2019). Artificial intelligence and manufacturing. *Smart Factories: Issues of Information Governance*, 10-16.

Davenport, T., &Kalakota, R. (2019). The potential for artificial intelligence in healthcare. *Future healthcare journal*, *6*(2), 94.

Ertel, W. (2018). *Introduction to artificial intelligence*. Springer.

Haenlein, M., & Kaplan, A. (2019). A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. *California management review*, *61*(4), 5-14.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., &Scharre, P. (2018). *Artificial intelligence and international security*. Center for a New American Security.

Jiang, F., Jiang, Y., Zhi, H., Dong, Y., Li, H., Ma, S., ... & Wang, Y. (2017). Artificial intelligence in healthcare: past, present and future. *Stroke and vascular neurology*, *2*(4).

Khanzode, K. C. A., &Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

Mohammadi, V., &Minaei, S. (2019). Artificial intelligence in the production process. In *Engineering tools in the beverage industry* (pp. 27-63). Woodhead Publishing.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Pan, Y. (2016). Heading toward artificial intelligence 2.0. *Engineering*, *2*(4), 409-413.

Radulov, N. (2019). Artificial intelligence and security. Security 4.0. *Security & Future*, *3*(1), 3-5.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Sun, W., Li, C., & Ren, R. (2019, June). Artificial intelligence and its application in computer network technology. In *Journal of Physics: Conference Series* (Vol. 1237, No. 2, p. 022142). IOP Publishing.

Timms, M. J. (2016). Letting artificial intelligence in education out of the box: educational cobots and smart classrooms. *International Journal of Artificial Intelligence in Education*, *26*(2), 701-712.

Walsh, T., Levy, N., Bell, G., Elliott, A., Maclaurin, J., Mareels, I., & Wood, F. (2019). *The effective and ethical development of artificial intelligence: an opportunity to improve our wellbeing*. Melbourne, Australia: Australian Council of Learned Academies.

Zhu, D. (2017). Analysis of the application of artificial intelligence in college English teaching. *Advances in Intelligent Systems Research*, *134*, 235-237.

THE WORLD OF AI

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What is Artificial Intelligence?

[1] Artificial intelligence is the complete knowledge behind the intelligent machines; it is used in building up machines which have higher order thinking capacity and work on computer programming. It focuses on how to make robots and machines think like humans. [2] since we know that intelligence is very essential , inducing it in machines enables that particular entity to work at its greater potential.AI machines can be used to enhance many sectors of life like healthcare, education, manufacturing, security etc. And make the world smarter than ever before

Brief History and Growth of Artificial Intelligence

[3] Just the thought of having a mechanical assistant, centuries ago, led to the current discovery process of AI. It was only in the last half century the process of implementation of AI has begun (i.e. building up machines which have the capacity to think). In the past many philosophers like Rene Descartes and Gottfried Wilhelm Leibniz had different thoughts and imaginations of machines which work on intelligence. Even though, at that time Leibniz and Pascal designed the calculating machines they never thought that the devices could think. As these thoughts were spreading more, people started to dig into it. Even the science fiction writers have used this idea of intelligent machines in their writings. For example, L. Frank Baum wrote the Wizard of Oz. In which he took the robots as characters, which resembled humans. All these made people curious about the world of AI. In the early twentieth century development in electronics and the modern computers (which were also referred as giant brains) created a good opportunity to build AI machines. A major breakthrough in AI development was Turing's 1950 seminal paper in the journal 'Mind'. The paper explained how a computer can be programmed to think intelligently and he also provided the Turing's test, the next year AI based first program was written. [4] And after 5 years (in 1956) artificial intelligence, with proper structure and foundation, was introduced by John McCarthy (also known as father of AI). The next year, the first general problem solver was successfully tested and paved the way for the development of AI It was when people started to show complete interest towards AI. [3] Robots were invented that time, but inducing common knowledge into them became a tricky task. In the process of research Isaac Asimov in 1942 gave the three famous laws of robotics. And after the development of AI started, the first autonomous vehicle was created in the Stanford AI lab. [4] At the initial stage everyone believed that AI will be doing the work which human beings can do, but according to scientists it was impossible for this to happen, so after more research they came to a conclusion that Artificial intelligence is nothing but making intelligent machines which can help humans to complete a given task faster with ease. And now researchers and programmers are working more in bringing AI to its higher potential. [3] And even AI started to fall in the eyes of the people of different disciplines (such as, engineering, biology, psychology, mathematics, logic.etc), and therefore led to the increase in its applications. Now AI started to help many fields and enhanced the lifestyle of many.

AI in Health Care Appliances

[5] As we all know healthcare is vital for human life, introducing artificial intelligence in healthcare will be extremely helpful. The way it analyses the given data and gives suggestions is very accurate. It is a very useful tool to increase the efficiency and reduce the cause of damage.

[6] The major benefits of artificial intelligence in healthcare sector are it detects any problem well in advance so that patients can take necessary precautions, it gives risk analysis of a particular problem, its accurate and detailed imaging technique helps in better study of the problem, and it also reduces the health care costs. It is also used in identifying and collecting the data about new viruses and diseases. It does many jobs from taking the required information from the patient to the end of the process. [7] The most important use of AI in healthcare is its ability to manage the data perfectly. Since, many patients admit into hospitals everyday it is very important to manage their data properly. It gathers important information related to the patients by analysing their data. It also helps in storing a huge amount of data safely. And by making it very easy for the people in hospital to refer the details of a particular patient. It also does the repetitive jobs like taking X-rays, CT-scans and data entry perfectly.

It is also provides advanced healthcare treatment by upgrading the treatment tactics, analyzing the data to give accurate treatment and monitoring the treatments carefully in order to avoid any miscalculations.

[8] The learning health systems (LHS) and of AI in medicine have many common points. In order to make AI's applications more effective there needs to be improvement in data sharing and infrastructure, it should work more on giving personalized care, and it should try to remove traditional obstacles that patients face while receiving the treatment.

[7] Still there are different processes going on to improve the reasoning capabilities and to induce extensive range of medical knowledge in AI machines, which they hope will improve the medical field. And save more lives of people.

AI in Manufacturing and Production

[9] Over the last few decades, machines with AI technologies have become very important for manufacturing and production.AI not only improved production but also the economy of the country. In the modern manufacturing, industrial artificial intelligence (IAI) has become the core system of smart manufacturing. AI powered manufacturing majorly improved closed-loop production chains. Particularly, IAI based knowledge enhanced the modern manufacturing process. And the advanced properties of AI took the manufacturing to a greater level.

[10] AI provides higher efficiency and quality in production. It improves the production and makes the manufacturing process quicker, easier and effortless. It also reports the quality of the product and makes sure the consistency in production is good. Its environment-friendly service helps users in production. The process of manufacturing requires many things such as sensors, interconnections, collaboration, analysis, decision making and control systems. These all requirements are well managed by AI and hence removing a huge workload from humans.

[11] In this modern world, manufacturing and logistics systems are increasing rapidly because of the powerful computing networks. With raising capabilities, this Big Data is being updated and analysed deeply. These properties increased the demand of AI and introduced us to a new age called smart factory.

AI in Security and Surveillance

[12] AI has wide range of application in security and surveillance. It helps in providing very good security in varies places such as cyber networks, information storage, national defence, and in many other confidential areas.

[13] The role of security and surveillance is very essential in national defence, and therefore AI can be very useful in these areas. The critical mission areas such as border security, Domestic counter terrorism, protection of critical infrastructures, defending against sudden terrorism and emergency preparedness requires a lot of intelligence. And this can be possible with the help of AI. It makes sure that all these areas are safe and also gives various types of warnings at emergency situations by analysing the data.

[14] As there is a lot of progress in this modern world, there arises the necessity to keep confidential data safely. Non ethical hackers can get access to personal data and cause threat.

That is where AI comes in. AI can help in providing stronger security, it detects if there is any problem and gives alerts well in advance. Therefore by providing a safer environment in the smart world.

AI in Education

[15] AI can be very useful in education in various activities like planning, administration knowledge representation and explanation. Its use in the education can enhance the process of studying.

[16] Computer based training (CBT) and computer aided instruction (CAI) were the systems used in tutoring via computers. These are the core systems which are used in the smart education.

[17] AIED (Artificial Intelligence in Education) includes everything like personalized dialogue systems, AI explanatory learning, game based environment, student support chatbots.etc which makes the studying process more comfortable and easier. The smart environment helps students to be educated effectively. AI improves the quality of education and makes studying process fun and comfortable. And the most important thing is the application of AI in grading students by their performance. AI not only helps student but even teachers and staff. Correcting the exam papers of students is a huge task for teachers, their whole time gets into it and they may not be able to focus more on improving the interaction between the students. Therefore, AI in this situation is very helpful, it can correct the papers, and it can grade students and make the teachers work simple and easier.

[16] These systems may be effective but the individual attention given by a physical tutor has its own benefits. Anyhow it reduces the work load and makes the education process smoother.

Advantages of AI

AI is introduced into this world only because of its advantages. Here are some advantages of AI.

[18] AI doesn't have any emotions. It only works on facts. Whereas, we humans have a lot of emotions which affects us while taking any critical decision. The machines only work what is true according to its code and cannot be influenced by any.

Humans cannot work continuously 24/7 but the machines can work continuously without getting tired. The consistency in their work is uniform throughout a given task. They can take up different types of task without any difficulty or pressure.

Sharing the knowledge between different machines is seamless process. For completing huge work we need help of many people, people who have knowledge about the task, so we have to

educate them, which is a lengthy process. Whereas, in machines we can just copy the code and make the other machines work on the same task.

[19] AI is faster than humans. Any given task is completed very fast by AI.

It also processes complex work easily without any difficulty. Human beings can do complex work but it is very stressful. Whereas, AI completes it seamlessly and the errors made by it are negligible.

[20] By using AI in areas where it is dangerous for human beings we can save many lives. Example like mining, fuel exploration, defence related areas which are life threatening. We have seen many incidents where people lost their lives while working at these areas. Therefore, we can replace them with robots which do the similar work but this time there would be no risk for human life.

Not only in industries but also in education, e-commerce, safety and security, social media, etc. AI is utilised.

Therefore AI has got many advantages and can completely change the future upcoming world

Disadvantages of AI

AI is not introduced into the world completely because of its disadvantages. Here are the disadvantages of AI.

[21] AI sometimes can be used in an inappropriate way in hands of few, which can lead to huge problems. We live in a world where there are different kinds of people with different mindsets. What may be correct for ones may not be the same for others.

We saw many advantages of AI as it can replace humans in different areas. But the problem here is growth of unemployment. And we can also see the rapid growth in the population these days.

Since the machines totally work program based, we have to be very careful because program mismatch sometime makes the bots or machines do opposite things which can be dangerous.

The younger generation will become lazy because they will totally dependent upon AI and forget the importance of living.

[22] Equipment required to design these machines are expensive. It costs huge amount to create and repair these machines. Therefore development in AI didn't even start in many regions.

[23] AI can be fast but the natural intelligence has better ability to think than AI. Some of the decisions cannot be done by AI. AI is the subset of our intelligence, only its mechanism makes it quicker.

In order to use AI efficiently it has to be explored in more depth.

Therefore these are some disadvantages in AI which are to be taken under consideration for future workings on AI.

Conclusion

The artificial intelligence has completely changed the world. It has influenced each and every sector of the society; from education to healthcare. It made humans work simple and easier. It enhanced the lifestyle of different people. And what we are seeing is just the beginning of AI. AI can further be used in an unimaginable way; it has a lot of potential. It requires more research and experimentations on this field. AI has its own pros and cons, the research should be done considering all these factors. And according to some assumptions many are stating that in the future AI will conquer the whole world. And people will completely depend on AI.

According to me AI should be developed but my only concern is that it will lead to a lot of unemployment, ofcourse people who have invested in and working on it have profit but the ones whose jobs are going to be replaced in future will have a lot problem. They will have no work in future which cuts off their income source and makes the poor poorer. So I would say Balancing both employment and development of AI we have to take the next step.

References

Bartoletti, I. (2019, June). AI in healthcare: Ethical and privacy challenges. In *Conference on Artificial Intelligence in Medicine in Europe* (pp. 7-10). Springer, Cham.

Beck, J., Stern, M., & Haugsjaa, E. (1996). Applications of AI in Education. *XRDS: Crossroads, The ACM Magazine for Students*, *3*(1), 11-15.

Benko, A., & Lányi, C. S. (2009). History of artificial intelligence. In *Encyclopedia of Information Science and Technology, Second Edition* (pp. 1759-1762). IGI Global.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Chen, H., & Wang, F. Y. (2005). Guest editors' introduction: Artificial intelligence for homeland security. *IEEE intelligent systems*, *20*(5), 12-16.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Ding, H., Gao, R. X., Isaksson, A. J., Landers, R. G., Parisini, T., & Yuan, Y. (2020). State of AI-based monitoring in smart manufacturing and introduction to focused section. *IEEE/ASME Transactions on Mechatronics*, *25*(5), 2143-2154.

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education. *Boston: Center for Curriculum Redesign*.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., & Scharre, P. (2018). *Artificial intelligence and international security*. Center for a New American Security.

Kasperbauer, T. J. (2021). Conflicting roles for humans in learning health systems and AI-enabled healthcare. *Journal of Evaluation in Clinical Practice*, *27*(3), 537-542.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

McCarthy, J. (2007). What is artificial intelligence?.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Nilsson, N. J. (2009). *The quest for artificial intelligence*. Cambridge University Press.

Racine, E., Boehlen, W., & Sample, M. (2019, September). Healthcare uses of artificial intelligence: Challenges and opportunities for growth. In *Healthcare management forum* (Vol. 32, No. 5, pp. 272-275). Sage CA: Los Angeles, CA: SAGE Publications.

Srivastava, S., Bisht, A., & Narayan, N. (2017, January). Safety and security in smart cities using artificial intelligence—A review. In *2017 7th International Conference on Cloud Computing, Data Science & Engineering-Confluence* (pp. 130-133). IEEE.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Teng, X. (2019, April). Discussion about artificial intelligence's advantages and disadvantages compete with natural intelligence. In *Journal of Physics: Conference Series* (Vol. 1187, No. 3, p. 032083). IOP Publishing.

Woolf, B. (1991). *AI in Education*. University of Massachusetts at Amherst, Department of Computer and Information Science.

THE "NEW -FUTURE WORLD"DRIVING FORCE

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Intoduction

[1]AI is going to be the future driving energy which is going to control the whole world may be harmful or harmless, but it all depends on our hands and how we use it.

What is AI

[2] It is the branch of computer science that helps in building smart engines into machines. [3] To acknowledge human necessities and solve their problems. [4] These do not perform human biological functions which is the necessity for these smart machines.

History of AI

[5] Warren McCulloch and Walter Pits in 1943 where the first people to give the idea on creating artificial neurons. [6] The term Artificial Intelligence was coined by John McCarthy at the Dartmouth Conference which happened in the year 1956. [7] Programming languages like Fortran, Lisp, Cobol were invented so the enthusiasm in AI started increasing among the scientists. [8] In 1966 Joseph Weizenbaum programmed the first chat box "Eliza". [9] Japan created the first humanoid robot named "Wabot-1". [10] From 1974-1980 many countries stopped funding the AI.

Growth of AI

[11] In the year 1980 "Expert system" which was programmed for decision making ability. [12] In 1997 Deep Blue Company created by IBM defeated the world chess champion Gary Kasparov and earns the name of the first computer to defeat human. [13] "Roomba" an AI vacuum cleaner entered the household. [14] Companies like Facebook, Twitter started using AI for developing social media platforms. [15] Watson created by IBM had won Jeopardy, an American quiz show which proved that it could understand human language and to think and solve riddles. [16] In the year 2012 Google had developed "Google Now" to show the results according to the owner or user. [17] In the year chatbot "Eugene Goostman" had won a Turing test (a test to check whether AI can think like humans and act efficiently ornot). [18] "The Project Debater designed by IBM" debated extremely well with two expert debaters and won. [19] Now the whole world is practically running because of AI from performing the household chores, paying money, and travelling somewhere.

AI in Healthcare Appliances

[20] AI has been playing a major role in medical field and has made the work for doctors, lab technician, other staffs, and the patient's life easier and in easy diagnosis. [21] The patients records can be saved easily in the hospital's data records instead of maintaining a handwritten file which may get lost, or data may get damaged at any time. [22]AI delivers the result of the patient online itself most of the time. [23] For example, when we test for covid our result used to appear in the web portal. [24] When blood sample is collected in olden days people used to observe it in the microscope and sometimes negligence can cause a great error but nowadays when the blood samples are put in certain machines it shows the required result and sometimes DNA report can also be

generated using the machine. [25] Many technologies have been developed in which surgeries are being performed by the humanoid robots, it shows photos and images of patient during the operation for the doctor to see and operate accordingly(Laser operation). [26] When MRI, ultrasounds ,CT ,X-Ray and such scans are done the images and their reports are generated immediately so that diagnosis can be started quickly without further delay.[27]AI has also improved the health and hygiene of doctors and patients as sometimes machines perform the required diagnosis for the patient and doctors need not touch the patient unnecessarily to avoid the infection spread from doctors to patient or from doctor to patient(for example dialysis).[28] Mistakes bound to happen in AI but can be rectified or reduced and should be used effectively.[29]Monitors placed near the patients displays and monitor their pulse, heart rate ,oxygen level and so on.

AI in Manufacturing and Industries

[30] AI is the key which helps in opening and expanding the manufacturing industries. [31] AI equipped machines have proved to be working efficiently with minimum or no mistakes. [32] Forexample, in cutting the edges, designing with perfection as inputted but humans tend to make mistakes in cutting and in designing the required material. [33] Machines do not lose concentration and do not need a break like humans until the machine is in proper condition and there is continuous power supply. [34] It is said to reduce the deaths or injuries when designing without proper safety measures. [35] Forexample, in blast furnace if a human does the work without proper safety equipment itcan poses a great threat to his life but if a machine does it at least a human life can be saved. [36] But sometimes if these heavy machines get damaged either the person who is operating it may either get heavy injury due to short circuit or the machine might fall on the person and the person might get killed or a mass number of people can get killed due to this. [37] The machines may cost high, requires high maintenance, consumes a lot of energy due to which the natural energy resources like coal are getting depleted at a faster rate. [38] This may cut the labour cost and the expenses which should be satisfied by the company (like health expenses and so on). [39] Machines do not demand hike in money or do not protest for any reason. [40] Machines have improved the hygiene in food industries where machines do the packing, assembling, picking of raw items and human hand need not touch the food items and to check the quality and amount of chemicals added and if the food is harmful or not. [41] The machines in various industries have helped in picking and checking of quality of raw materials, cleaning them which humans cannot do creating them into different items in a short period of time than humans who take a long time and work will also not be hundred percent efficient. [42] Machines have also been developed to check the quality of the product.

AI in Security and Services

[43]AI has shaped the security services to increase the security of the people around with new technology. [44] Security surveillance cameras have been installed almost everywhere which captures images and videos and stores it in the computer systems for a long time. [45] Different types of cameras are available which can be fitted anywhere to see the criminal activities. [46] Fingerprint and face recognition systems have been equipped in the phones, watches, computer systems for their unique identification (as all humans have different thumb impression and iris). [47] Passwords, pin, and pattern have equipped in the phones (though less safe than face and fingerprint recognition) to keep our phones, computer systems, bankdetails, social platform details

and extra safe and others do not access the information. [48] Computer systems have antivirus softwares which help in protecting against the virus, hackers, stalkers, malicious software who plan to damage our files, steal confidential details and so on from our systems. [49] Many softwares have been developed to track our phones, for women safety, theft safetyand OTP if we want to login into some websites which contain confidentialinformation. [50] Biometric and personal information of theircitizens have been recorded in the systems by the government of many countries as paper records can get erased and cannot be referred easily and check on illegal migration or any terrorist entry. [51] Drones have been employed to check illegal occupation or entry. [52]AI equipped bombing machines like bomb dropper, targeting the enemy and so on. [53] The future of security depends on AI. [54] A terrorist or a wrongdoer might try to hack our information to steal money and our credential information or steal national security and military information to attack our country so it depends on us on how we store our information carefully and instal antivirus softwares and to stop sharing our personal information to others .

AI in Education

[55] AI has a great importance in the field of education. [56] It helps in visualisation and gives live experience of concepts through animation and many tools which cannot be experienced when drawn on black board. [57] Helps in distance learning programs for people who cannot attend live classes.[58] Forexample,Vedantu, Byjus, Udemy and so on which give coaching to students so that they can sit at home, andthis saves time that takes for travelling or can attend during theirfree time. [59]AI has also helped in performing calculations, giving correct and quick values for some laboratory experiments which are difficult for humans to calculate and has saved a lot of time. [60] Many machines have been installed in schools to teach students computer programming and get hands on fresh experience before practically applying it. [61] Classes through AI can increase laziness and lacks liveliness.[62] AI has played a major role during the covid times to connect the student and teachers and continue their classes even though they couldn't physically. [63] Students will free to cheat as there is no one administer them physically. [64] Students need physical experience of handing things and would suffer if they get to do inphysically as physical knowledge is needed than AI knowledge. [65] In near future AI will replace the traditional notebook system with digital notebooks.

Advantages of AI

[66] AI is used in various fields for problem solving and decision making with speed and efficiency.[67] Doesn't perform human biological functions so can efficiently work without break and doesn't deteriorate due to health issues. [68] Can be used in places where humans cannot reach because their working conditions doesn't get disturbed by climatic changes and do not need any food or other living essentials to survive. [69] Is widely used in internet search engines. [70] Can perform tasks which cannot be done by humans for example NASA had launched a car size AI machine from Cape Canaveral on mars in the year 2011. [71] AI has played a major role during the covid 19 for checking the availability of bed, vaccine, information on number of people infected by covid near our area or in our country and getting information whether we have been infected by the virus or not. [72] It has helped the students and teachers across the world to conduct and attend classes through AI (for example google meet and so on) when face to face classes weren't happening. [73] In offline classes also students are able to visualize and understand a concept

through animation which cannot be explained by drawing on the black board. [74] Many software applications have been developed to perform lab activities instead of going to lab physically. [75] AI has also helped in the field of health and medicine where AI inputted machines are performing operations and helps in creating image and video during laparoscopic operations and create images and analysing a report during scans and MRI's.[]Doesn't perform any human errors or does minimal errors. [76] Many homes these days are equipped with AI machines that automatically performs the household chores like switching on the lights and so on with minimal usage of energy. [77] Many people have watches that calculate their daily workout routine, set alarms, can detect calls and messages, that is having all the information in their fingertips instead of taking their phones or laptops and checking information. [78] AI is used in food manufacturing industries to check the quality of food and prepare food without human contact with safety measures. [79] AI is used in automation industries to load and unload heavy items ,check the quality and ensures human safety as back in olden days many people had been injured or lost their lives by performing tasks with heavy items. [80] AI is used in war field to detect the safety measures during war, identify illegal entry of people from foreign countries, occupying the country's area by the enemy, in attacking the enemy during the war.[81]AI is used in security systems where images and videos are being captured by CCTV cameras and displaying in the computer screen and the cameras are available in many forms so that can be hidden anywhere and capture images and videos. [82] AI is used in wildlife areas to check on poaching of animals and capture their day to day activities and showcase them to the normal people for them to understand the necessities and living conditions of wildlife animals. [83] AI has helped in connecting people from far through video calls and social media sites.[84]The owners of manufacturing industries need not invest much money on labourers for their medical expenses and satisfying their needs like building schools and collages for their children, hospitals, houses and so on. [85] Little amount of electricity, maintenance for a regular period and one time investment is enough. [86] Machines cannot be bribed to do criminal activities against the owner. [87] Nowadays people can call an auto or taxi sitting at home (for example Uber, Ola) and transfer money to the driver. [88] We can transfer money online or scan and pay or pay through credit card instead of giving cash or travelling to give the money which is a risky task as money may be stolen or something dangerous may happen to the owner. [89] AI driven vehicles using electricity or solar light is under research to reduce the greenhouseeffect. [90] Maps on phones have made people lives easier as they can easily drive to the place they do not know and do not get lost most of the times. [91] It has helped students in seeing their results of their exams sitting in the home instead of going to the respective centre and checkingthe result.

Disadvantages of AI

[92] Fears have been there that AI can replace humans in all fields and unemployment will increase. [93] Many people who haven't been provided with good education depend in these jobs like working as a maid, getting labour jobs in factories and so on. [94] For example people get job as maid in the household but the owners stop them because they have machines to do the work more efficiently at a cheaper cost due to which the maids family might be starving. [95] Many people have lost jobs in the manufacturing sector as machines do their work efficiently and without any tiredness and cuts the labour cost for the owner. [96] Even people with good education are also on verge of losing job as AI can replace them also. [97] During medical operations what if the machine suddenly stop working at first it puts the patient's life at risk and this brings a disgrace and legal

issues to both the doctor and hospital. [98] In automation industries the whole manufacturing will stop if machines stop working and this create loss to the owner and if machines are not maintained properly the system may collapse and lead to many losses of life. [99] Lazinesswillstart increasing among humans as they have the thought that machines are there to perform the operations. [100] If machines stop working, this increases the workload [101] Makes decision based on facts inputted and doesn't think differently or logically. [102] If controlled by wrong people can create a huge destruction for humans. [103] AI can display our personal details to some hacker or a wrong person if not secured properly. [104] Using our personal information many people can steal money or valuable information, use this information to take many advantages from us or cyber bully or stalk our activities. [105] This may lead to suicides especially in teenagers which are increasing day by day and brings disgrace to people among society. [106] Many people develop inferiority complex about their looks and either start changing them or start to hate themselves for their looks. [107] The rudeness among children will increase and many surveys show that many teenagers consider themselves cool if they cyber bully others. [108] Children these days are not going out to play but are sitting at home and are getting addicted to harmful mobile games and do not get a chance to mingle with different kinds of people and learn new information. [109] The connect with the family and friends as been lost as the household members are always on their electronic gadgets and are less worried about their surrounds due to which many people are not able to open up with their parents and teenagers are indulging into wrong activities like gets addicted to phones instead of concentrating on studies and may other practices like drugs or get into depression and do something harmful and by the time their parents or relatives find out about this it would be too late to rectify their mistakes. [110]Machines can get damaged easily due to the prevailing climatic conditions like machine parts can get ruptured due to oxidation and forming layer by the metal. [111] Requires high maintenance and once bought need high energy supply especially in the manufacturing industries due to which lots of current are used and many machines needs to bereplaced after a short period of time and needs constant servicing of products. [112] Due to increase in machines the elements like coal (used to supply energy), iron, magnesium, silicon (these metals are used in manufacturing the machines) and so on are getting depleted at a faster rate.[113] The extensive use of machines have led to different kinds of pollution like sound pollution which results in loss of hearing, air pollution(affects our breathing) and recently Delhi has been suffering a lot due to air pollution as people are not able to come out due to smog which blocks their visibility, water pollution(chemicals in water),many animals have died and are on the verge of extinction(example in the water of Ganges the Gangetic dolphins are in the verge of extinction)and so on as machines do not think about the wellbeing of the people and are and to do the job as programmed. [114] Before also pollution used to be there but not to this extent. [115] Many people are locked into AI which are leading to health issues like eye irritation, obesity and so on . [116] It lacks the experience and knowledge which we gain through offline mode as even to make machines we physical experience.

Conclusion

[117] In my opinion AI is going to make our work easier and apparently safer and is going to decide and shape our near future. [118] There is no doubt in that but it depends on how safe we use it. [119] We should be thoughtful and not share our personal information to others(like colleagues, friends or people who spam us by contacting us). [120] AI should be used in such a way that it doesn't take away their jobs from many people. [121] Unemployment is bound to happen but we

should take steps to reduce it or replace their job in some other firm where they know how to work. [122] AI is going to be our masters(without them we won't be able to do anything) but it should be controlled by wrong people then it would create a huge destruction to the mankind. [123] In near future AI would be driving us to the places controlling our finances and our personal details and if we want rental cars or maybe even helicopters would come to our place to pick us up. [124] AI has created hygiene and safety for labourers and also to people who use it. [125] It has also created many data scientists and practically worlds three-fourth population knows how to handle a computer or phone and how to use it. [126] It all depends on how efficiently we use it to make our world better a better place for all.

References

Barbezat, G., & Wuest, G. (1998). Advantages for automotive industry of plasma spray coating of Ai–Si cast alloy cylinder bores. *Surface engineering*, *14*(2), 113-116.

Beck, J., Stern, M., & Haugsjaa, E. (1996). Applications of AI in Education. *XRDS: Crossroads, The ACM Magazine for Students*, *3*(1), 11-15.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Bullers, W. I., Nof, S. Y., & Whinston, A. B. (1980). Artificial intelligence in manufacturing planning and control. *AIIE transactions*, *12*(4), 351-363.

Chen, H., & Wang, F. Y. (2005). Guest editors' introduction: Artificial intelligence for homeland security. *IEEE intelligent systems*, *20*(5), 12-16.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Das, S. K., Adhikary, G. N., Islam, M. N., Paul, B. K., & Das, G. G. (2004). Artificial insemination (AI) by raw semen: Its advantages and disadvantages in Deshi chicken (Gallus domesticus). *International Journal of Poultry Science*, *3*(10), 662-663.

Davenport, T., & Kalakota, R. (2019). The potential for artificial intelligence in healthcare. *Future healthcare journal*, *6*(2), 94.

Filippetti, F., Franceschini, G., Tassoni, C., & Vas, P. (2000). Recent developments of induction motor drives fault diagnosis using AI techniques. *IEEE transactions on industrial electronics*, *47*(5), 994-1004.

Haenlein, M., & Kaplan, A. (2019). A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. *California management review*, *61*(4), 5-14.

Idris, N. B., & Shanmugam, B. (2005, December). Artificial intelligence techniques applied to intrusion detection. In *2005 Annual IEEE India Conference-Indicon* (pp. 52-55). IEEE.

Jiang, F., Jiang, Y., Zhi, H., Dong, Y., Li, H., Ma, S., ... & Wang, Y. (2017). Artificial intelligence in healthcare: past, present and future. *Stroke and vascular neurology*, *2*(4).

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Lee, J., Davari, H., Singh, J., & Pandhare, V. (2018). Industrial Artificial Intelligence for industry 4.0-based manufacturing systems. *Manufacturing letters*, *18*, 20-23.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education.

McCarthy, J. (1998). What is artificial intelligence?

Medvedev, S. P., Shevchenko, A. I., & Zakian, S. M. (2010). Induced pluripotent stem cells: problems and advantages when applying them in regenerative medicine. *Acta Naturae (англоязычная версия)*, *2*(2 (5)).

Newell, A. (1982). *Intellectual issues in the history of artificial intelligence*. CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF COMPUTER SCIENCE.

Nilsson, N. J. (2009). *The quest for artificial intelligence*. Cambridge University Press.

Osipov, S. S., & Ulimova, N. V. (2013). ADVANTAGES AND DISADVANTAGES OF AI. *SCIENCE AND WORLD*, 77.

Pollack, I. P., Quigley, H. A., & Harbin, T. S. (1976). The Ocusert pilocarpine system: advantages and disadvantages. *Southern medical journal*, *69*(10), 1296-1298.

Russell, S., & Norvig, P. (2002). Artificial intelligence: a modern approach.

Waisi, M. (2020). Advantages and disadvantages of aI-based trading and investing versus traditional methods.

Weibelzahl, S., & Weber, G. (2002). Advantages, opportunities and limits of empirical evaluations: Evaluating adaptive systems. *KI*, *16*(3), 17-20.

Woolf, B. (1991). *AI in Education*. University of Massachusetts at Amherst, Department of Computer and Information Science.

Yampolskiy, R. V., & Spellchecker, M. S. (2016). Artificial intelligence safety and cybersecurity: A timeline of AI failures. *arXiv preprint arXiv:1610.07997*.

Yu, K. H., Beam, A. L., & Kohane, I. S. (2018). Artificial intelligence in healthcare. *Nature biomedical engineering*, *2*(10), 719-731.

MORDEN UNIVERSE OF ARTIFICIAL INTELLIGENCE

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Origin of AI

[1] The Turing test is a test of a machine's ability to exhibit intelligent behaviour. The test was introduced by ALAN TURING in his 1950 paper Computing Machinery and Intelligence. The original question behind this test was "Can machines think? ".

What is Artificial Intelligence?

[2] It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable.

AI researchers are trying to create a computer which thinks.

[3] Artificial intelligence (AI) is defined as intelligence exhibited by an artificial entity to solve complex problems and such a system is generally assumed to be a computer or machine.

Artificial Intelligence is an integration of computer science and physiology Intelligence in simple language is the computational part of the ability to achieve goals in the world.

History of AI

[3] The actual history is rather messy, but it tends to work out as follows. In the 1950s, a visionary mathematician named Norbert Wiener was testing a version of the Turing machine with a chess program.

The history of artificial intelligence is quite messy, but its idea was started by Alan Turing. He thought "that what if computers could think and could figure out next step in a problem?".

His theory was that if a human can't differentiate if he/she is talking to a human or a computer. That test is called Turing's test. A software is called intelligent agent if it passes the test.

AI was born when John McCarthy termed it in 1956.

[4] During World War 2 Alan Turing helped in breaking German Enigma machine by worked at Bletchley Park.

Newell and Simon invented the idea of solving logical problems through programming codes in 1957, who they named as GPS.

John McCarthy invented a programming Language called LISP in 1958.

In most recent decade AI is advanced in:- machine learning, artificial life, planning, computer version, playing games,

Growth of AI

[5] There are mainly two themes in growth of AI.

Firstly, from the invention of spinning jenny to steam engine to electricity and then to computer chips. The key feature of economic growth is the process in development of machine production.

Secondly, the advancement in AI may be controlled by Baumol's "cost disease". He observed that the growth of AI was happening rapidly and even today, the shares of GDP decline while those sectors with relatively slow production.

[6] The important task in today's time is to make a sustainable reproduction of the capitalist economy. But in today's time of Great Recession the economy is always fundamentally instability. [7] The combination of state planning and a free market is the only way out of this deadlock. Due to lack of computer capabilities the planning was impossible to organize. But in today's world with sharp computer performance it is possible.

AI in Healthcare Appliances

[8] There are two subtypes in AI in medicine :- Virtual and Physical

The virtual part covers all the digital works such as electronic health record system, managing medical records.

The physical part covers with assisting robots in surgeries, elderly care and intelligent prostheses for handicapped people.

[9] Doing computative task such as X-Rays, CT scans, Analysing Test and data entry can be done by robots more accurately and faster. Cardiology and Radiology are two fields where the amount of data to examine is too much and very much intense. In future, only in complicated cases only human supervision is required in these two fields.

In recent progress of AI in medicine it helps in following procedures:-

- Cardiology -Atrial Fibrillation
                 -Cardiovascular Risk
- 2) Pulmonary Medicine
- 3) Endocrinology
- 4) Nephrology
- 5) Gastroenterology
- 6) Neurology -Epilepsy
    -Tremor Assessment

Conclusion

[10] All the progress of AI happened is great but it will not replace the doctors in anytime soon.

AI in Manufacturing

[11] AI is a universal technology which is present in all sectors including manufacturing and production.

In this new era in advancement of AI intelligent manufacturing is done by the companies. In this intelligent manufacturing all production, management, integration, testing, system engineering technology and product related technology is integrated with the whole system.

The optimization of different aspect of manufacturing includes 3 element and 5 flows are all programmed by AI for best cost-efficiency, high quality and userfriendly equipment.

Elements:- organization, management and equipment and technology

Flows:- information, logistics, capital, knowledge and service

[12] There are many advantages of AI in Manufacturing

1. Quality inspection:- AI can easily do many inspection task in less time, high efficiency and more accurately from a human.

2. Advanced robotics:- to use AI in manufacturing it must be hand-build to perform a specific task but once after making 1 robot we can mass produce it then that task can be done in less time with almost zero effort.

3. Transportation:- In today's world automatic driving cars are already been made so it can help a manufacturer to reduce labour cost and it will reduce the chances of accidents.

AI in Security and SURVEILLANCE

1) Cyber Crime

[13]AI helps a company to be safe from online fraud by using neural network which helps in detection of spam, computer worms, malware classification. In anti-virus technology different techniques of AI is used such as Data mining and AISs

2) Troll bot detection and blocking

[14] In a research paper it is estimated that there are around 9%-15% of accounts on twitter are bots which are increasing from time to time. Botmeter API is a machine learning models which offers an AI driven approach which can detect that a account is a bots or a person. If it finds a bot account then it will automatically remove it from the platform.

AI in Education

[15] Mainly the work of AI is heavily associated with computer but as we read more and more articles, particularly in sector of education it is defined in two parts. The two parts are a field and a theory. In the field of study, AI is defined as the study area of computer science which focus on solving different cognitive problem. In the field of theory, AI solves theoretical framework with the guidance of CS and the help of humans.

In the new era machine learning and AI are widely applied in smart phones, whose target is to improve the quality of computers and open new possibilities for the new generation such as face recognition, speech learning, language translation and VR.

Let's talk about virtual reality (VR), it connects every student around the world with the help of AI, beyond the learning space. It also helps in online learning as it, turn instructor' s speech into text know as transcription.

Due to the advancement in AI burden on instructor is becoming less as AI can revaluate papers, assignments, essay and also take attendance of how many students are present in class and how many of that are actually paying attention. Due to AI the instructors can focus on more important things such as student performance. AI can better analysis student data which would help the instructors to how to help each student in different ways and also with the help of AI the system can prevent the students from cheating and doing plagiarism in their homework, test and exams.

Advantages

[16]1) Due to AI a student can learn anything, anywhere and at on any time on this planet.

2)A person can find hundred of this online but because of AI that person can also find and learn topics related to that product he/she initially searched for.

Disadvantages

[17]1) Due to weather there may be network issue

2)Students can easily find their homework answer on the web

3)Rural areas does not have net connections.

Advantages of AI

[18]AI helps in almost every aspect of the work as it is cost effective, reliability and permanency. It is problem solving speed is also good. It can be used in many diverse field such as manufacturing, medicine, education, engineering and also be used in decision making. As its one of the most useful application is search engines. AI also prevents from knowledge from being lost. It can also develop learning capability that is learning from real world failure and success which is know as "reinforcement learning" which would give people advantage on what to when a situation is presented in front of them.

Now days AI is also used in transportation system, and many specific research have been provided that it is useful in transportation. Currently AI is being used in predicting traffic condition, reporting traffic accidents, it also used in traffic lights and sensor. AI can also be used in security breaches, and also in management and development of automatic response and control panels.

[19] Its major advantage is that it works on a program code rather than emotion so almost every time it gives prefect and precise answer to every question every asked. Due to AI spreading of information is so much easier and it give an answer to a question whenever we want to.

[20]AI helps a company to be safe from online fraud by using neural network which helps in detection of spam, computer worms, malware classification. In anti-virus technology different techniques of AI is used such as Data mining and AISs

[21] It also in medical field by doing computative task such as X-Rays, CT scans, Analysing Test and data entry can be done by robots more accurately and faster. Cardiology and Radiology are two fields where the amount of data to examine is too much and very much intense. In future, only in complicated cases only human supervision would be required.

[22] Its overall advantages are work done in a short amount of time, it has more efficiency, can do various function at the same time and its success ratio is high

[17] Some more uses of AI :-

- It can do difficult work in short amount of time
- It can do various task at the same time
- It requires less space
- It can discover unexplored things, i.e. outer space

Disadvantages of AI

[18] However AI also has some disadvantages as it is such a broad network an Sd everyone has access to most of the things. As it was also mentioned by Van Zuylen in his article that he mentioned AI as a black box and it's merely an attempt between input and output to establish a relationship. AI has advanced in automation but nevertheless it is no exception, with pace we are going now in future all vehicles will be automatic and if an automatic vehicle is involved in a accident then who would be held responsible for that crash?

[19] For most of the time it can't explain the logic and reasoning used to make a decision. If it does some malfunction due to a virus or anything else we would not notice it until some major blowback hap pens. It can be used for fraud and cybercrime.

[22] Because of AI many things are affected some in good way but some in bad way such as due to AI human jobs are affected, person dependency on technology is increased, as the generation moves on it has answer on their fingertipes and they become lazy.AI is a genetic algorithm, ant colony optimization and they never guaranty to reach the optimal solution. It also has the inability to do quickly sensitivity analysis and it's hard to find different methods for same problem in calculus.

[17] To increase the development of AI it needs tons of resources as many of the equipment are expensive. It cannot create bond with other machines as humans so it has poor team management. It can only do task which they are designed to do if there is slite change in task we have to code it again.

Conclusion

After reading many reports and research about artificial intelligence, in my opinion it's for sure that AI will be the future of upcoming generation. Now day AI is present in most of the upcoming and advance fields. AI is able to some pretty extraordinary things now days only so in future AI would be able to almost anything with little bit to human supervision. It's not that far away from now that AI will be able to make new and better version of themselves, so if we continue at this pace there will be only two outcome as I see. 1) AI will advance in a limited rate and it will help humanity in a good way 2) If AI advance at a much faster at first it will help humanity but as the time passes out AI will develop it's brain in such a manner that it will think about itself first which might not be good for humanity.

References

Aghion, P., Jones, B. F., & Jones, C. I. (2019). 9. Artificial Intelligence and Economic Growth (pp. 237-290). University of Chicago Press.

AI in Healthcare by academia.edu

Amisha, P. M., Pathania, M., & Rathaur, V. K. (2019). Overview of artificial intelligence in medicine. Journal of family medicine and primary care, 8(7), 2328

Arkorful, V., & Abaidoo, N. (2015). The role of e-learning, advantages and disadvantages of its adoption in higher education. International Journal of Instructional Technology and Distance Learning, 12(1), 29-42.

Benko, A., & Lányi, C. S. (2009). History of artificial intelligence. In Encyclopedia of Information Science and Technology, Second Edition (pp. 1759-1762). IGI Global.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. Aayushi International Interdisciplinary Research Journal, 227-230.

Briganti, G., & Le Moine, O. (2020). Artificial intelligence in medicine: today and tomorrow. Frontiers in medicine, 7, 27.

By Michael C. Horowitz, Gregory C. Allen, Edoardo Saravalle, Anthony Cho, Kara Frederick, and Paul Scharre

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. Ieee Access, 8, 75264-75278.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Coppin, B. (2004). Artificial intelligence illuminated. Jones & Bartlett Learning.

Crandall, D. J. (2019). Artificial intelligence and manufacturing. Smart Factories: Issues of Information Governance, 10-16.

Economic Report of the President 2012. P. 373, 376.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. International Journal of Library & Information Science (IJLIS), 9(1), 3.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. Frontiers of Information Technology & Electronic Engineering, 18(1), 86-96.

McCarthy, J. (2007). What is artificial intelligence?.

Russell, S., & Norvig, P. (2002). Artificial intelligence: a modern approach.

Siddiqui, M. Z., Yadav, S., & Husain, M. S. (2018). Application of artificial intelligence in fighting against cyber crimes: A REVIEW. International Journal of Advanced Research in Computer Science, 9(2).

Statistical Abstract of the United States 2004-2005, p. 853.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

ARTIFICIAL INTELLIGENCE

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What is Artificial Intelligence

[1] Artificial intelligence is the field of science and technology to produce machines , specifically programs of a computer. It is basically a methodology to use the computers to acknowledge human intelligence, Without itself resembling any biological characteristics of human beings. [2] Artificial intelligence is regarded as the ability of a system to take up external data and interpret precisely, form a basic component of leaning from that data and to utilize those learnings to gear up to particular goals and chores via flexible adaptation. It is a technology which makes the life of people easier by increasing the rate of work with or without few disadvantages. It includes computer programming to classic codes which enables smooth functioning of machines which we use in day to day life. AI can offer a work which cannot be generated manually at any cost and therefore AI plays an important role in analysing and representing data in a precise manner.

History and Growth of Artificial Intelligence

[3] Artificial intelligence has a beginning which can be traced back to the initial era of philosophy and imagination. Inventions during initial days was based on engineering aspects like electronics and few others which has influenced AI to a large extent.AI can be traced back to many years which originated with simple techniques and technologies. Some instances include working in problems which involves basic learning, representation of knowledge and problem solving demonstration in languages and many more [4] The official language of AI was described by George Boole in 1847.Following it was the history created in 1936 during when Alan M discussed about the Turning-machine .The artificial neurons was created by Warren McCulloch in 1936.

Growth of Artificial Intelligence

[5] AI may be used for the ordinary production of goods and specialized services which impacts the economic growth of the country drastically. It can also be used to modify the ideas for the creation of varied technologies which later helps to overcome complicated problems [6] Artificial intelligence was implemented everywhere from the emerging company to a well-built company .It reduces the time taken to complete the task by decreasing the workload on the labourers which in turn increases the productivity within the stipulated time.AI has shown a significant growth in economy where the productivity is sometimes directly based on its performance. With these kind of significant growth in AI as technology the number of users depending on it is increasing day by day.

Artificial Intelligence in Healthcare Appliances

[7]AI reduces the workload on doctors and it helps them to diagnose without themselves being at the state of confusion. In spite of this advantage it also helps them to overcome mental stress and to do the medical procedure more efficiently which leads to accurate decisions taken by the staffs and nurses. A significant growth of AI is seen in the last few years.[8]Mobiles are used to detect certain medical terminologies In the modern world where the device can be used to specify certain

abnormal conditions. AI has also helped to increase the rate of production of medicines. In case of any emergency in medical aspects AI plays a huge role in compensating the time which is lost. By this the doctorsget sufficient time to concentrate on the tasks . For example if the blood pressure of a person needs to be in a specific level and needs to be monitored then there can be a machine which uses the technology of artificial intelligence instead of person monitoring. With such technologies like this it enhances the performances of surgical activity as it gives more time and precision for doctors to perform that specific tasks. [9] AI has seen a significant growth in detecting certain diseased which would take longer to detect manually and thereby saving lots of life in today's era.AI is seen as an emerging subject of science in medicinal field. Some of the complex characteristics of human skin can be detected by using the e-skin which is based on tactile sensor. Pressure used for certain surgical purpose can be detected using robots via computer programming. High accuracy tasks can be performed using robots where humans fail to do so. In case of the production of medicinal drugs AI has helped a lot as it can increase the rate of production. Biotechnology , a field of biology which is in high demand dude to the high demand of medicinal drugs, is seeing an enormous growth. The advancement of microscope to look at the specimen more precisely helps to overcome some vulnerable situations. One can say that the medicinal field in today's era is as it is because of the technology involved in it as these technologies are indirectly related in saving a huge number of lives of people. Therefore Artificial intelligence as a field of science is mainly emphasised in bringing gain to all sectors of science especially in medical field by giving it what it can offer at its best.

Artificial Intelligence in Manufacturing and Production
[10] Artificial has deliberately contributed to the increase in the quality of the products which in turn reduced the cost of manufacturing goods through man power. It also adds up to the fact that it is user friendly. Competition among the manufacturers has increased over the past few years. [11] AI is used in controlling the cost of a particular work as it reduces the labour hours and therefore it is environment friendly. [12] AI is seen contributing positively to the revolution of certain industries which includes manufacturing and production as their main preference. Due to the increase in the accessibility of AI certain products like smart watches, sensors have increased their efficiency and need to people in the recent time.AI has made humans to evaluate the products more efficiently in a faster rate. With the demand for the goods is increasing day by day than the supply of the product due to the high population these days , AI is playing a major role in upstanding with this task. Moreover it has also increased the rate at which a goods are manufactured. A bottle made manually can be good enough but it consumes a lot of time to make thousand such bottles . At the same time a machine can manufacture 1000 such bottles less than a time taken to make one bottle manually. By analysing this situation we can see how Artificial intelligence has made our life easier by making it possible for the supply to meet the demands of human beings.

Artificial Intelligence in Security and Surveillance
[13] Artificial intelligence has been used by majority of the countries nowadays in military and defence. They are using robots especially as a guard whose functions would be similar to be autonomous.[14] AI has been used enormously in military when it comes to viewing an enemy on the target level strategically which can be referred to as the tactical battlefield. [15] AI plays a significant role in maintaining security. Many advanced features are emerging these days in the IT

field such as cyber security where varied unusual practices can be identified. It can be used to seek alerts whenever there is a cyber attack or a hack.These days there are many cyber attacks which leads to the loss of huge amount of money. Nowadays many privacy alerts are seen which is a great threat to the security of the country or an individual. In order to combat such situations being intense AI can be useful in most of the cases. It has also shared its contribution in helping to set alarm alerts in case of any instability in the performance of the stipulated objects therefore disabling the risk threats. Many transactions which needs more security is being processed AI stimulated machines which ensures that there is no disagreement between the depositor and a receiver. When a belonging of a person gets lost, such as mobile phones and such devices , it can easily be tracked to get it back. Nowadays OTP is played a major role in decreasing the number of chances the details can be hacked by providing one time password which only the owner of that details can access. By this we can easily analyse the importance of Artificial intelligence in the field of security as many such investigations cannot be done manually. AI gives us what a manual work fails to give us in terms of security.

Artificial Intelligence in Education (AIED)

[16] The application of AI in education is equipped with the development of AI in technologies for the purpose of study in case of human teaching and for the learning which facilitates systems of engineering. Some of the method which involves conceptual studies utilizes AI for learning outcomes such as control, planning, acquisition and knowledge representation.[17] Since 20 years, computers are being used in education. The first teaching attempt using system was through Computer-based training (CBT) and computer aided instruction(CAI). The needs of the learner was not individualized by these kind of systems.AI can also be used to generate certain conditions where a physically challenged students can find it easy to learn something new. There are many tools which enables those kind of students to cope up with learning.[18]During the conduction of exam and evaluation of the answer scripts of the students AI plays a major role in detecting the accurate and false answers and therefore reducing the work load of teachers in most of the cases .This can also be applied to check the accuracy of the performances in interview , mocktests , working precision ETC. Many instances taken from journals which includes instructional and dialogue systems, exploratory learning supported through AI ,student writing analysis, environments which are based on games chatbots supported by students which enables to control their learning firmly on their own.AI can be used to deliver a lecture more practically to the students which enables them to understand the concepts with more clarity and efficiency. Some of the complex concepts which involves high virtual thinking cannot be thought manually and therefore in such cases AI plays a significant role. AI can also be used to generate applications in case an user wants to apply abroad for any education specific reason. This would definitely increase the rate at which the work is done by the student instead of them wasting time by waiting long hours for small tasks. In this way it gives more time to students to concentrate on academics instead of worrying about tasks which are indirectly related to education. With all these facilities of AI, a student tends to learn a subject with more understanding and clarity of the concepts. Many organizations have been formed which uses these techniques in the field of teaching . And in many cases students learning from these techniques have topped the list. In this way AI has helped to achieve a significant growth in the quality of deliverance in the field of education sector.

Advantages of Artificial Intelligence

[19].Artificial intelligence (AI) applications are utilized to simulate human intelligence for either solving a problem or making a decision. AI provides the advantages of permanency, reliability, and cost-effectiveness while also addressing uncertainty and speed in either solving a problem or reaching a decision.AI has been applied in such diverse realms as engineering, economics, linguistics, law, manufacturing and medicine, and for a variety of modelling, prediction, and decision support and control applications.Artificial Intelligence is used to increase the productivity of goods and manufacturing items which enables the industry to gain the profit. [20]. One of the major advantages of artificial intelligence is that its decisions are based on facts rather than emotions.Even after our utmost efforts, it is a well known fact that human decisions are always affected in a negative way by our emotions. Unlike humans, machines with artificial intelligence do not need any sleep, thus overcoming the inherent disadvantage of tiredness in humans.Easier spreading of knowledge. Once an artificial mind is trained for something, it can be very easily copied to the others reducing the time wasted in otherwise passing on knowledge to other humans through training. Moreover it enables the system to work more efficiently rather than getting tired unlike human beings .This decreases the time needed to perform certain tasks with more efficiency and less stress [21]. In the present era systems provide perfect utilization by the fellow beings by implementing experimentation and initiating application of artificial intelligence .It has tasks which are perceptual. In many cases these technologies stimulate human brain which can be used for specific reasons.It has also emerged significantly in the field of gaming and giving theorems to involve users in activities more than perceptual tasks. In this way we can view AI technology emerging as a field to do tasks quicker and easier.It can also be noted that modern technologies which involves AI makes the banking life easy. [22]. AI involves in developing many field of technologies including chatbots, self learning algorithms, transition of machines which enables users to understand their environment in a batter manner and to act accordingly.. Many organizations are seen adopting AI technologies to compete with the fast growing technologies.AI has seen expressing the way to the automation improvement, effects of transformation and information effects but also to involve interaction with humans with certain detections and predictions. [23] In case of detection and diagnosing certain particular faults in energy systems of building .AI has emerged enormously with powerful capacity. This reveals some of the intelligence-based methods which can be implemented in future. Considering the subject of doing task more easily, artificial intelligence. A I can be used to monitor certain aspects to prevent malpractices during certain examinations where the user is restricted from using external devices to search the answers and indulge themselves in such activities. In this way AI ensures a fair activity for everyone. AI can also be used to increase the speed of transactions as in today's world most of the transactions are done through net-banking

Disadvantages of Artificial Intelligence

[24] Lack of creativity in responses, Inability to explain the logic and reasoning behind a certain decision, Current development is at a stage where the AI cannot know when there is no solution to a particular problem, Any malfunctioning can lead to the AI producing wrong solutions and since it cannot explain the reasoning behind its answer, blind reliance on AI can lead to problems, Lack of common sense in reasoning can also cause major problems •It can be used to cause mass scale destruction if given in the wrong hands.[25]Disadvantages of Artificial Intelligence (AI) Some of the main disadvantages of Artificial Intelligence (AI) in our daily lives are as follows. It should be

noted that all the data stored in the technology of AI is through manual and therefore if there is a slight error then it can cause a huge loss to the company as AI software need to be updated about the concept of data regularly. Some time it can be misused leading to mass scale destruction ,Program mismatch sometime done opposite to the command,human jobs are affected, Unemployment problem increased,Creativity is depend upon programmer, Lacks the human touch,Younger generation becomes lazy, Require a lot of time and money, and, Technological dependency increased [11] It is also observed that due to the high dependency on AI , many youngsters are prone to investing huge amount on certain apps expecting a huge return of investment . And on one fine day if the return didn't meet their expectations then they are often prone to depression. TheAI which is developed recently has seen a negative impact where over depended on ICT models has been seen in the field of big data, self-idea function which is lacking and such impacts are complicated. [12] Bio scientists still face difficulties in understanding the functionality of human brain but all they can say is that the human brain is capable of functioning more precisely in terms of chemical and physical aspects than a chip of a CPU .But as the new technologies are included without solving the mystery of the brain professor Steen considers that AI is stupid. [26] As the machines arehighly expensive it is difficult to develop and equip them.Can lead to the investment of lots of cash and time to manufacture , repair and rebuild.AI can sometime mislead youngsters in the context of usage of machines.Itcan make users less intelligent as users depend on computer systems to do all the work.Moreover it is power consuming which is not a great sign. Some times using Robots can lead to a disaster. For examplewhen the robot is created to help humans do their tasks more precisely, sometimes it can be over used to gain more technology and it will perform the task which is not under the control of humans, In this way resources are lost and it basically damages the existing environment unnecessarily. This can often lead to huge financial loss of the company. Even though AI makes the data precisely ,sometimes people need one to one to solve certain problems instead of believing an algorithm . Therefore it is necessary to understand the limitations if usage of AI and we need to restrict ourselves from using it in the exceeding amount of time . One must try to develop the balance between using technology and growing up their own knowledge instead of blindly trusting AI in all aspects because and modification in the world will not update the technology automatically . Most of the cyber alerts are due to the dependency on AI instead of manual security forces . These circumstances enables us to understand the limitations of AI and its usage.At the end it can be more harmful to children of today's generation as the are more prone to be dependent on AI for even a small work as they are heavily exposed towards it. Youngsters involving themselves negatively in the field of AI has been observed in recent reports and it's a serious matter of concern whose issue needs to be raised in order to keep a huge population of youngsters on track. In this way one must understand the limitations of usage of Artificial intelligence.

Conclusion
Artificial intelligence shares the positive impact in today's world by pointing out few disadvantages too. In fact most of the industries, hospitals, engineering offices ,ATC controller office , Airports ETC are utilizing AI based systems to increase their rate of functionality .Without Artificial intelligence our life would be a sort of complicated time-consuming journey .Moreover the cons it shares does not overlap the pros. All structures which we view on Television is because of AI which has emerged significantly in these years. From education to utilization AI has been the most prioritized form in today's generation. Moreover to decide whether it is pro or con ,it all depends on

the utilization by the user. Many applications which includes easing of life of human beings are developed to conserve the time for additional purpose. Some of us might find AI to be either helpful or loss but it all depends on the way one uses it. AI has played a key role in the fields such as health care appliances , security and surveillance and mainly in the field of education.Sometimes the task we wish to be performed effortlessly can backstab us by using AI, one such common example is when we create a robot to do our day to day works but that robot gains power to dominate us in the aspect of doing work and one fine day that can backstab us as a result of predominance. At last it all depends on how the user makes benefit of it, rather then concentrating on negative or positive aspects of AI . Precise use of AI can improve the rate of performing tasks and can even increase the precision. But at the same time, Over usage of AI can decrease the person's ability to think on his own and becoming less intelligent.

References

Aghion, P., Jones, B. F., & Jones, C. I. (2019). 9. Artificial Intelligence and Economic Growth (pp. 237-290). University of Chicago Press.

bdulov, R. (2020). Artificial intelligence as an important factor of sustainable and crisis-free economic growth. Procedia Computer Science, 169, 468-472.

Beck, J., Stern, M., &Haugsjaa, E. (1996). Applications of AI in Education. XRDS: Crossroads, The ACM Magazine for Students, 3(1), 11-15

Benko, A., &Lányi, C. S. (2009). History of artificial intelligence. In Encyclopedia of Information Science and Technology, Second Edition (pp. 1759-1762). IGI Global.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intelligence. Aayushi International Interdisciplinary Research Journal, 227-230.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. Ai Magazine, 26(4), 53-53.

Chen, H., & Wang, F. Y. (2005). Guest editors' introduction: Artificial intelligence for homeland security. IEEE intelligent systems, 20(5), 12-16

Chen, M., Liu, Q., Huang, S., & Dang, C. (2020). Environmental cost control system of manufacturing enterprises using artificial intelligence based on value chain of circular economy. Enterprise Information Systems, 1-20.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies

Chowdhury, M., &Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues,6(3), 360-375.

Haenlein, M., & Kaplan, A. (2019). A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. California management review, 61(4), 5-14

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education. Boston: Center for Curriculum Redesign

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., &Scharre, P. (2018). Artificial intelligence and international security. Center for a New American Security.

Johnson, J. (2019). Artificial intelligence & future warfare: implications for international security. Defense & Security Analysis, 35(2), 147-169.

Lee, L. W., Dabirian, A., McCarthy, I. P., & Kietzmann, J. (2020). Making sense of text: artificial intelligence-enabled content analysis. European Journal of Marketing

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. Frontiers of Information Technology & Electronic Engineering, 18(1), 86-96

McCarthy, J. (2007). What is artificial intelligence?

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies.Science [ETEBMS-2016],5(6). [10] Khanzode, K. C. A., &Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning:A Literature Review.International Journal of Library & Information Science (IJLIS),9(1), 3 [11] Lu, H., Li, Y., Chen, M., Kim, H., &Serikawa, S. (2018). Brain intelligence: go beyond artificial intelligence. Mobile Networks and Applications, 23(2), 368-375.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016],5(6)

Teng, X. (2019, April). Discussion about artificial intelligence's advantages and disadvantages compete with natural intelligence. In Journal of Physics: Conference Series (Vol. 1187, No. 3, p. 032083). IOP Publishing.

Wagner, J. B. (2019). Artificial intelligence in medical imaging. Radiologic technology, 90(5), 489-501.

Woolf, B. (1991). AI in Education. University of Massachusetts at Amherst, Department of Computer and Information Science

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. Materials Horizons, 2(2), 140-156.

Zhao, Y., Li, T., Zhang, X., & Zhang, C. (2019). Artificial intelligence-based fault detection and diagnosis methods for building energy systems: Advantages, challenges and the future. Renewable and Sustainable Energy Reviews, 109, 85-101.

ARTIFICIAL INTELLIGENCE AND THE HUMAN BRAIN

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What is Artificial Intelligence

[1] Artificial intelligence is the making of intelligent machines , especially intelligent computer programs through science and engineering .It is related to making computers to know human intelligence but it is not confined to the biologically observable methods. [2] The activity devoted for making intelligent machines is Artificial intelligence , as intelligence is the quality required for working properly and with environmental foresight .

History of AI

[3] The beginnings of artificial intelligence can be traced back to philosophy ,fiction and imagination. AI has been influenced by earlier electrical inventions and inventions done by engineers. Problem solving which included basic work in learning, representation of knowledge, inference and also demonstration programs in language understanding, translation, proving of theorems , memory association and knowledge-based systems. [4] 1950 was the year when artificial intelligence was first described, but its widespread and medical application was prevented by several limitations in its early models. Advent of deep learning helped in overcoming many of these limitations during the early 2000s. AI systems are now capable of analyzing complex algorithms and self-learning.

Growth of AI

[5] Deep learning algorithms and neural networks are the forms of artificial intelligence being intensely explored for novel healthcare applications in areas such as imaging and diagnoses, risk analysis, lifestyle management and monitoring, health information management, and virtual health assistance. Benefits expected in these areas are ranging wide and also include increased speed in imaging, greater insight into predictive screening, and decreased healthcare costs and inefficiency. [6] The future of health care may change dramatically due to the solutions offered by entrepreneurs that change how we prevent, diagnose, and cure health conditions, by the use of artificial intelligence (AI). This article provides a timely and critical analysis of AI-driven health care startups and also identifies business model archetypes which are emerging that entrepreneurs from around the world are using to bring AI solutions to the marketplace

AI in Healthcare Appliances

[7] Flexible pressure sensors that are based on the concept of organic materials, which combine the unique advantages of flexibility and low-cost, have emerged as a highly active field due to their promising applications in artificial intelligence systems and wearable health care devices. [8] Our everyday life has been invaded by artificial intelligence and in the last 10 years everyone has seen the emergence of artificial intelligence as a very promising application in the field of medication . In a near future the chance that AI will find tremendous applications in dento-facial deformities recognition is very high due to its amazing power in image recognition. [9] An increased life span

has resulted due to Advancements in medical science and technology. The elderly often gets cognitively impaired and require urgent medical services which when left unnoticed may lead to fatal consequences. Due to lack of social care support for these adults, there arises the need to develop cost-effective assistive healthcare technological solutions for taking care of the elders and giving them the best tech-friendly experience. Intelligent homes, an environment of sensors with artificial intelligence integrated with home appliances, can provide the best solution for continuous and remote monitoring of the health of the persons.

AI in Manufacturing and Production

[10] Intelligentization, supported by artificial intelligence (AI) technologies, has become an important trend for industrial manufacturing over the past few decades which is accelerating the development of smart manufacturing. Standard AI has been endowed with additional attributes in the modern industries, yielding industrial artificial intelligence (IAI) which has become the technical core of smart manufacturing. [11] Research based on applications of artificial intelligence (AI) technology in the manufacturing industry in recent years, we can analyze the development of core technologies in the new era of 'Internet plus AI', that has triggered a great change in the models, means, and ecosystems of the manufacturing industry, as well as in the development of AI. [12] Modern manufacturing and logistics systems are supported by ubiquitous and computing networks which are very powerful. Within these networks, oceans of data are continuously being generated by sensors, machines, systems, smart devices, and people.

AI in Security and Surveillance

[13]Information technology valuable part of making our nation safer. Critical national security missions in the context of various data and technical domain challenges could benefit from establishing an intelligence and security informatics research discipline. Just as biomedical informatics addresses information management issues in biological and medical applications, ISI would address such issues for intelligence and security applications. [14]Surveillance cameras have a plethora of usages in newly born cities including smart traffic, healthcare, monitoring, and meeting security needs. One of the most famous new cites is the Egypt's new administration capital "New Cairo". The new administration capital of Egypt mainly characterizes with the green life style via the "Green River ". [15] Human eyes are highly efficient devices for scanning through a large quantity of low-level visual sensory data and delivering selective information to one's brain for high-level semantic interpretation and gaining situational awareness. Over the last few decades, the computer vision community has endeavoured to bring about similar perceptual capabilities to artificial visual sensors. Substantial efforts have been made towards understanding static images of individual objects and the corresponding processes in the human visual system.

AI in Education

[16] AI in education is a field concerned with the development of Artificial Intelligence for the study in the department of human teaching and to engineer a system facilitating human learning. The questions of long-term nature are addressed by this field. 'Intelligent Tutoring System'(ITS) is a term frequently used regarding the engineering side of discipline. In support of AI activities such as planning,control,knowledge representation and acquisition, explanation, cognitive modelling and dialog management computational methods are used. Alternative theories about learning are

evaluated and explored using computational methods. [17] For over 20 years computers have been used in education. Systems that were first deployed as an attempt to teach using computers were computer-based training (CBT) and computer aided instruction (CAI). Instructions in these kind of systems were not individualized to the learner's need. Instead there were script like decisions for the students to move through the material such as ' if question 20 is answered correctly move to question 40 otherwise move to question 10' and thus the learner's abilities were not taken into account. Intelligent tutoring systems are highly effective in motivating students and increase their performance. [18]For more than 30 years the application of artificial intelligence to education (AIEd) has been the subject of academic research. Learning wherever it may occur, classrooms or in workplaces, is investigated by this field in order to support formal education as well as lifelong learning. In order to promote the development of adaptive learning environments and other AIEd tools that are flexible, inclusive, personalised, engaging, and effective it brings together AI, which is itself interdisciplinary, and the learning sciences (education, psychology, neuroscience, linguistics, sociology, and anthropology). The scientific goal at the heart of AIEd is to "make computationally precise and explicit forms of educational, psychological and social knowledge which are often left implicit." In addition to being the engine behind much 'smart' ed tech, AIEd is also a powerful tool to open up the 'black box of learning,' giving us deeper, and more fine-grained understandings of how learning actually happens.

Advantages of AI

[19] The advantages provided by AI is that it is durable, reliable, and cost-effective while also addressing uncertainty and speed in either solving a problem or reaching a decision. AI has been applied in many diverse realms such as engineering, economics, linguistics, law, manufacturing and medicine, and also for a variety of modeling, prediction, and decision support and control applications. AI has been rigorously used in internet such as in search engines which is one of its most promising applications. with their increased use in applications. AI has already proven to be quite reliable in many different applications and broad application of any tool only occurs when its reliability has been established, and it has the ability to simulate human intelligence in a reasoning process. AI supports cost minimization as it enables reduction on the need of personnel time like many automations. By adopting appropriate AI applications in the decision-making process, thus reducing operational costs an agency can reduce significant staff time. [20] In a literature review about using AI in trading and investing and theories of chaos and automata, an online AI-based trading platform, a TEDx presentation, and also an interview with a software engineer was presented and analysis of all these materialsdemonstrated that it take much time to collect data and make strategies by analysing it using traditional training method, which is also time-consuming. An AI trading system although expensive to develop, can explore vast data and make more and better results once built, for example, picking stocks quickly. Artificialintelligence have a huge impact on trading and investing in financial markets as indicated by the results. Although it is expensive to invest in it as an individual or small company, it is proven to be more profitable for big finance companies at the same time. [21] Artificial intelligence has incredible benefits, Itcan offer us, is to evolve definitively and move on to the history of artificial robots. The main advantages of Artificial Intelligence (AI) are it can finish task faster than humans,it can easily complete stressful and complex works, It can do a difficult work in short period of time,It can do various tasks at the same time,the success ratio is high, it shows less error in tasks,it takes up less space, it is compact in size,

it can do calculation of long term and complex situations, and also discover unexplored things. i.e. outer space. [22] Human works can be reduced by using artificial intelligence, by replacing peoples by machines and people can do others works like programming , self-writing , self modifying etc by these works man feels burden on him, artificial intelligence is like a cheap labourand by using this labour we can make our work fast and also increase the profit,it can be deployed easily, machines do not require refreshments and breaks like humans,the machines can be re programmed for work for long time without getting bored or tired,the science of robotics and artificial intelligence can be deployed into mining and other fuel exploration process by this way we can save human life because human can make new robots but we cannot make that human, it can be deployed at industries and companies. [23] The basic intelligence of teachers has been changed by the emergence of artificial intelligence. Teachers usually teach students by communicating with them in traditional business English teaching. In the application of artificial intelligence products, students can assess their learning situation thus reducing the time burden of teachers to correct their homework, and giving teachers more time to understand the students' learning situation and adjust their teaching methods in time, and teach according to their own abilities. Adopt one-to-one teaching method to improve teaching quality. Artificial intelligence has effectively solved the problems faced by teachers in college reforms and improved the teaching of student resourcesand also made up for the defects in college business English teachingthus most English teachers accept and recognize big data and artificial intelligence.

Challenges or Dis-advantages of AI

[24] The problem of unemployment is one of the ethical dilemmas that can be identified.More and more work places are being suppressed due to the development of machines, increasingly specialized, has generated that from the industrial revolution to the present.Machines that are "more efficient" in economic terms have replaced jobs starting with the less qualified, repetitive jobs and in which little reasoning is needed for its execution, even more complex jobs that need surgical precision for its performance, and it has made man reinvent himself and learn other more specific trades so that they can sell his workforce and thus be able to survive in a world that demands money to preserve a comfortable lifestyle. That raises the dilemma of what will happen when the machines come to replace all the human labour that the industry needs to function? Another ethical dilemma faced by today's society is the "humanism" of the human being. Society is currently dependent on advance technologies in all aspects, from a mobile phone to machines to maintain an acceptable quality of life. This has posed that humanity wonders if freedom has been lost to technology or if it is really technology that serves the human being only when he demands it. [25] Some of the main disadvantages of Artificial Intelligence (AI) in our daily lives are it can some timemisused leading to mass scale destruction, programme mismatch sometime done opposite to the command, it effects human jobs, it caused an increase inunemployment, the creativity is dependent upon the programmer, it lacks the human touch, it is helping in making the younger generation become lazy, it require a lot of time and moneyand it has caused the increase oftechnological dependency. [26] It is not easy to develop the machines because the equipment required are expensive, itcan cost lots of cash and tons of time to create, rebuild, and repair, Robots are replacing jobs of humans, it is a major cause for severe unemployment, unless if humans can fix the unemployment with jobs AI can't do or severely change the govt to communism, destruction can be easily caused by machines if put within the incorrect hands,that is, a minimum of a fear of the various humans, AI is making

humans lazy with its applications automating the bulk of the work,humans tend to urge hooked in to these inventions which may cause a drag to future generations, AI is replacing the majority of the repetitive tasks and other works with robots, A bond with humans which is an important attribute when involves Team Management cannot be developed by machines,Only those tasks which they're designed or programmed to try to can be performed by machines and anything out of that give irrelevant outputs which might be a serious backdrop or crash. [27] The government and schools attach great importance to integrating artificial intelligence into business English education but most ideas are implemented at the professional level the main reason is that when universities formulate talent training programs, the training of artificial intelligence awareness and ability has not been really incorporated into vocational education, which has affected the development of professional talent training objects.Innovation and Entrepreneurship education will be difficult to proceed smoothly if the training goal of artificial intelligence is not included in the professional education plan.The importance of students' innovation and entrepreneurship education has not been fully realized by some colleges and universities at present, and usually just hold some lectures to cultivate students' artificial intelligence capabilities and awareness, andartificial intelligence education into the professional curriculum system is also rarely incorporated. In most business English professional colleges, artificial intelligence education is to create some courses related to artificial intelligence on the basis of the original business English courses however, in general, these courses have little to do with professional courses, they are two independent courses, there is no penetration and good integration. Artificial intelligence education is only a superficial form, which is not conducive to the development of artificial intelligence training thinking. [28]One of the main disadvantages of artificial intelligence is the amount of money it cost for the maintenance and repair. To meet changing requirements the software must be constantly updated. Any machine can fail if we set a lot of complex tasks to artificial intelligence. Huge number of consecutive problems can be caused by a small error in the calculations this can also lead to loss of important data, which is processed by machine. It can lead to unemployment if robots begin to replace a person in each field of activity. In addition, a person's mental abilities can be reduced, as the need to use their intellect and not solely depend on machines.It will cause destruction if military robots fall into the wrong hand as the machine does not think before acting.

Conclusion

I believe that Artificial Intelligence is at the centre of a new enterprise to build computational models of intelligence. The main assumption is that intelligence (human or otherwise) can be represented in terms of symbol structures and symbolic operations which can be programmed in a digital computer. Artificial intelligence has many disadvantages along with its advantages and the biggest one of the disadvantage is the problem of unemployment so I think we should not solely rely on artificial intelligence and also rely on our own intelligence.

References

Beck, J., Stern, M., &Haugsjaa, E. (1996). Applications of AI in Education. *XRDS: Crossroads, The ACM Magazine for Students*, *3*(1), 11-15.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Bouletreau, P., Makaremi, M., Ibrahim, B., Louvrier, A., &Sigaux, N. (2019). Artificial intelligence: applications in orthognathic surgery. *Journal of stomatology, oral and maxillofacial surgery*, *120*(4), 347-354.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. *Ai Magazine*, *26*(4), 53-53.

Chen, H., & Wang, F. Y. (2005). Guest editors' introduction: Artificial intelligence for homeland security. *IEEE intelligent systems*, *20*(5), 12-16.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Ding, H., Gao, R. X., Isaksson, A. J., Landers, R. G., Parisini, T., & Yuan, Y. (2020). State of AI-based monitoring in smart manufacturing and introduction to focused section. *IEEE/ASME Transactions on Mechatronics*, *25*(5), 2143-2154.

Eldrandaly, K. A., Abdel-Basset, M., & Abdel-Fatah, L. (2019). PTZ-surveillance coverage based on artificial intelligence for smart cities. *International Journal of Information Management*, *49*, 520-532.

Ganesh, D., Seshadri, G., Sokkanarayanan, S., Rajan, S., &Sathiyanarayanan, M. (2019, December). Iot-based google duplex artificial intelligence solution for elderly care. In *2019 International Conference on contemporary Computing and Informatics (IC3I)* (pp. 234-240). IEEE.

Garbuio, M., & Lin, N. (2019). Artificial intelligence as a growth engine for health care startups: Emerging business models. *California Management Review*, *61*(2), 59-83.

Gong, S., Loy, C. C., & Xiang, T. (2011). Security and surveillance. In *Visual analysis of humans* (pp. 455-472). Springer, London.

Guo, M. Advantages And Disadvantages Of Artificial Intelligence In Business English Teaching.

Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine.*Gastrointestinal endoscopy*, *92*(4), 807-812.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. *Frontiers of Information Technology & Electronic Engineering*, *18*(1), 86-96.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education.

McCarthy, J. (2007). What is artificial intelligence?.

Nilsson, N. J. (2009). The quest for artificial intelligence. Cambridge University Press.

Osipov, S. S., & Ulimova, N. V. (2013). ADVANTAGES AND DISADVANTAGES OF AI. *SCIENCE AND WORLD*, 77.

Racine, E., Boehlen, W., & Sample, M. (2019, September). Healthcare uses of artificial intelligence: Challenges and opportunities for growth. In *Healthcare management forum* (Vol. 32, No. 5, pp. 272-275). Sage CA: Los Angeles, CA: SAGE Publications.

Tao, B., Díaz, V., & Guerra, Y. (2019). Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher. *Arctic Journal*, *72*(12), 30-50.

Waisi, M. (2020). Advantages and disadvantages of aI-based trading and investing versus traditional methods.

Woolf, B. (1991). *AI in Education*. University of Massachusetts at Amherst, Department of Computer and Information Science.

Zang, Y., Zhang, F., Di, C. A., & Zhu, D. (2015). Advances of flexible pressure sensors toward artificial intelligence and health care applications. *Materials Horizons*, *2*(2), 140-156.

TOMORROWS' WORLD - AI

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What is Artificial Intelligence

[1] Artificial intelligence is study of machines and making brilliant machines and by the form of computer languages. It makes our work easier and faster and it also does not restrict the methods that are observed biologically. [2] Understanding the problem analyzing the problem and solving it in easier steps and making work simpler, solving complexed programs with logical understanding or logical approach these all comes under artificial intelligence.

History of Artificial Intelligence

[3] In the history at the beginnings of the AI it is traced to convictions, friction and imaginativeness. In most of the earlier inventions there is the involvement of artificial intelligence in the understanding program languages, it is used for the translation, it helped in learning the basic things such as knowledge representation, conclusion reached on the basis of evidence and reasoning in such a way it became a keystone in earlier times. [4] Artificial intelligence was familiar to everyone in 1950, there are several drawbacks and in earlier in extensive acceptance exercise to medicine. All the limitations are cleared and modified by the advert of learning. Now after so many changes taking place AI is capable to do many things such as over look the algorithms and learning by self. AI is then used in the medical practice even though it is risk, but it is helpful to make work more efficient and faster.

Growth of AI

[5] Artificial intelligence created huge impact on economic growth. Artificial intelligence has the capability to emulate or copy like human behavior; it is able to achieve huge range of achievements. With the help of the AI, we can do the n number of tasks at a time which cannot be performed by the human so we can do increase in number of tasks which is not possible before AI, because multi-tasking cannot be performed by the human labor. Artificial intelligence can be developed in any kind of ordinary production goods also. Now a day's everything became automated with AI, it created growth on income share and gave an opportunity to come up with new ideas and implement them, it is also helped in solving and analyzing the problems. Artificial intelligence became a fast self-improving that unbound economic growth. [6] The growth of AI in health care is dramatically as an individual who creates a business offer solutions that may change how to protect from different kinds of health regarding issues likes diagnose and helps to cure from the problem .From this article we came to know that examination of AI in medical health care beginners and found appear or come out with different business model which helps to bring Artificial intelligence know all over the world and bring to the public.AI in a medical care trying to bring out business models into all AI medical care beginners.

AI in Health Care Appliances

[7] The most important uses of Artificial intelligence in medical is data segregating also keeping everything in a order by arranging it and tracing them .It is the initial step of stating the change in

health care systems, recently AI got a privilege of storing the statistics of medical reports. It is a fantastic health services The one of the prime step in health we segregate all the important data ,reports when we make it with the help of Artificial intelligence it become easier to order them automatically with the help of the robot instead of human even work will done more faster. [8] Artificial intelligence is used in taking care of elder's health with the help of technology, there are times we always may not be with them and they require help from ours we can get to know their situation and proctoring them with the help of the machine, it is very helpful for ous in this generation in these busy life's this helps to ous to give a relation on our parents help. Even we got monitoring beds for the elders which them to not fall from their bed or maintain a position for sleep without moving and gives a relaxed sleep for them .Now a day's more and more inventions coming in Artificial intelligence we got speech recogniser it recognizes our words understand the human commands and perform them as per what we said these work with the help of the artificial intelligence and also with the help of internet of things also, so many appliances are controlled by artificial intelligence now a day's fans, TV and emergency warning alarm and all. [9] Artificial intelligence is used for psychological or mental condition it is used in diabetes it is used for facial recognition it helps to identify the face of the patient and helps to get his data of previous medication and condition of the student. It is also helpful in gathering sorting or segregation the patient's photo, id, details and previous visits details, their x rays, scanning, medication and all. It helps the work to make easier with machine that a human spends so much time with help of machine it is done faster and more efficient than human.

Manufacturing and Production in Artificial Intelligence

[10] Manufacturing and production of Artificial intelligence is rapidly increasing rapidly with lot of new batches of products are coming to satisfy the costumer better. Suppose for a factory we require lot of humans for making, packing and segregation of things but now they are making simpler with Artificial intelligence with the help of multi-tasking machines, some more automatic robots and machines burden of work is reduced. A new generation machines are done by collaboration and more service models which helps to customize our own model for our own way of work. By teaching them way of packing, way of arranging, and all. [11] AI created a great sensation such a way that each and everyone by knowing or unknowingly involved with Artificial intelligence, it is involved in each and every aspect from toys to mobiles. Even in small exciting automatic toys there is an Artificial Intelligence. By making intelligent and customizable machines and providing the product to the costumer, [12] when there is a continuous development of in science and technology in our day to day life ,It is difficult to live without AI in our life .With all these AI machines our life became easier than before to do our daily works .The ability of a computer machine to operate or access and process information like human beings is called as Artificial intelligence. We analyzed a vast development in the' internet plus AI' now a day's which can change, model, process of a system.

AI in Security and Surveillance

[13] Government is trying to bring Artificial Intelligence surveillance techniques global wide trying to bring into effective action specific policy .Government decided to bring smart city and smart world by making the works digitalized like face reorganization which helps to recognize the employee as ID, And smart policing by alert, accountable, reliable and responsible, The reason

behind smart policing is finding the persons criminal history for finding more details about the victim, crimes that are done by him ,no of times get caught and arrested these all comes under smart policing. [14] Due to the huge development of Artificial intelligence it is being taken by different countries they are trying to adopt it to their culture to artificial intelligence from mankind. By the decision of corporate AI is coming into their action, AI arm-controlled robots can perform all the actions what a human can do in his life due to the higher security problems arising these arm-controlled robots are used. Not only that now a day's Artificial Intelligence came into military also, government are very particular about military so they wanted to make costly robot which is arm controlled and perform all actions that a human does, this decreases risk of the country. [15] During the COVID-19 pandemic situation Artificial intelligence came out with their new developments with tractile development which depends on 5G, they tried to control the covid internationally with the help of this, 5G increases speeds by up to ten times that of 4G, where as mobile edge computing reduces latency by bringing computer capability into the network, closer to the end user, AI I taught of training the models about covid treatment to decrease to death rate of covid. But there are two disadvantages sue to this situation of covid is keep on changing rapidly so we require to train them accordingly, training in a very short time is very difficult. But it was implemented in some aspects such as monitoring or maintaining the personal check of the social distancing, checking the temperature and even in different scanning's and x rays.

Artificial Intelligence in Education
[16] AIED means Artificial Intelligence in Education, AIEd can provide learning opportunities today and in the future. With the goal of increasing everyone's learning and life outcomes. Throughout, we've taken the approach of starting with teaching and education. And then describe how effectively designed and are implemented. Although a few would possibly discover the idea of AIEd alienating, the algorithms and fashions that include AIEd shape the foundation of an basically human endeavor. AIEd gives the opportunity of studying this is greater personalized, flexible, inclusive, and engaging. [17] The Student is asked to clear up some of troubles and to enter intermediate hassle fixing steps. The tutoring machine compares the hassle-fixing route accordingly generated to a really perfect route - primarily based totally on professional performance. In general, maximum ITS structures cope properly with conditions where the student's solution differs from that of the professional model. If a remediation flow is needed, this takes the shape of a proof of what step the professional proposes and why that is taken into consideration the proper step to take. [18] Artificial Intelligence has created a huge impact in the education. In some cases it is better than teachers what they teach us .It helps to manage a class better than what a teacher can do with the most appropriate answers in the simplest steps And also with the minimalistic steps with the advanced learning with most intelligent tutorials .Artificial Intelligence for the best efforts of teaching and most experienced and effective teaching.

Advantages of Artificial Intelligence
[19] In case of decision making Artificial Intelligence based on the facts whereas decision making other than Artificial Intelligence or human decision have some impact on the emotion and human feelings ,so Artificial Intelligence helps better in the decision making than that of human decision without any impact. And in so many other aspects also Artificial intelligence helps far better as machine need not sleep, whereas human need to sleep and rest due to the stress, restlessness, and

tiredness due to the work .Where without all these also a machine can work efficiently. [20] Artificial intelligence (AI) packages are used to simulate human intelligence for both fixing a trouble and creating a selection. AI offers the benefits of permanency, reliability, and value-effectiveness at the same time as additionally addressing uncertainty and pace in both fixing a trouble or accomplishing a selection. AI is rigorous use within side the Internet together with in seek engines. [21] Natural language process this means a way it acts as a translator One of computer science's long-standing ambitions is to train computers to understand our language. Natural language is the next generation of computer language. Scientists working on Artificial Intelligence have succeeded in creating Natural Intelligence. To a considerable extent, the language interface relies on a limited vocabulary and syntax. Language in Its Natural Setting. Processing enables a computer to comprehend the key linguistic concepts contained within a query or statement. Its mission is to create and build computers that analyse, comprehend, and generate information. In this case Artificial Intelligence helps to convey the human needs better by understanding the way we act and the language we speak. [22] Machine learning has demonstrated its ability to detect and diagnose issues in building energy systems. This summary was collected or analyzed from last two decades. Summarizing the qualities and weaknesses of existing artificial intelligence-based methods and identifying the most important future research tasks. First, the difficulties in creating FDD approaches for building energy systems are explored. After that, a thorough literature study is conducted. All methods are divided into two categories: data-driven and knowledge-based. There are many data-driven methodologies, such as classification-based, unstructured learning-based, and regression-based. They demonstrated a strong ability to learn patterns from training data. However, they require a considerable quantity of training data and have reliability and robustness issues. [23] The advantage of Artificial Intelligence in Fashion. In recent times it was introduced to the fashion now a day's Firms, particularly fashion companies, are confronted with a new interaction between consumers, suppliers, and rivals as the big data era unfolds. Fashion companies must also manage a variety of data with numerous and complicated linkages and dependencies, as well as human factor uncertainties. It is critical for businesses to master these data flows in order to make better decisions. Artificial intelligence techniques are very effective in such scenarios. Artificial intelligence's possible uses in the fashion sector range from design support systems to fashion recommendation systems, as well as sensory evaluation and intelligent suggestion systems.

Disadvantages of Artificial Intelligence

[24] Artificial Intelligence have a chance of creating destruction if it is misused or if it is kept in the wrong hands ,So we need to properly utilize it in a proper way without misusing it. Responses are lacking in creativity and logical solving. Sometimes it is unable explain logic behind. Currently, AI development is reached a point where it can no longer be used. Currently, AI development is reached a point where it can no longer be used. When there isn't a solution to a problem, you'll be able to tell. Any malfunctioning on the AI's part could result in it creating, incorrect solutions, and since it is unable to describe the Blind reliance on AI can be dangerous since it lacks the thinking behind its answer. Common sense plays a key role in solving a problem in some questions. Artificial Intelligence doesn't have common sense so it is not able to solve major problem. If given the opportunity, it can be used to create massive destruction, [25] if it falls into the wrong hands in wrong hands it will be misused and cause as a disadvantage .It causes unemployment because due to this work is becoming similar with help of machines and decreasing man power so that it causes

unemployment. And affects a Human life due to unemployment. Creativity is more in programming than a human thinking. In that case also a programming is more efficient than human work. Some time it is able to be misused main to mass scale ruin, Unemployment trouble increased, Creativity is depend on programmer, Lacks the human touch, Younger era turns into lazy. [26] This artificial Intelligence making youth unemployed and making them lazy due to less jobs it is creating less interest towards job. Require time and money, we need to invest so much money on creating machines and buying huge machines. Apparatus and equipments to make machines are expensive. Tons of amounts to create a successful machine Robotic restore can arise to cut back time and people trying to restore it, however that'll price extra cash and resources. Robots, with them changing jobs, can purpose extreme unemployment, until if people can restore the unemployment with jobs AI cannot do or significantly extrade the government to communism. Machines can, without difficulty purpose destruction, if placed in the wrong hands. That is, not less than a worry of the numerous people. As AI is changing the bulk of the repetitive obligations and different works with robots, human interference is turning into much less which can also additionally purpose a sizable hassle in the usage standards. Every employer is trying to alternate the minimal certified people with AI robots which can also additionally do comparable paintings with more efficiency. [27] Lot of data is required for creating an AI for making it properly and accurately so it's time consuming and costs a lot of money. Due to huge growth in AI some companies are trying replace their jobs with AI robots this can lead to huge unemployment which may put pressure on countries economy. AI machines can cause a lot of destruction, if put within incorrect hands, nowadays some countries trying to implement AI into nuclear weapons so that they can track enemy with high resolution camera and it can hit enemy accurately even if the enemy is moving this may cause lot of destruction. Machines can't develop bond which is very important during a team management. Machines can only perform the task which they designed or programmed for we a machine cross the boundaries of the program it may crash or it may give irrelevant output which may cause a backdrop.] Unlike humans Artificial Intelligence only works on logic and program so it lacks in creativity. Artificial Intelligence can't explain the reasoning and logic behind certain decisions, Artificial Intelligence always can't be perfect it may have errors that can lead to malfunctioning of the system. [13] Another major problems of Artificial Intelligence programs is that if it has bugs it may lead to crashing of the system this causes loss important data, every machine can't be perfect some may have bugs in it and it AI cant correct itself this should be solved in supervision of an AI engineer who cost lot of charges for solving the bug this can be more time consuming. Artificial Intelligence can turn into threat if it falls to wrong hands which may cause large scale destruction. AI has no emotion and it only works on logic and program it doesn't know what is right or what is wrong it just follows the program and the task it's made for so There is a fear that if AI robot are weaponries' then they may cause large destruction, So if AI falls in wrong hand he may order it to do wrong things like robbing etc. this could be a threat to the society.

Conclusion
My opinion on Artificial Intelligence is there are both Advantages and Disadvantages in Artificial Intelligence, But there are more advantages in artificial intelligence as compared to disadvantages, In my opinion according to paper the only main disadvantage of artificial intelligence is it should not get into wrong hands ,until unless it gets into wrong hands all works can be done in an efficient manner and It maintained a active role in the health decisions eg during the covid times and all,

during social distancing etc. It maintained key role even in armay at a point of time, the whole world became smart world due to AI with the new technologies all devices became voice control and device controlled even fans, light and all also became very modern due to Artificial Intelligence. It created immense effect on education as the teaching became easier with AI able to monitor huge members at a time, able to explain the correct logic behind . As it does not need sleep, rest, food it works more orderly.

References

Aghion, P., Jones, B. F., & Jones, C. I. (2019). 9. Artificial Intelligence and Economic Growth (pp. 237-290). University of Chicago Press.

Allen, G. C. (2019). Understanding China's AI strategy: Clues to Chinese strategic thinking on artificial intelligence and national security. Washington, DC: Center for a New American Security.

Andriessen, J., & Sandberg, J. (1999). Where is education heading and how about AI. *International Journal of Artificial Intelligence in Education*, *10*(2), 130-150.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intelligence. *Aayushi International Interdisciplinary Research Journal*, 227-230.

Buchanan, B. G. (2005). A (very) brief history of artificial intelligence. Ai Magazine, 26(4), 53-53.

Charniak, E. (1985). Introduction to artificial intelligence. Pearson Education India.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. *Artificial intelligence applications to critical transportation issues*, *6*(3), 360-375.

Conati, C., Porayska-Pomsta, K., & Mavrikis, M. (2018). AI in Education needs interpretable machine learning: Lessons from Open Learner Modelling. *arXiv preprint arXiv: 1807.00154*.

Feldstein, S. (2019). The global expansion of AI surveillance (Vol. 17). Washington, DC: Carnegie Endowment for International Peace

Garbuio, M., & Lin, N. (2019). Artificial intelligence as a growth engine for health care startups: Emerging business models. California Management Review, 61(2), 59-83.

Hossain, M. S., Muhammad, G., & Guizani, N. (2020). Explainable AI and mass surveillance system-based healthcare framework to combat COVID-I9 like pandemics. IEEE

Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine. Gastrointestinal endoscopy, 92(4), 807-812.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. *International Journal of Library & Information Science (IJLIS)*, *9*(1), 3.

Lee, L. W., Dabirian, A., McCarthy, I. P., & Kietzmann, J. (2020). Making sense of text: artificial intelligence-enabled content analysis. *European Journal of Marketing*.

Li, B. H., Hou, B. C., Yu, W. T., Lu, X. B., & Yang, C. W. (2017). Applications of artificial intelligence in intelligent manufacturing: a review. Frontiers of Information Technology & Electronic Engineering, 18(1), 86-96.

Lu, H., Li, Y., Chen, M., Kim, H., & Serikawa, S. (2018). Brain intelligence: go beyond artificial intelligence. *Mobile Networks and Applications*, *23*(2), 368-375.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education.

McCarthy, J. (1998). What is artificial intelligence?.

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In *Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi*.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Patel, P., Ali, M. I., & Sheth, A. (2018). From raw data to smart manufacturing: AI and semantic web of things for industry 4.0. IEEE Intelligent Systems, 33(4), 79-86.

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. *Science [ETEBMS-2016]*, *5*(6).

Tawalbeh, M., Quwaider, M., & Lo'ai, A. T. (2020, April). Authorization model for IoT healthcare systems: case study. In 2020 11th International Conference on Information and Communication Systems (ICICS) (pp. 337-342). IEEE.

Teng, X. (2019, April). Discussion about artificial intelligence's advantages and disadvantages compete with natural intelligence. In *Journal of Physics: Conference Series* (Vol. 1187, No. 3, p. 032083). IOP Publishing.

Wan, J., Li, X., Dai, H. N., Kusiak, A., Martínez-García, M., & Li, D. (2020). Artificialintelligence-driven customized manufacturing factory: key technologies, applications, and challenges. Proceedings of the IEEE, 109(4), 377-398.

WATANUKI, K. (2019). Artificial Intelligence, Internet of Things and Human-Machine Interface in Healthcare and Manufacturing. In The Proceedings of Mechanical Engineering Congress, Japan 2019 (p. C12200). The Japan Society of Mechanical Engineers.

Zhao, Y., Li, T., Zhang, X., & Zhang, C. (2019). Artificial intelligence-based fault detection and diagnosis methods for building energy systems: Advantages, challenges and the future. *Renewable and Sustainable Energy Reviews*, *109*, 85-101.

ARTIFICIAL INTELLIGENCE

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What is an Artificial Intelligence?

[1] Artificial Intelligence is a part of computer science and engineering which has the capability to think like humans, process and execute program to develop a smart software. [2]. Also AI is defined as something which can mimic the characteristics that distinguish humans.Some of the popular AI programming languages are python, C++, Java and prolog. In general, AI can be something which reduces the work load of humans and also decreases the time span to do a particular work, thus, making human life easier and reliable. For example, virtual assisting software like Siri, Alexa, which are developed by multinational companies and are smart enough to give appropriate result to whatever we ask through voice command. Also software like chrome search engine which automatically gives option relevant to what we search. As learning programming related to AI can process data analysis with precision and speed beyond human capacity, artificial intelligence (AI) applications and machines have become increasingly common in finance, education, health care, the legal system and beyond. However, relying more on AI than human also has risks, especially where decisions are made without human permission. Machine learning relies more on pattern-recognition within data-sets. Problems arise when the available data reflects societal bias.

History of Artificial Intelligence?

[3] The beginning of Artificial Intelligence was started with the invention in electronics like supercomputers which was IBM 702 and slowly it went on solving problems and developing programs which can help in language translation, proving theorem and knowledge-based system. [4] Artificial Intelligence was first observed by John McCarthy in the year 1950,however, many limitations was observed in the field of medicine at that time. But in the early 2020s, many of the limitations were overcome by deep learning and grabbing knowledge in this field. Now Artificial Intelligence is capable of self learning and understanding difficult algorithmic problem and analyze it. During 90s, Many Scientist predicted that the growth of AI machines can be made in no more than a generation, also they predicted that this machines will be more intelligent, fast and accurate in problem solving. So as of now, we can see that whatever prediction were made by them came true and now we are living in a world where artificial intelligence and many other technologies has made human life very easy and convenient. During 1980s, Japanese government invested $400 million dollars with the aim of developing a advanced computer which will help in solving logical programs. But unfortunately this project failed and most of the ambitious goal weren't met. However, this failure has inspired the talented young generation who are in the field of computer science, so ultimately this failure was valued and AI fell out under limelight. Now we live in the age of 'Big data', an age where huge sum of information are collected and in order to view a particular data, AI technology is used.

Growth of Artificial Intelligence

[5] Artificial Intelligence has the capability of adapting intelligent human behavior or has the ability of achieving goals in industrial, medical, educational and even in banking system, which will

ultimately lead to economical growth. Artificial intelligence does all those work which was previously performed by humans labor in the industries to became self-automated. Artificial Intelligence has also played vital rolefor the production of goods and services in industries,and thereby impacting in the economical growth and income share.[6] Artificial Intelligence has also shown greattechnological growth in the field of medical science such as risk analysis,lifestyle management and monitoring,health information management and virtual health assistance. However, this teleological growth has lead to the increase in unemployment issue and job problems for many people. AI has also shown its value in the online shopping sites like amazon, flipkart, snapdeal, Alibaba express and many more. Apart from industrial growth, AI can also help in creating a sustainable food system that will ensure the quality of food by analyzing the amount of fertilizer, and pesticides used in farm and will also help in increasing the productivity and reduce the environmental impact. Robots could remove weed, lowering the use of herbicides. For example, many farms in Europe already use AI to monitor the activities performed by the farmers, temperature and feed consumption of the animals, which will ultimately lead to good production and great income shares.

Artificial Intelligence in Health appliances
[7] Artificial Intelligence in the field of health care industries as well as clinical and public sector has brought appliances which help in treating different types of disease like cancer,neurology and cardiology.It has also brought machines, deep learning and active assisting instrument to handle prearranged data.[8] Artificial Intelligence can detect patient disease and also provides information to the physician so that he can make excellent decision for treating the patient. Present generation doctor's does not have to learn by heart everything as the digital technology has given liberty to focus more on mental energy or high level cognitive tasks and patient concern.[9] Doctors and other medical expert use artificial intelligence to make things more accurate and fast. AI also help bio tech scientist to prepare antidote of a particular virus in less time span. During covid-19 period, AI has been used as thermal imaging in airports and elsewhere too. In hospital, it has been used to recognize the infections from computerized tomography lung scan. Also it provides data to track the spread of a particular disease. Presently, Researchers are working on how to develop an AI program which will help to analyze large quantities of health data and accordingly can visualize which could lead to discoveries of new medicine and way to improve individual diagnostics. One of the new AI program developed by researchers was answering to emergency call that help to recognize a cardiac arrest during the call faster and more frequently than medical dispatchers.In another example, EU co-funded KConnect which is a multi-lingual text that search to give services that help people find the most relevant medical information available.

Artificial Intelligence in Manufacturing and Production
[10] Artificial Intelligence in the field of manufacturing and production has brought remarkable change as it has showed increment in economical growth in the past five years. [11]Artificial Intelligence in manufacturing is a general concept under development.It is categorizes into three paradigms: digital manufacturing,digital network manufacturing, and new generation intelligent manufacturing. New generation of artificial intelligence plays important role in the revolution of new industry and will continue to be the main source for the transformation and upgrading of the manufacturing and production industries in the years to come. [12] Large scale industries are

continuously enhancing and developing new smart machines to increase the number of production in less time interval. Also due to this, labor cost decreases leading to huge profits. This AI machines are programmed in a way that it can sense, learn, analyze, predict and execute to do a particular work. AI can help the Indian industrial manufacturers to become more efficient and bring more industries in India if they use robots for manufacturing purpose to optimize the sale path or by on time predicting of maintenance and breakdown in smart factories.

Artificial Intelligence in Security and Surveillance

[13] Human eyes are highly efficient to capture large quantity of low level visual sensory data and deliver only those information which are useful to one's brain for high level interpretation and situation awareness.[14] Recent development in Artificial Intelligence has suggested that this emerging technology will influence the military power and the world politics more broadly. [15] Some schools are acquiring advanced artificial intelligence surveillance technology including face recognition and geolocation tracking device in order to strengthen security so that no intruders can get inside the school for bad intentions. Also it helps the faculties in paper checking and analyzing each students performance so that they can know each students strength and weakness and change themselves according to students aspects.

Artificial Intelligence in Education

[16]In the field of education, Artificial Intelligence has wide impact.

First, we have to understand the difference between Education Technology (Ed Tech) at large and artificial intelligence in education (AIED) specifically. Education Technology (Ed Tech) refers to implementation of technologies by students in schools or colleges. The aim of Ed tech is to improve the students to learn more efficiently, enhance their individual skills and also it helps reduce the teaching burden on faculties.[17] In the field of artificial intelligence in education (AIED) has undergone significant developments over the last twenty-five years. The main aim of AIED is to increase the speed and efficiency of work we do in the education field, also it helps the faculties of school or colleges to analysis students performance individually.[18] Using AI, Students can get education through innovative virtual learning, and data analysis. Grading and evaluation of paper can also be done using Artificial Intelligence.

Advantages of Artificial Intelligence

[19]Artificial Intelligence reduces the time taken to do a specific work which can either be problem solving or decision making. Artificial Intelligence can be applied in the field of education, medical, industrial and also it is used rigorously in the search engines likes chrome, safari.[20]Artificial Intelligence can do all the stressful and complex works faster than a human, has less errors and defects, functions is infinite, can also discover things which is not explored and many more.[21]One of the most important advantages Artificial Intelligence is that it makes decisions on facts rather than emotions, whereas humans decisions are always affected either by emotions or by anger. Also unlike humans, machines does not need any sleep or gets tired or stressed while playing or working.[22]Machine with artificial intelligence has a very advanced brain which can solve problems faster than humans and will never forget. Artificial intelligence are also used by doctors for the early detection of colorectal cancer which was the second ranked worldwide spread cancer during 2020.[23] Artificial Intelligence is also used in social media like Facebook, Twitter,

Instagram, and Snapchat where billions of people have an account any of it and all the accounts and details are managed and stored by AI in a very efficient way and it analyze many data on the spot and show pictures or videos to the newest trend. Presently, even car have special features like self driving, navigation through voice command and many more possible because of AI technology. Language translation software like Google translation is also a part of AI which can translate any language into which language language we are comfortable in either by writing or through voice command. Under transportation, AI could provide safety, speed and efficiency to rail traffic by decreasing the wheel friction, increasing the speed and can also enable autonomous driving. Using wide range of data and pattern recognition, AI could provide early warning of natural calamities and can help in sufficient preparation before meeting the consequences.

Challenges or Dis-advantages of AI

[24] AI machines cannot be easily develop as the equipment required are very expensive, also it requires times, energy and human intelligence to make such machine. [25]With the increase in AI machines, unemployment can also increase as the works will be done by this machine. Also with the increase in AI technology, humans are getting lazy specially due to smart phones, internet, etc.[26] Increase of Humans dependency on technology can makes humans less creative and also will lead to decrease in thinking capacity to solve a particular problem.[27] The importance of integrating artificial intelligence into business English education has not realized by some colleges. The main reason is that when college plans for talent training programs, they don't take artificial intelligence under main concern rather they include it into vocational education, which has affected the personal development of the students as well as the innovation and entrepreneurship education will be difficult to proceed smoothly.[28] Machines are not capable to thing out of box and do a particular work, they can do only those work which they are programmed for.

Conclusion

Since we are living in a modern age where artificial intelligence and many other technologies are at some peak, so it is very important for us to make right use of technologies like Smart phones, Laptop, etc and not get addicted to social medias or any other games present in it. Artificial Intelligence has both positive and negative impacts on human life. The positive impacts are it has made our life easy as it reduced the time taken to do a specific work. Specially in education, AI applications has great potential as it has showed significant improvement in the quality of education and enhancing the teaching and learning method. Smart classes, E learning, correction of exam papers and analyzing student performance are all done by AI. Smart phones and laptops with internet connection are great weapons for students as they can learn anything whatever they want to. Also it has great impact in industrial, and medical science. In industries, large scale work are performed by the AI machines and reduces the work load of the workers. And in medical science, AI algorithms are used to monitor and take care of patient, diagnosis particular disease, and analyze large amount of data through electronic health record to prevent disease and diagnosis. As of know, artificial intelligence can do only those work which they are programmed for. Now, the negative impact are, it has made human lazy, increased unemployment as some jobs opportunities will be taken over by artificial intelligence. For the military purpose, automatic weapons developed with the help of artificial intelligence which are programmed to kill and if this technology goes in wrong hand could cause mass casualties. Moreover, with increase in this type of weapons can lead to AI

war which will also result in mass casualties.AI has been increasingly involved in the making of decision. In many situations, the impact of the decision on people specially women are found to be biased mostly in the areas of medical treatment, employment, judicial sentence, etc.. Automated decision-making can therefore perpetuate social divides. Countries like Japan, USA, China are already strong in digital industry and business to business application. Presently,AI has always been a part of the military army and has helped them in them process of catching terrorist either by hacking or phishing method. Also in the online platform, AI is programmed to react to unlawful and appropriate online behavior.

References

Aghion, P., Jones, B. F., & Jones, C. I. (2019). 9. Artificial Intelligence and Economic Growth (pp. 237-290). University of Chicago Press.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. Aayushi International Interdisciplinary Research Journal, 227-230.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. Ieee Access, 8, 75264-75278.

Chowdhury, M., & Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Das, S. K., Adhikary, G. N., Islam, M. N., Paul, B. K., & Das, G. G. (2004). Artificial insemination (AI) by raw semen: Its advantages and disadvantages in Deshi chicken (Gallus domesticus). International Journal of Poultry Science, 3(10), 662-663.

Gong, S., Loy, C. C., & Xiang, T. (2011). Security and surveillance. In Visual analysis of humans (pp. 455-472). Springer, London.

Guo, M. Advantages And Disadvantages Of Artificial Intelligence In Business English Teaching.

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial intelligence in education. Boston: Center for Curriculum Redesign.

Johnson, J. (2019). Artificial intelligence & future warfare: implications for international security. Defense & Security Analysis, 35(2), 147-169.

Kaul, V., Enslin, S., & Gross, S. A. (2020). History of artificial intelligence in medicine. Gastrointestinal endoscopy, 92(4), 807-812.

Khanzode, K. C. A., & Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. International Journal of Library & Information Science (IJLIS), 9(1), 3.

Kusiak, A. (1990). Intelligent Manufacturing. System, Prentice-Hall, Englewood Cliffs, NJ.

McCarthy, J. (2007). What is artificial intelligence?.

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi.

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Newell, A. (1982). Intellectual issues in the history of artificial intelligence. CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF COMPUTER SCIENCE.

Racine, E., Boehlen, W., & Sample, M. (2019, September). Healthcare uses of artificial intelligence: Challenges and opportunities for growth. In Healthcare management forum (Vol. 32, No. 5, pp. 272-275). Sage CA: Los Angeles, CA: SAGE Publications.

Rauterberg, M., & Felix, D. (1996). Human errors: disadvantages and advantages. In Proceedings of the 4th Pan Pacific Conference on Occupational Ergonomics (pp. 25-28).

Roll, I., & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. International Journal of Artificial Intelligence in Education, 26(2), 582-599.

Satpathy, S., Nandan Mohanty, S., Chatterjee, J. M., & Swain, A. (2021). Comprehensive Claims of AI for Healthcare Applications-Coherence Towards COVID-19. In Applications of Artificial Intelligence in COVID-19 (pp. 3-18). Springer, Singapore.

Schuh, G., & Scholz, P. (2019, August). Development of a framework for the systematic identification of AI application patterns in the manufacturing industry. In 2019 Portland International Conference on Management of Engineering and Technology (PICMET) (pp. 1-8). IEEE.

Sensmeier J. Harnessing the Power of Artificial Intelligence. Management 2017;48:14-19. Nursing

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Strong, A. I. (2016). Applications of artificial intelligence & associated technologies. Science [ETEBMS-2016], 5(6).

Tao, B., Díaz, V., & Guerra, Y. (2019). Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher. Arctic Journal, 72(12), 30-50.

Viscaino, M., Bustos, J. T., Muñoz, P., Cheein, C. A., & Cheein, F. A. (2021). Artificial intelligence for the early detection of colorectal cancer: A comprehensive review of its advantages and misconceptions. World Journal of Gastroenterology, 27(38), 6399.

Weinstein, M. (2019). School of Surveillance: The Students' Rights Implications of Artificial Intelligence as K-12 Public School Security. NCL Rev., 98, 438.

Zhou, J., Li, P., Zhou, Y., Wang, B., Zang, J., & Meng, L. (2018). Toward new-generation intelligent manufacturing. Engineering, 4(1), 11-20.

THE PAST, PRESENT AND FUTURE OF ARTIFICIAL INTELLIGENCE

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What is AI?

[1] Artificial intelligence is field which consist of production of smart computer and intelligent machines or programs. Artificial intelligence is similar to using computers to understand human behavior or their smartness but not restricted to methods that are biologically observable.

[2]Artificial intelligence is a part of computer science as it is surrounded by fields related to computers, cognitive science and psychology. Artificial intelligence mainly deals with the tasks that requires human intelligence and smart approach towards that task.

History of AI

[3] In 1956 John McCarthy become the first person to described the term Artificial intelligence which caught the attention of researches worldwide and was also discussed at a conference at Dartmouth. later next year the first problem solver was tested and McCarty was stated as father of Artificial intelligence. LISP (language for creating Artificial intelligence software) which is still in use nowadays for list processing was announced by McCarthy. In 1956 scientist named Herbert Simon stated that in next 20 years AI or machines can be able to any work that a man can perform but later man of the scientist realized that an algorithm than can replicate human work cannot exists. Today we have different meaning of artificial intelligence which is to produce machines or software that can help us in our work efficiently.

[4] At the early state of Artificial intelligence it was related to imagination, philosophy and fiction. It was also influenced by inventions in electronics and engineering fields. some early works in Artificial intelligence were problem solving including basic work in learning, representation of knowledge and demonstration with interpretation of programs in understanding language, translation and associative memory.

Growth of AI

[5] the economic progress from last 150 years is driven by automation as industries use steam and electricity to automate many productions process but artificial intelligence is the next change in this process. It can be MRI machine which are used in healthcare, autopilots in cars or machines or any software or machine replacing human. AI is not only replacing old methods but also providing us quality output or products.

[6] Artificial intelligence is already impacting productivity of scientists and researchers in different fields. AI helps them in searching anything the want from vast knowledge and also providing them new knowledges. Burden on scientists had been reduced a lot. AI also predicts which piece of knowledge will be more relevant to researcher or which combinations of existing knowledge will be useful to him.

AI in Healthcare Appliances

[7] Digital consultation- There are some bots made using AI such as Babylon and uMotif that can help patients by sending messages to them about their health or can reply queries related to any medication, can suggest doses.

- Robotic surgery- Using AI computer or robot assisted surgery is common nowadays. The invention of robot assisted surgery was to overcome limitations of preexisting minimally invasive surgical procedures and to support surgeons performing surgery.
- Management of diabetes- Using AI to analyze or to check diabetes of a person help patients a lot by reducing the intra and inter-observer variability. The use of Artificial intelligence improves the outcome with more precision and maximum speed. The system named Rhythm forecasts and manages blood glucose level of people with diabetes, relied only on non-invasive biometric sensors and AI.

[8]some artificial intelligence tools or applications in cardiac management

- Support vector machine (SVM)- it is used to solve the classification of two groups
- Naïve Bayes (NB)-used to learn conditional probability
- K-means
- Artificial Neural Networks
- Gradient Boosting

[9]

- Managing medical records and knowledge
- Treatment design
- Different variety of tests
- Creation of drugs

AI in Manufacturing and Production

[10] Modern manufacturing and production systems are supported by powerful AI or computing networks. With the help of sensors, machines, smart devices and people, data is being analyzed efficiently and better than ever before. Advanced computation and artificial intelligence can be seen in majority of the manufacturing factories.

[11] Artificial intelligence is commonly used in manufacturing and production of food and beverages. AI has made a huge impact in food industry as automatic machines can produce good quality of product more efficiently and fast than other ways. Standards of food is increasing day by day as from cooking to packing everything can be done by machines and also provides high quality and healthy food.

[12] Artificial intelligence in manufacturing and in factories is helping environment a lot. Not only environment but AI is also cost friendly and effective than other options. Using AI makes less wastage of raw products which help both environment and the investor.

AI in Security and Surveillance

[13] With the day-by-day development in technology and science, security and surveillance are becoming easy than before. The invention of unmanned aerial vehicle(UAV) and camera surveillance systems (CSS) provided ha huge boost for practical application related to security and surveillance. However, there are some risks and challenges such as transmission of data and process but we can overcome them in future.

[14] As human surveillance is still required in all surveillance systems, which is very challenging but with new advancement in computer science and artificial intelligence can be overcome. A CCTV based auto thief detection system with the use of motion sensor which can notified the security using the real time movement analysis of any human.

[15] There are a lot of applications of artificial intelligence in military and police all over the world. Such as in cybersecurity and in defense of a nation. The use of AI in cybersecurity surveillance has reduced the number of labor use in surveillance. In military defense most of the nations are already into robotics or advanced aircrafts to make their defense strong.

AI in Education

[16] Inclusion of Artificial intelligence in our education system is increasing day by day as most of the people depends on technology in their daily life. Artificial intelligence in education has its own advantages like better understanding to some concepts with animated videos, helping teachers to decrease their workload and more. but in classroom AI is having a huge impact than you can think, most important is that the relation between teacher and student changing a lot. Nowadays teachers are mere facilitators of the learning process, rather than someone who is good at his subject and can teach others or solve their doubts.

[17] one of the main drawbacks of addition of Artificial intelligence in education system is verbal communication of computers. Communication skills is one of the most important aspect of life which is must for any student to grow but computers are weak in verbal communication whereas teachers have many different types of skills both verbal and non-verbal to convey information like speeches or gestures which play an important role in education or teaching. To improve verbal communication of computers it requires more money and research which can be improved in upcoming years.

[18] Twenty years ago,computer-basedtraining (CBT) and computer aided instruction (CAI) were introduced in the field of teaching. Both these were the first systems used to make teaching or education better using artificial intelligence. These systems were based on the instruction given by the author not according to particular learner which has changed a lot with time.

For example: if question 5th is answered correctly then only go to 10th question otherwise go to 15th question.

This makes a huge impact from one person to another as one can be good as some concepts but other can be weak with those. Both CAI and CBT helped some of the learners.

All this leads to the research in the field of intelligent tutoring system (ITS) which gives flexibility to each student. It provides teaching according to the student's need.

Advantages of AI

[19] Artificial intelligence is getting in our daily life day by day due to its effectiveness, speed and accuracy in solving some problems or in decision making. AI is making human life better every day.

One of the major examples is our browser or search engine. Every person is dependent on search engine for getting their answers or to get some information. From news to entertainment or study everything is available to us just from one search.

Artificial intelligence has already proved itself to us by its ability to solve any type of problem accurately or more efficiently than human. AI can easily replace human staff by giving better decision making and fast then humans at any factory or office.

AI can gather data better than anyone and its decision making is far better than human not only qualitatively but quantitively also.

[20] Some of the advantages of using Artificial intelligence in libraries are-

As we know AI is far better than humans at intellectual tasks and problem solving which gives an advantage at the library as AI can give answers to any question more accurately and quickly than any other option.

AI gives support to the staff the library by helping them to store information and providing them that when needed. REFSEARCH is a system which can easily help us by providing solution to the certain question and also helps student in their studies by teaching them reference skills.

[21] In 2020 colorectal cancer (CRC) was the second ranked type of cancer worldwide with the mortality rate of 12.0 per 100000 people. At its early stage it can be detected and can be prevented. With the increase in use of technology in medical science, Artificial intelligence is huge help to doctors. Particularly in gastroenterology AI is providing great help. Computer-aided systems are used for diagnosis and to improve detection of polyp and its classification to prevent CRC.

[22] some advantages of AI in cyber security are:

AI is commonly used to detect harmful software such as malware, viruses, spyware and more. Without AI protection of our devices is near to impossible. As these harmful programs are increasing their strength day by day AI is also improving itself.

AI is used by governments to predict threats or any cyberattacks. AI can search, scan and gather huge amount of information from which can predict lot of attacks. Computers stores lot of information criminals and their past crimes.

AI helps government to gather information from social media which can be harmful for citizens or can start any attacks.

[23] Some more basic advantages of Artificial intelligence are:

AI can reduce work load on humans by replacing them with machines and also provide better results.

Using AI in factories can give better result in less time as compared to human workers.

We can use Artificial intelligence in deep mining which can give us fuels more efficiently as machines can be replaced but humans cannot.

We can expect mistakes from humans but machines are accurate as they are programmed and provided some work.

Challenges or Dis-advantages of AI

[24] some of the disadvantages of Artificial intelligence are:

Some of the equipment are pretty expensive which are important to make machines. So, lot of money is required to make some machines and, in their repair, more money is needed.

Causing destruction is easy with machines if they are used incorrectly.

Machines are mainly programmed to do some specific work but if they are given some different tasks sometime machine can crash and will give error.

Too much use of Artificial intelligence is making human being lazy and his ability to think and do work is also decreasing.

[25] Some of the main disadvantages of Artificial Intelligence (AI) in our daily lives are as follows.

- Human jobs are most affected by the increasing use of artificial intelligence which leads to the increasing numbers of unemployed people.
- how good the machine or program work just depends on the person responsible of coding the program.
- AI is made by humans but still misses the human emotion or feelings touch.
- AI is making human lives full of comfort but all that comfort also brings laziness to the new generation. New generation depends on technology a lot.
- large amount of money with time is required to make some of the machines to get most effective output.
- Technological dependency increased.

[26] In field of medicine and hospitals artificial intelligence plays a major role. from scheduling appointments, scheduling dosage algorithms for any patient or arranging data of all the patients. But there are some problems we face in use of Artificial intelligence as some of its practical applications are still at early stage and need some improvement.

One of the main problems with Artificial intelligence in medical field is lack of human emotions, feelings and sometime human intelligence. As use of AI is increasing day by day it is also affecting the jobs. Machines and AI is taking place of many workers not only in factories but in medical field also which is not the right thing.

[27] Artificial intelligence is great help in education system but there also come some problems with involvement of Artificial intelligence in teaching-

Every teacher connects with his student, understands their weakness and strengths on the other side robots or machines lacks emotions, machines only work with data and stats. As of now it is not possible for any machine to understand what a particular student needs to grow and learn.

Nowadays many teachers fear that they can be replaced by machine or robots, which is practically not possible as a teacher understand every student, he makes efforts to understand weakness of each of his student and what he can do to help him to achieve success.

[28]some more disadvantages are-

sometime machines can get bugs or error if some difficult tasksare given. These bugs or small error can cause consecutive problems and can also lost some of the important data.

Military of most of the countries are well equipped weapons or robots made up with Artificial intelligence. If by any chance any robot or machine fall in wrong hands, then it can cause huge destruction or any attack.

Conclusion

In my opinion Artificial intelligence is already changing this world, AI with the ability to do any task better than human and without taking any risk just make a difference to this world. with the help of Artificial intelligence this world is going to be much better place for our future generation. Artificial intelligence is having some issue, which must be taken care off. In last 10-15 year this world has changed a lot, mainly because of the new technology and machines.

As technology and artificial intelligence tend to develop more, humans will be given more support to their work. there are some tasks in human daily life which are repetitive and make them to same work again and again military and security forces of each country will develop a lot, so that they can protect their countries from unwanted terror attacks.

There are always some discussions about AI both positive and negative but the positive effects of Artificial intelligence have great value than those negatives.

References

Aghion, P., Jones, B. F., & Jones, C. I. (2019). 9. Artificial Intelligence and Economic Growth (pp. 237-290). University of Chicago Press.

Agrawal, A., McHale, J., &Oettl, A. (2019). 5. Finding Needles in Haystacks: Artificial Intelligence and Recombinant Growth (pp. 149-174). University of Chicago Press.

Amisha, P. M., Pathania, M., &Rathaur, V. K. (2019). Overview of artificial intelligence in medicine. Journal of family medicine and primary care, 8(7), 2328.

Beck, J., Stern, M., &Haugsjaa, E. (1996). Applications of AI in Education. XRDS: Crossroads, The ACM Magazine for Students, 3(1), 11-15.

Benko, A., &Lányi, C. S. (2009). History of artificial intelligence. In Encyclopedia of Information Science and Technology, Second Edition (pp. 1759-1762). IGI Global.

Bhagat, P. M. (2021). Artificial Intelligence in Healthcare.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. Aayushi International Interdisciplinary Research Journal, 227-230.

Bhbosale, S., Pujari, V., & Multani, Z. (2020). Advantages And Disadvantages Of Artificial Intellegence. Aayushi International Interdisciplinary Research Journal, 227-230.

Çaliş, B., &Bulkan, S. (2015). A research survey: review of AI solution strategies of job shop scheduling problem. Journal of Intelligent Manufacturing, 26(5), 961-973.

Chen, M., Liu, Q., Huang, S., & Dang, C. (2020). Environmental cost control system of manufacturing enterprises using artificial intelligence based on value chain of circular economy. Enterprise Information Systems, 1-20.

Chien, C. F., Dauzère-Pérès, S., Huh, W. T., Jang, Y. J., & Morrison, J. R. (2020). Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies.

Chowdhury, M., &Sadek, A. W. (2012). Advantages and limitations of artificial intelligence. Artificial intelligence applications to critical transportation issues, 6(3), 360-375.

Guilherme, A. (2019). AI and education: the importance of teacher and student relations. AI & society, 34(1), 47-54.

Horowitz, M. C., Allen, G. C., Saravalle, E., Cho, A., Frederick, K., &Scharre, P. (2018). Artificial intelligence and international security. Center for a New American Security..

Kakadiya, R., Lemos, R., Mangalan, S., Pillai, M., &Nikam, S. (2019, June). Ai based automatic robbery/theft detection using smart surveillance in banks. In 2019 3rd International conference on Electronics, Communication and Aerospace Technology (ICECA) (pp. 201-204). IEEE.

Khanzode, K. C. A., &Sarode, R. D. (2020). Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review. International Journal of Library & Information Science (IJLIS), 9(1), 3.

McCarthy, J. (1998). What is artificial intelligence?.

Mogali, S. (2014). Artificial Intelligence and its applications in Libraries. In Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi.

Mohammadi, V., &Minaei, S. (2019). Artificial intelligence in the production process. In Engineering tools in the beverage industry (pp. 27-63). Woodhead Publishing.

Mohammed, I. A. (2020). ARTIFICIAL INTELLIGENCE FOR CYBERSECURITY: A SYSTEMATIC MAPPING OF LITERATURE. ARTIFICIAL INTELLIGENCE, 7(9).

Murali[1], N., & Sivakumaran, N. (2018). Artificial intelligence in healthcare–a review.

Nadikattu, R. R. (2017). Artificial Intelligence in Cardiac Management. International Journal of Creative Research Thoughts, 5(3).

Nguyen, M. T., Truong, L. H., & Le, T. T. (2021). Video surveillance processing algorithms utilizing artificial intelligent (AI) for unmanned autonomous vehicles (UAVs). MethodsX, 8, 101472.

Osipov, S. S., &Ulimova, N. V. (2013). ADVANTAGES AND DISADVANTAGES OF AI. SCIENCE AND WORLD, 77.

Simon, H. A. (1995). Artificial intelligence: an empirical science. Artificial Intelligence, 77(1), 95-127.

Tao, B., Díaz, V., & Guerra, Y. (2019). Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher. Arctic Journal, 72(12), 30-50.

Viscaino, M., Bustos, J. T., Muñoz, P., Cheein, C. A., &Cheein, F. A. (2021). Artificial intelligence for the early detection of colorectal cancer: A comprehensive review of its advantages and misconceptions. World Journal of Gastroenterology, 27(38), 6399.

Woolf, B. (1991). AI in Education. University of Massachusetts at Amherst, Department of Computer and Information Science.

ONE STEP TOWARDS THE NEW ERA
ARTIFICIAL INTELLIGENCE

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What is Artificial Intelligence

[1] It is one of the branches of computer science which is used to make various type of new intelligent machines, and computer programs. but being an artificial thing, it doesn't restrict the method which is observed biologically. [2] Artificial intelligence is a web of computer science field that encourage us to make new intelligence machines that can response, think on their own and make decision of what it has to do next without being dependent on humanartificial intelligence word that are artificial and intelligent which has their own specific meanings artificial refers to the thing/object which is developed/made by human and intelligence refers to the ability to think and make own decision. Thus, the total word artificial intelligence refers to the manmade thing which has ability to think. This interesting topic gives an idea that one day machines artificially made things/ machines will have a great ability to think and make their own decisions or in other words that we will be able to imitate the characteristics that differentiate humans. The similar things are mentioned in old mythology and other scriptures, artefacts and literature as well. Now days artificial intelligence is able to do reasoning, planning of various plans, explain data structure, pretending outcomes. Depending on these methods statistics and probability are done.

History of Artificial Intelligence

[3] Artificial intelligence was like imaginary thing to every person until some scientists come with an interesting idea which was about artificial brain. First research about artificial intelligence wereheld in the Dartmouth college around 1965. But while doing so they came up with lot of difficulties and didn't succeed in first few attempts. Then government started to force them to stop their work cause they thoughts it was only waste of money and time. But Japanese scientists realize the importance of this revolutionary technique and started work again after 7 years again. Which inspire and give new hopes to government various industry again. [4] according to research George Boole was the first man who express the concept logical reasoning in 1847. After this the next person who start research on artificial intelligence was Alan Turing who described the concept of tuning machine in 1936. After that in 1950 Alan characterized the definition for determine the concept whether the software is intelligent or not. According to Alan's theory the software intelligent behavior is similar to the human intelligent capability. He said that software could be this much intelligent that the people can't even determine whether he is chatting to other human or machine. And this test he called Turing test. If the software were able to pass all the test then that was recognized as intelligent software and also get honor of being called intelligent agent.

Growth of AI

[5] At the first it was believed that artificial intelligence was limited only for limited works but making this assumption all wrong it has proven that artificial intelligence can be use in various number of industries. Artificial intelligence has also great role in business. Now it can complete

various algorithm within a second which is more accurate than any human being that is the reason why AI is in lead. Now days it has shown his big role in health care, entertainment, research fields etc.[6] Various industries and companies started to hire robots or any other artificial brains to make their jobs easier and way faster than humans which give them more profits compared to humans in the interview Mr. Nick smith which has spent quarter of century in computer designing stated this problem that artificial intelligence is growing way faster than human imagination which can actually will make others human jobless.

Artificial Intelligence in Healthcare Appliances

[7] like in industries and computer field artificial intelligence has also shown various miracle in health care industry. It seems that Ai will make a whole revolution in this field also. This hope has led to grow focus and investment in artificial intelligence medical appliances from both government organization and technological companies. However, there are some concerns about this also these are Lack of transparency with specific AI algorithms, privacy concerns with the data used for training AI models, And safety and liability issues with AI application in the clinical environment.[8]Pressure, defined as the ratio of the area to which force is used, is ubiquitous in the basic operations of nature and human society because of their vast use in personal electronic gadget and industrial monitoring. Rapidly updating electrical sensorics techniques and organic electronics have given their contribution significantly to the development of flexible pressure sensors, with unique advantages such as excellent flexibility, low cost and compatibility with large area processing techniques.Particularly, many flexible pressure sensors constructed on organic matter have been developed, and their sensing capabilities extend beyond the human skin, the largest sensory organ with thousands of specialized pressure-sensing receptors.Through the integration of a large area of elastic devices, active sensing matrix has been created which is an ideal candidate for electronic skin (e-skin) applications.Interest in integrated networks of sensors is also driven by promising applications in intelligent robotics,biomimetic prostheses, human-machine interaction, which greatly promote the advancement of artificial intelligence systems.Biomonitoring the health with the use of mobile in medical diagnostics and health care is another attractive application for pressure sensors. Organically made pressure sensors are not made to take the place of silicon-based devices it is made to full fill the niches in next generation various type of portable and wearable health care products for which low cist excellent foldability and light weight are highly desired. [9] societal concerns like systems level operations, Operations, or innovations like personalized medicines are used to be addressed by the health data stored in artificial intelligence. so that doctors can check or search the specific file about what they are tackling which make them doing this easy and time saving.

AI in Manufacturing and Production

[10] Increasingly ubiquitous and powerful computer network support modern productions and logistics systems. Sensors, machines, smart devices, systems constantly create tons of data in this network. By the use of this computational capabilities this data can be analyzed more broadly, faster, and deeply than ever before. With such great process it has redefined the value of artificial intelligence (AI) technology and opened a new era known as Industry 4.0 or Smart Factory.[11] According to research done on application of artificial intelligent technology in the field of manufacturing industry in last few years, it is seemed that there is rapid development of core technology in new field of Internet plus AI, that is one of the factors which is profitably affecting the

ecosystems of manufacturing, means, change in models, as well as development of AI.In terms of new development of both AI technologies and applications, broad market demands were provided by the continuous evolution of smart cities, intelligent transportation, intelligent robots, intelligent logistics, self-driving vehicles, smart economies, intelligent toys, smart communities, intelligent medical care, and smart-phones etc

AI in Security and Surveillance

[12] Artificial intelligent has not only made our life more convenience but also made us feel safe by creating various security tools. Artificial intelligence is an essential part of making out nation safer. Serious national security operations in the context of various data and technical domain challenges can benefit from creating intelligence and security information science research disciplines. [13] Cyber surveillance is moving towards the use of Artificial intelligence which is causing less labor-intensive than the traditional human surveillance methods that it has augmented or replaced. The use of machine learning can give speed to this trend which need the resources of large corporations or nation-state levels within the reach of small organizations or individuals. [14] In the terms of ambient data and connections, code driven system has reached to the more than half of the population of the earth, with the presenting the unimagined opportunities and the unexpected risks to human society. Artificial intelligence is getting a rapid speed particularly in industrial construction. But this unusual use of artificial intelligence in cyber-attacks appeared to be rather frightening. The thought of a machine that enhances one's self-knowledge through self-learning becomes sophisticated to attack things is a terrible problem for the cyber world. Most of the time, this artificial intelligencebased cyber-attacks are carried out using advanced malware that involves advanced theft techniques to avoidsecurityperimeters.Traditional cyber security methods are failed to counteract these attacks. To address these issues, a strong transport classification system using Principal Component Analysis and Artificial Neural Network is proposed to provide intensive monitoring.Further, the proposed method aims to expose the various artificial intelligence based cyber-attacks with their present-day impact and their future. The simulation is done using a self-developed autonomous agent that learns on its own.

AI in Education

[15] Humans are making use of application AI in education and it has been subject for research for more than 30 years now. In order to support lifelong learning and formal education traditional classes or workplaces are explored by these areas. Psychology, education, linguistics, neuroscience, anthropology and sociology are combined by AI to promote the development of AI. Which is inclusive, personalized, conducive environment learning, other AIED tools attractive, flexible, and interdisciplinary in itself.[16] Computers have been used in various industries and various medical fields but in the field of education computer has been used almost for 20 years now. Computer based training (CBT) and computer aided instruction (CAI) were the first system developed in order to attempt to teach using computers. But it has some faults the instructions were not separated to learners need. In this type of systems, the learner's ability were not considered. Simple example for this is 'if question 21 is answered go to question 54 otherwise go to question 32'. [17] Now days artificial intelligence is contributing a lot in education field. The term intelligent tutoring system (ITS) is often used in regard to the engineering side system competitional methods are used to explore and evaluate various alternative theories about learning. Noe scientists are trying to develop such system with can contain greater knowledge about domain increase reasoning ability about topic selection and response generation.

Advantages of AI

[18] Artificial intelligence (AI) applications are used to imitate human intelligence for decision making or problem solving. Benefits of permanence, reliability, and cost-effectiveness, and also addresses uncertainty and speed in either solving problems or reaching a decision are provided by AI. AI has been used in various fields such as, economics, linguistics, engineering law, manufacturing and medicine and for various modeling, prediction and decision support and control applications.[19] This is how Artificial Intelligence (AI) is defined Intelligence displayed by an artificial element to solve difficult problems and such a system are generally assumed Having a computer or machine. There is a huge advantage of artificial intelligence That his decisions are based on facts Emotion. It is a well-known fact that even after our tireless efforts, human decisions are always affected The negative path of your emotions, unlike humans, artificial intelligence machines do No need any type of rest it can work continuously without any hesitation, thus the loss in this works is so less compared to human work.[20] Artificial intelligence has powerful capacity to detect and analyze errors in building energy systems. It has powerful capacity in learning pattern form the available data which make work easy and need less workers and less time.[21] The robotics field is frequently described as a subgroup of artificial intelligence that is related Sensitive and motor functions. A mechanical device robot is a performs automation works, either under and type of human guideline or pre-defined program or general set Guidelines, by the use of artificial intelligence techniques.[22] In this world of big data era, companies and especially fashion companies are facing new type of communication between consumers, competitors and suppliers. Fashion companies have to arrange different types of data complex interactions and uncertainties related to their dependencies and human factors. in order to optimize their decision making It is required for fashion companies to master this flow of data. That's why this new technique artificial intelligence can be profitable for fashion industries.

Challenges or Dis-advantages of AI

[23] scientists have studied and suggested some challenges according to him one of the challenges is the need to establish a new discipline based on human innate ability, a framework for humanities that prepares students to compete in the labor market in which intelligent machines work together with human's professional. Hence the need and challenges of new literacy for higher education: - 1) technological literacy to know how their machines work; 2) data literacy to manage the flow of large volumes of data; 3) Designed to work in human literacy, anthropology, communication and as a human being.[24] Even though school and governments shown great importance to the inclusion of artificial intelligence in industrial English education, most of the ideas are executed on a professional level. The main reason is that when universities hold talent training programs, artificial intelligence recognition and competency training are not really included in professional education, which has affected the development of vocational talent training items[25] The biggest challenge faced by firms and societies is to leverage the benefits of AI technology, to create greater opportunities for both new products / services and vast productivity improvements, and to avoid the risks and disadvantages of rising unemployment and wealth inequality.[26] Some of the main disadvantages of Artificial Intelligence (AI) in our daily lives are.(a)Some time it can be misused leading to mass scale destruction, (b)Creativity is depend upon programmer,(c)Younger generation becomes lazy,(d)Technological dependency increased(e)Human jobs affected, (f)Program mismatch sometime done opposite to the command, (g)Unemployment problem increased,(h) Require a lot of

time and money, (i)Lacks the human touch,[27] some disadvantage of artificial intelligence according to government/economy issue: (a) Equipment is so expensive that is a bit difficult to arrange money to build machines.(b) It can cost lot of cash and times to create repair and rebuild. (c) Robots are replacing humans that's why problems of unemployment are causing.(d) If this technology goes to wrong hands, it can cause lot distraction it is one of the fearin human mind. (e) At the worst-casescenariowhile having internal difficulties it can leak people's personal data to another countries. Or it can delete the whole stored data which could be useful in future.

Conclusion

The modern technique developed by scientists called as artificial intelligence is use full to humans in various ways like in medical field it is used to make new devices that can be used to cure patient and lower the risks of death in lots of conditions and make doctors work easy it also save the date of that particular operation so that the new comers doctors can learn them. In industrial use it is used to lift various heavy loads as well as make new devises according to the data imbedded into them by engineers. It is also used in modern education systems to make the studies easy for the students to learn is has developed various way to make study easier like forming slides, shortening the various large formulas. In security fields human has developed lots of gadgets using artificial intelligence like cctv cameras, various types of automatic guns, satellites that observes whether the enemy military has entered in our border.This artificial intelligence is getting the faster growth as compared to other fields but it is said that the coin has two faces so it also has some disadvantages within it like it is making the human lazy to do any work, due to use of artificial intelligence in various companies lots of people has loosen their jobs, the most danger we have due to artificial intelligence is the other countries are making bad use of this to steal other country's personal data like military power. So in my opinion artificial intelligence is like a miracle that help us to make our life easier but only when we use it properly otherwise it can even make someone's life hell.

References

Aghion, Philippe, Benjamin F. Jones, and Charles I. Jones. 9. Artificial Intelligence and Economic Growth. University of Chicago Press, 2019.

Arivudainambi, D., Varun Kumar KA, and P. Visu. "Malware traffic classification using principal component analysis and artificial neural network for extreme surveillance." Computer Communications 147 (2019): 50-57.

Beck, Joseph, Mia Stern, and Erik Haugsjaa. "Applications of AI in Education." XRDS: Crossroads, The ACM Magazine for Students 3.1 (1996): 11-15.

Benko, Attila, and CecíliaSikLányi. "History of artificial intelligence." Encyclopedia of Information Science and Technology, Second Edition. IGI Global, 2009. 1759-1762.

Bhbosale, S., V. Pujari, and Z. Multani. "Advantages And Disadvantages Of Artificial Intellegence." Aayushi International Interdisciplinary Research Journal (2020): 227-230.

Charniak, Eugene. Introduction to artificial intelligence. Pearson Education India, 1985.

Chen, Hsinchun, and Fei-Yue Wang. "Guest editors' introduction: Artificial intelligence for homeland security." IEEE intelligent systems 20.5 (2005): 12-16

Chien, Chen-Fu, et al. "Artificial intelligence in manufacturing and logistics systems: algorithms, applications, and case studies." (2020): 2730-2731.

Chowdhury, Mashrur, and Adel W. Sadek. "Advantages and limitations of artificial intelligence." Artificial intelligence applications to critical transportation issues 6.3 (2012): 360-375.

Guo, Meng. "Advantages And Disadvantages Of Artificial Intelligence In Business English Teaching."

Horowitz, Michael C., et al. Artificial intelligence and international security. Center for a New American Security., 2018.

Khanzode, Ku Chhaya A., and Ravindra D. Sarode. "Advantages and Disadvantages of Artificial Intelligence and Machine Learning: A Literature Review." International Journal of Library & Information Science (IJLIS) 9.1 (2020): 3.

Li, Bo-hu, et al. "Applications of artificial intelligence in intelligent manufacturing: a review." Frontiers of Information Technology & Electronic Engineering 18.1 (2017): 86-96.

Luckin, Rose, et al. "Intelligence unleashed." An argument for AI in Education 18 (2016).

Makridakis, Spyros. "The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms." Futures 90 (2017): 46-60.

McCarthy, John. "What is artificial intelligence?." (2007).

Mogali, Shivaranjini. "Artificial Intelligence and its applications in Libraries." Conference: Bilingual International Conference on Information Technology: Yesterday, Today and Tomorrow, At Defence Scientific Information and Documentation Centre, Ministry of Defence Delhi. 2014.

Reddy, Sandeep, et al. "A governance model for the application of AI in health care." Journal of the American Medical Informatics Association 27.3 (2020): 491-497.

Smith, Nick. "Interview: Automation threatens all our jobs, says Martin Ford." Engineering & Technology 11.2 (2016): 50-53.

Strong, A. I. "Applications of artificial intelligence & associated technologies." Science [ETEBMS-2016] 5.6 (2016).

Tao, Barrios, V. Díaz, and Y. Guerra. "Artificial Intelligence and Education, Challenges and Disadvantages for the Teacher." Arctic Journal 72.12 (2019): 30-50.

Thomassey, Sébastien, and Xianyi Zeng. "Introduction: Artificial Intelligence for Fashion Industry in the Big Data Era." Artificial intelligence for fashion industry in the big data era. Springer, Singapore, 2018. 1-6.

Woolf, Beverly. AI in Education. University of Massachusetts at Amherst, Department of Computer and Information Science, 1991.

Zang, Yaping, et al. "Advances of flexible pressure sensors toward artificial intelligence and health care applications." Materials Horizons 2.2 (2015): 140-156.[9]Winter, Jenifer Sunrise, and Elizabeth Davidson. "Governance of artificial intelligence and personal health information." Digital policy, regulation and governance (2019).

Zhao, Yang, et al. "Artificial intelligence-based fault detection and diagnosis methods for building energy systems: Advantages, challenges and the future." Renewable and Sustainable Energy Reviews 109 (2019): 85-101.