

ARTIFICIAL INTELLIGENCE AND FUTURE OF HUMANITY

K.A. SUNDHAR

B.Tech, Computer Science

Email ID: Sundhar.2021.@vitstudent.ac.in

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 Turing-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 have a 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 easily copied 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 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 on a 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 tool that 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.

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