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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.

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