

Oguzkaan Schools

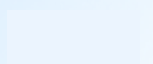
JMUN

Special Committee II



Issue :

Improvement and
Utilization of the Studies on
Artificial Intelligence



Forum: Special Committee II

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I. Introduction

World Technology Conference was established under the UN's body in 2019. It mainly focuses on technological innovations. There are both governments and companies involved in WTC. The conference is not only having studies on upcoming technology but also functioning in the adaptation process of the current technology programmes. WTC (World Technology Conference) requires providing equal technological conditions worldwide. One of its aims is constituting a fund to create a system in order to transport the existing conditions of technology . The advancement of Artificial Intelligence will be taken into consideration at this conference. Many studies have been done on these issues before. Nevertheless, more specified works should be performed in this case. Thus, the World Technology Conference will have the responsibility of administering these ongoing practices and organizing new ones to make humanity benefit from science and technology.

II. Definition of Key Words

Artificial Intelligence : Artificial Intelligence is the simulation of human intelligence processes by machines, computer systems. These processes include learning, reasoning and self –correction.

Weak AI: It is the ability for machines and computer systems to reproduce information and implement simple tasks to solve a specific problem.

Strong AI: It is the ability for machines and computer systems to solve problems by performing tasks in a wide range of fields with an equal or superior level of intelligence of humans. However, its ability to analyze its own reasoning is controversial because it creates the idea of machine "consciousness".

Artificial Neural Network (ANN): A learning model is created to act like a human brain that apply tasks that are too difficult for traditional computer systems to solve.

Chatbots: A chat robot (chatbot for short) is designed to simulate a conversation with human users by communicating through text chats, voice commands, or both.

Cognitive Computing: It is a computerized model that mimics the way the human brain thinks. It involves self-learning through the use of data mining, natural language processing, and pattern recognition.

Algorithms: They are a set of rules or instructions given to an AI, neural network, or other machines to help them to learn on their own. Classification, clustering, recommendation, and regression are four of the most popular types.

Deep Learning: It is a part of machine learning methods based on learning data representations as opposed to task-specific algorithms. The machine collects and analyses a large amount of information that can then be categorized.

Machine Learning: Machine learning refers to machines functioning without being fed with input to perform tasks. It employs the patterns of results obtained in the past to act for current goals.

Analogical Reasoning: As a tool of decision making and problem solving, analogy is used to simplify complex scenarios. This can

improve the quality of solutions as long as the substitution is valid. As a tool of communication, analogies can efficiently represent complex ideas with familiar and easy comparisons.

Supervised Learning: A type of machine learning in which output datasets train the machine to generate the desired algorithms, like a teacher supervising a student.

Turing Test: Conceived by mathematician Alan Turing in the fifties, the Turing Test consists of evaluating a machine's capacity to imitate a human being to the extent that it's indistinguishable from a flesh-and-blood person. The Turing Test is still considered to be the most valid means of judging the level of artificial intelligence attained by a machine.

Deductive Reasoning: Deductive reasoning is a logical process in which a conclusion is based on the outcome of multiple arguments that are generally assumed to be true.

Inductive Reasoning: Inductive reasoning is a logical process in which multiple arguments are combined to obtain a specific conclusion.

Perception: The way in which something is regarded, understood, or interpreted.

III. General Overview

Artificial Intelligence (AI) is the capability of programmed machines or computer-controlled robots that act like a human being without taking advantage of any living organism. Speech recognition, learning, planning and problem solving are the tasks which computers are expected to actualize. Computers have been programmed since the establishment of the digital computers in the 1940s. Since the day, scientists have had studies on artificial intelligence for the sake and future of humanity. AI had great impact not only on a daily basis but

also on industrial area. On that account, AI is used in many fields such as business, health care, transportation and gaming. The companies which have AI in their systems can have durability in their working hours since the machines do not need to have a rest. Also when there is a limit for humans to execute their tasks, artificial intelligence comes in and exceeds limits. In as much as misdiagnosis leads to death, artificial intelligence can be useful in healthcare too.

Even though it is indisputable that using the system of AI is very advantageous, its risks are still questionable. The AI system can be programmed for destruction such as autonomous weapons. There is a group of people who indicate that intelligence is something unique for humans. They assert that the mental and thinking capacities of humans will diminish since dependency on machines will increase. Nevertheless, the machines have the ability to work 24/7, they seem more suitable to be used in the companies. As a result, a large-scale of unemployment can occur. Computers are not able to be creative. Therefore, their tasks will be restricted by what they are programmed to. In addition, some of the companies do not have funds to implement AI system when its costs of installation and maintenance are considered. Though AI is improving day by day, there are still some parts which need to be developed. The humanity should not only increase the number of studies on AI but also decrease the risks and negative outcomes of AI. On the ground of living in the technology era, humans will need AI much more than today. That's the main reason why the improvement of the studies on this area is very crucial for us. If there is an increase in the experiments, it seems possible to overcome its disadvantages.

a) Learning

Machine learning, deep learning, learning by trial and error are different forms of learning as applied to artificial intelligence. Learning by trial and error is the easiest way to programme a computer. For instance, when a machine makes a mistake, it will not be making the same mistake for the second time since it will recall the right one. This is

called rote learning and it is very easy to implement it on a computer. Another way of learning is generalization. Generalization depends on analogical situations. It means if a machine experiences something similar to the current situation before, the machine will manage to respond to the problem.

b) Reasoning

There are two types of reasoning in artificial intelligence: deductive and inductive reasoning. While the consequences are confirmed by premises in deductive reasoning, there is no guarantee for the truth of the conclusion in inductive reasoning. That's why, inductive reasoning is used in science and deductive reasoning is common in mathematics and logic. Reasoning helps AI to have critical information and use deductive statistics.

c) Problem Solving

Many problems were overcome in several areas such as business, finance, health care by using AI's problem-solving feature. There are also two methods for problem-solving: general purpose and special purpose. While special purpose method is used for previously planned actions, the general-purpose method can be used for a variety of different actions.

d) Perception

Perception is the way how we understand or view the objects by our sensory organs both artificially or naturally. Artificial perception is developed to provide optical sensors to the environment. Donald Michie was the figurehead of perception and action. He created a robot with a moving television eye at the University of Edinburgh between 1966-1973. A variety of objects were recognized by the robot called FREDDY and also it was capable of gathering the pieces of some artifacts such as a toy car.

e) Language

A variety of sentences can be formulated by a productive language such as human language other than traffic lights and bird calls. Although it is easy to implement human language to the computers, they never understand the language itself since the language should be learned in order to understand it completely. Therefore, if a system is required to be developed, first a language should be designed for the machine. Python, Prolog, JAVA, and LISP (List Processing) are the most useful languages that scientists have used so far.

IV. Brief History and Background of Artificial intelligence

The first traces of Artificial intelligence were found B.C. Some ideas about creating humanoid robots have been put forward in the Ancient Greek Era. The mythology of the wind has been ruled by *Daedelus* in order to create artificial humans. Defining philosophers' system of human thought was the starting point of modern artificial intelligence system. In 1884, there was an unsuccessful trial by Charles Babbage. After he realized that he was not able to create a computer system which would exhibit intelligent behavior, he suspended his studies. British computer scientist, Alan Turing, and his team put an effort on Enigma which was a code used by German forces in order to provide privacy in a communication system during World War II. Machine learning was established with the help of these studies too. Despite his studies on Enigma, Turing proposed the main question "Can machines think?" and he designed Turing test known as "Computing Machinery and Intelligence". The imitation game, which was comprised of an interrogator, a human and a machine, were also founded by him. Turing wanted to test the computers by making the interrogator have a conversation with a human and a machine. If the interrogator is not able to understand the source of the reply, it means that the machine is successful. Though the machines fail today, this test was very effective in considering the capability of the machines. However, the Dartmouth Conference which was held in 1956 was considered as the first step of

the studies on artificial intelligence. It is known that the term “artificial intelligence” was first used at the conference named Dartmouth Summer Research Project on Artificial Intelligence (DSRP AI) by the leadership of American computer scientist McCarthy and Marvin Minsky. Though the conference lasted shorter than expected, the outcomes of this conference cannot be underestimated since that was the beginning of a new era for artificial intelligence. In the purpose of solving-mathematical problems and theorems, algorithms were developed in the 1960s. Furthermore, during these years computer experts were working on machine vision learning and developing machine learning in robots. In 1972, the first humanoid robot was designed in Japan. Unfortunately, from the mid 1970s to the mid 1990s, the level of the studies were stable and there were no improvements on AI system. These years are also known as “The First AI Winters”. Enormous amount of data was needed in order to create an intelligent robot. However, it was very difficult to provide that amount of data to be successful. The enthusiasm was lost and not only governments but also the companies lost faith in AI during these years. After those years, AI became the focus point of American market once again and new fifth generation computers would be designed by the Japanese government to enhance the machine learning. The faith of humans was refreshed and they were ready to develop the ongoing system. In 1997, Garry Kasparov who was known as chess champion of the world was defeated by IBM's Deep Blue. It was the first computer which succeeded to beat a human being. In the past 15 years, machine learning has been used for huge commercial tasks by Google, Amazon and Baidu and now machine learning is a part of approximately most of the online services.

V. Current Situation

During recent years, humanity has showed a great amount of interest in Artificial Intelligence. By 2017, AI market reached \$8 billion. Big data, faster computers, and improvements in learning techniques were the reasons for this success. The scientists has reached a couple of important human level studies on AI system in the 21st century such as digital

assistant from Google and Amazon, autonomous driving, text translation, image classification and speech recognition. An AI system which could play Atari games was introduced by Deep Mind (the ruling research of AI) in 2013. By 2015, a smarter agent which was able to play forty-nine classic games by itself was enhanced. Notwithstanding the Atari games, the foremost human Go player was defeated by AlphaGO which was created by DeepMind. Besides these products, there are many examples of AI systems in our daily use. Smart replies during communication, chatbots, Google predictive searches, product recommendations, music suggestions, mobile banking, maps and directions, ride-sharing applications are the sights of the efficiency of Artificial Intelligence. We are getting more productive and our daily life is getting easier using AI systems both online or offline.

VI. Conclusion

Artificial Intelligence is the foremost technological innovation which the science world has been trying to provide a high-quality system of machines for decades. The more studies have been done, the more improvement they have got since the term AI was used for the first time in 1956. Since then, it has been predictable that the future of computer science is the system of AI. Though there are several near human level products as aforementioned, there is still no existing super intelligence who is smarter than a human. However, with the help of the governments and companies involved, it seems possible to achieve the intelligence level of a human being by machine learning in the following years. While the governments are trying to keep up with technology trends, they need to make their citizens aware of these programs to make them use AI systems in an efficient way. If humanity wants to have better outcomes, the number of studies on AI should be increased immediately. At this point, World Technology Conference has some responsibilities to encourage more scientists and companies to focus on machine learning system.

VII. Questions that a Resolution Must Address

- Which precautions should be taken in order to cope with the risks of Artificial Intelligence?
- What should be done by governments and involved companies to raise awareness of the society about the studies on AI?
- What will be the fund of upcoming innovations on AI systems?
- Who will be the figureheads of the studies during improvement process?

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