



Lotfi A. Zadeh Phenomenon in the Development of the World Artificial Intelligence (Ai) System

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ABSTRACT

Lotfi A. Zadeh, whose 100th anniversary is celebrated all over the world in 2021, is a genius bestowed by the Azerbaijani people to the scientific world of thought. Lotfi A. Zadeh the only phenomenon was chosen as a lifetime professor for great services in the field of artificial intelligence from the AI Institute. This commentary describes the life and rich scientific activity of the world-renowned Azerbaijani scientist Lotfi A. Zadeh. It is impossible to understand and imagine the methodology of artificial intelligence, which is currently relevant all over the world, without the philosophy of these sciences, including the theories of Lotfi A. Zade. According to Google Scholar, as of February 2021, Lotfi A. Zadeh's work has been cited about 270,000 times in scholarly works, with the 1965 Fuzzy sets paper receiving more than 115,000 citations. The author also sought to evaluate the methodological and practical relationship of Lotfi A. Zadeh's idea and scientific navigation in an interdisciplinary direction.



Introduction

Since the creation of the world, it has been known that the world around us is perceived by thought. Starting from the simplest approach, the world and man, current events are understood through the conclusive results of wise philosophers. Man has managed to get rid of the effects of harsh nature and wild animals by thinking.

From this point of view, the philosophy of world in is largely loaded with its own perceptions, including Artificial Intelligence consciousness. Since the first task of philosophy is to understand the question, the first question is what Artificial Intelligence is. So what is artificial intelligence? According to scientific findings, which is the focus of today's worldview, artificial intelligence is essentially a system of thinking without a living organism - control and management.

If modernism, along with the evolution of the human mind and antiquated feudal thought, destroyed the system and the whole structure and formed the ideas of a secular-modern society, then postmodernism replaced this system with artificial intelligence and continues to evolve.

The field of artificial intelligence is large and full. While the replacement of the human mind with Artificial Intelligence had started with computer engineering, this process was sometimes enriched with both new intelligent computer stages and more sophisticated robot technology. It is no coincidence that all attention is focused on the complete victory of Artificial Intelligence in the world, which is now described as a stage of globalization.

From simple smart machines to computers with enormous capabilities, Artificial Intelligence has risen to the level of progress in robotics with a powerful postmodernist leap in science. As a matter of fact, the issue on everyone's mind at the moment is that the world is surrendering to the power of Artificial Intelligence and leaving its place to human beings. Millions of control events, from smart computers to smart cities, quickly make their own history as they move towards the future. It should be noted that the Artificial Intelligence analogy, like all dialectical, metaphysical, and spiritual phenomena, also dates back to antiquity.

Not only is the invention of electronic engineering, electronic computers, computers or robots, but also the existence of Artificial Intelligence in front of simple mechanical large and complex machines, and human intelligence in general, is of interest to modern Artificial Intelligence.

Of course there are thinkers behind every scientific discovery. Its long-term research, based on serious theoretical and methodological research, provides the world with new discoveries and discoveries. At the same time, when these discoveries are of paramount importance to human activity or the intellectual revolution, it becomes a system and applies to the experience of the whole world.

Therefore, there is a scientist who is the creator of the Artificial Intelligence System, like other scientific systems. The generation of scientists who developed and continued to enrich it is also known. There is no doubt among them the world famous Azerbaijani scientist Lotfi A. Zadeh and it is irreplaceable.

Main Part

First of all, the strength and energy of human creation is characteristic, regardless of the field of science. From time to time, scientists conquered the universe, earth, oceans and deep seas, making countless inventions with their creative powers. Such Artificial Intelligence is also a product of the human mind. However, this latest discovery by scientists overshadows or completely destroys all human thought mixed with their energy and knowledge. Artificial Intelligence scientists have concluded that machines could replace a man who had been "intelligently" tested by the AI creature masses.

Thus, artificial intelligence scientists, considered one of the most important objects of the multidisciplinary system that forms the basis of modern science, are considered important in the process of understanding the world in the context of mathematics, logic, physiology, neurophysiology, psychology, cognition, epistemology, philosophy and many other theoretical disciplines. Studies have shown that machines can replace HUMANS.

Based on this, we can say that A. Turing gave the world thinking the methodology of "smart" computers in the face of millions of human questions, which realized the revolutionary progress of this new civilization, as well as the collapse of modernism based on the enormous potential of the human mind and practice.

Historical sources in all fields lead researchers to myths and ancient Greek philosophy. First of all, it should be noted that the traces of artificial intelligence in myths not only determine the history of the phenomenon, but also expand its field of interdisciplinary research with the sciences of mythology, anthropology, ethnography, ethno genesis.

Thus, the first (dog) robot created by Zeus, called the bronze-winged Talos, one of the ancient Greek myths, can be considered the "father" of modern artificial intelligence robots. One of the main features of Tolos is explained by the placement of a tube in the "body" of this humanoid robot, which resembles a vessel through which molten steel flows from the shoulder to the toe. Tolos, like modern electronic robots, had features such as sharp speed and stone-throwing to replace humans. Thus, according to the sources,

"Talos is a bronze mythical giant, the first robot in history to protect Minoan Griti from invasions"¹.

An interesting issue here is that the myths and legends of the ancient world created a rich library of science fiction and non-fiction works in the history of artificial intelligence. Similarly, in these works, artificial intelligence includes the past and future of the world .

Karel Chapek's "Intelligent Universal Robots," E. Van Vogt's "The World of the Moment," Arthur C. Clarke's "The City and the Stars," "Press the Button for Frankenstein," Robert A. Heinlein's "The Moon is a Tough Mistress," and Dan Simmons's Hyperion Songs ", " Angels and Spaceships ", " I am a robot ", " Two-year-old ", " Cyber ", " 2001: Space Odyssey "and many other works attract attention as an onology of artificial intelligence.

In these works, the fantastic transformation of the computer into a human being actually predicted that in the future, intelligent machines would replace human activity.

Like myths, the written literary and philosophical works of antiquity had similar definitions that confirmed the existence and possibility of artificial intelligence. However, it originated in the first decade of the seventeenth century, and in the twenties of the nineteenth century it spread throughout the world. It was included in the stage of development of the mind, progress, national cultures, and even as an educator. During the Holocaust, especially in Europe, which was considered the cradle of enlightenment, there was a serious scientific interest in the fields of artificial intelligence, and R. Descartes, T. Hobbes, Blaise Pascal and Leibniz, more later Charles Babbage and Ada Lovelace, Bertrand Russell and Whitehead, Conrad Tsuze, Warren McCullough and Walter Pitts, and others enriched the field with valuable scientific innovations.

Although the research of these scientists was based on the analysis of mechanical materialism in humans, as well as in living organisms in general, they revealed the possibilities of the intellect, and provided practical and practical examples of this.

In this regard, the beginning of the generation of super digital computers, which are widely used in artificial intelligence, is considered to be the beginning of the development of gradual development, analog systems such as nomogram, slide rule, astrolabe, oscilloscope, television, analog sound processor, autopilot, as well as abacus. Therefore, the analogous field of artificial intelligence is strong and wide, as well as sustainable.

Of course, the system of artificial intelligence, which is deeply rooted in world science today and is widely used, opened the way to world thinking from England, and now the United Kingdom ranks first in Europe in terms of AI development. Thus, in 1936, at the age of 24, Alan Turing, an English mathematician and logician known for his unique contribution to the development of computer science, introduced the new idea of the Turing machine, the so-called "father" of modern universal computers.

The 1940s are notable for A. Turing's scientific activity, and therefore in the development of the artificial intelligence system. In 1950, this unique genius substantiated and put into practice the idea of artificial intelligence in "Computing Techniques and Intelligence" and the famous "Turing Test".

Alan Turing made great historical achievements in the field of science in 1950-1952, creating an artificial intelligence system that will benefit us and future generations. However, no matter how interesting and useful the life of the great scientist, he died mysteriously in 1954, at the age of 42.

The works of the great scientist were published in bulk 40 years after his death, and for 28 years the world has been widely benefiting from A. Turing's artificial intelligence system, and the generation of scientists advancing along his path is developing science and practice with their innovations.

¹ Талос - бронзовый мифический великан. <https://www.grekomania.ru/articles/114-talos>

The term of artificial intelligence, which originated from Turing machines or Turing tests, was introduced to the literature in 1956 by John McCarthy (John McCarthy), an American computer scientist, winner of the Turing Prize for great services in the field of AI (1971).

In the People's Republic of China, one of the three largest countries in the world in East Asia, the field of artificial intelligence continues to develop with great success.

Canada, India, Israel, France, Germany, Sweden and Spain are in the top 10 in terms of artificial intelligence.

Of course, the United States is one of the top three countries in the world that embraces and uses the field of artificial intelligence, which is considered the father of Thuringia. In fact, the role of artificial intelligence in the economic and military development of the United States is enormous. One of the scientists who enriched the periodical history of new navigation in modern societies with his successful discoveries in assessing the progressive development of SI in the United States is Lutvi Rahim oglu Askarzadeh, the only person of Azerbaijani origin who was elected a lifelong professor of artificial intelligence.

Lotfi A. Zadeh, who is celebrating the 100th anniversary of world science this year, was born in 1921 in the village of Novkhani in Baku, the capital of Azerbaijan. His father was originally from an Iranian-Azerbaijani intellectual family, and at the same time he studied at the Faculty of Oriental Studies of the Azerbaijan University and even worked as a Baku correspondent for Iranian newspapers.

Lotfi A. Zadeh's father, Rahim Alasgarzadeh, and his mother, a Baku Jew who was a doctor by profession, thought that he should receive a serious education and that Lutfizadeh received a perfect education in the Russian department.

Alasgarzadeh's family returned to Tehran, Iran in 1931 - 11 years after the establishment of the Soviet government in Azerbaijan. The reason for this was, of course, that they did not accept the law of acquiring Azerbaijani citizenship, like Iranian citizens who moved to Baku during the First World War.

Lotfi A. Zadeh was 9 years old at the time of this migration, and after moving to Tehran, his parents placed him in the Albors School for Americans living in Iran. The Albors school gave Lotfi A. Zadeh a deep interest in America and gave him a great impetus to think about his life in this country. Thus, after completing his compulsory education and entering the Faculty of Electrical Engineering at Tehran University, after graduating from this university in 1944, he went to the United States and received additional training at the Massachusetts Institute of Technology. The scientist himself shared his thoughts on this: "In Iran, I was deeply influenced by the decency of these American missionaries who ran the school which I attended. It's the sort of decency that one finds in the US if you go to the Midwest or rural areas-away from the big cities. To me, these people were role models-so willing to help others who were not of the same ethnic origin. They weren't nationalistic. They had a mission and they stuck to it. That influenced me deeply"².

The world-famous Lotfi A. Zadeh, whose 100th anniversary is being celebrated, started working at Columbia University in 1947. The University of California, Berkeley played a major role in the life and work of Lotfi A. Zadeh, an Azerbaijani who received a master's degree in electronic engineering from Columbia University in 1948 and a professorship in 1957. Lotfi A. Zadeh, who came to this famous university on the recommendation of the famous cybernetics scientist Norbert Wiener, worked at the University of Berkeley for the rest of his life, despite the great difficulties he faced.

² Interview with Lotfi Zadeh Creator of Fuzzy Logic [http:// www. azer. com/ aiweb/ categories/ magazine /24_ folder/ 24_ articles/24_ fuzzylogic.html](http://www.azer.com/aiweb/categories/magazine/24_folder/24_articles/24_fuzzylogic.html)

Famous Azerbaijani scientist Lotfi A. Zadeh is named after Harry Nyquist, the world's first scientist in television communications, Richard Belman, a scientist in dynamic programs and computer technology, Rudolf Kalman, one of the founders of control theory, and Carl Astrom in the field of theory and energy control. Lotfi A. Zadeh is the winner of the most prestigious Honda and Okawa awards. He was awarded the highest awards of such well-known organizations as Gregor Moisil, Rudolf Olden burger, Richard W. Hamming, and Kempe de Feriye. Lotfi A. Zadeh is also a member of the US National Academy of Engineering, the Russian Academy of Natural Sciences, and an honorary academician of the Azerbaijan National Academy of Sciences.

In addition, in 2016, Japanese scientists developed the first robot with artificial intelligence based on the theory of Lotfi A. Zadeh . This robot named Alter is on display at the International Science Museum in Tokyo.

The world-famous scientist Lotfi A. Zadeh said in an interview: “You may not know anything about Lotfi A. Zadeh and his fuzzy logic theory for the rest of your life. But if you have at least modern cars in your house, my thoughts and I are always and invisibly with you. For example, if you bought an air conditioner from Hitachi, Sharp, know that it is thanks to this theory that the levels of temperature change are maintained. If the same companies sell you a microwave oven, know that the right cooking strategy is provided by fuzzy logic theory. If you come across a Canon photocopier, a Matsushita dishwasher or dryer, or a Daewoo or Samsung washing machine, or a Sony TV, or a computer, know that all of these technologies are to some extent born of Lotfi A. Zadeh's fuzzy set theory”³.

Thus, since the middle of the last century, he has made his most famous historical scientific discovery, the theory of fuzzy logic, which has been quickly confirmed in reality by shaking the fuzzy logic of history and is being applied in science as well as in industry.

The world's superpowers, such as the United States and Japan, have widely used the theory of Azerbaijani scientist Lotfi A. Zadeh, based on the concept of modern fuzzy logic, in the rich industries of their countries.

Thus, the world science, which is experiencing the highest stage of scientific progress compared to previous periods, also substantiates the understanding and application of the artificial intelligence system with the great discoveries of the prominent scientist Lotfi A. Zade. Thoughts about the benefits of artificial intelligence are based on more realistic principles. Whether it is the understanding and use of the universe, the application of global satellite navigation systems, the development of interplanetary technologies, electronic devices, etc. In general, the field of artificial intelligence confirms the great scientific achievements of the time.

In an interview, the great scientist answered the question, "Would you say that Fuzzy Logic turns Aristotelian or Classical Logic on its head?"

“(Laughs). Back in Aristotle's day, people tried to be as precise as possible. That's the Aristotelian tradition, the Cartesian tradition. Looking at things as being entirely black or white stems from such a tradition. But take the example of good and bad. What we're beginning to understand now is that sometimes things that we perceive as bad really turn out to be good, or perhaps, not as bad as we originally thought. Things can serve a purpose. People back in Aristotle's time and even later thought that by perceiving things in black and white (in absolute terms) that they gained alot. And they did. But they lost a great deal in the process. Fuzzy Logic represents a swing in the opposite direction but I would like to stress that there is much more to Fuzzy Logic than multi-valuedness of truth”⁴.

³ Fuzzy Logic Лютфи Заде <https://vestikavkaza.ru/articles/Fuzzy-Logic-Lyutfi-Zade.html>

⁴ Interview with Lotfi Zadeh Creator of Fuzzy Logic http://www.azer.com/aiweb/categories/magazine/24_

In the continuation of his interview, he explains his theory with a simple example for all people: "Many people don't realize that this is one of the very important features of Fuzzy Logic. You use what I call "granulation" which means you lump things together. It makes things easier, cheaper and faster. If you had a bunch of screws and nuts and you picked up one screw at a time and took it some place and then came back for another, it would take a long time. Dump them together in a bag and it's faster. That's what you do with FuzzyLogic"⁵.

Lotfi A. Zadeh's discoveries as the basis of AI in many complex areas of globalization - "Hitachi", "Matsushita", "Sharp", "Nissan", "Canon", "Fuji", "Electric", "Toshiba", Omron, Sanyo, Sony Trinitron, Daewoo, Samsung, Nec, Honda, as well as the American aerospace industry, General Motors, General Electric, Motorola Well-known brands such as DuPont, Kodak have formed the basis of sustainable development of world companies, and this achievement continues.

Our compatriot Lotfi A. Zadeh, a genius of science who conquered the peak of scientific achievements of the stage of globalization, also left his mark on history by updating mathematics, which is considered a scientific science. This theory of Lotfi A. Zadeh is also considered a revolution in science due to its essence and value. Because the "mother tongue" of the sciences, the renewal of mathematics, or more precisely, the duplication, and the considerable narrowing of its scope, have realized the need for a revolution in other sciences as well. However, the exact sciences, such as physics, chemistry, and the natural sciences, naturally changed their criteria in the face of this genius.

The science giant of the new era, Lotfi A. Zadeh, has enriched the scientific achievements of the lived and written history with a new global scientific theory that will attract the world - double uncertainty navigation. Lotfi A. Zadeh, who replaced fluent logic with fuzzy logic, proposed a project to combine the theory of probability, which is at the root of fuzzy, with it. This theory has been validated and is valued as a re-creative approach to an event that has been unsuccessful in many experiments throughout history.

Like other theories of Lotfi A. Zadeh, a leading expert on NASA and NATO, the application of this theory to both industry and the humanities can be expected to show the way out of the global threats facing mankind by influencing the fate of both material and spiritual values.

The Result

There is a saying that a healthy body has a healthy mind. Lotfi A. Zadeh was a man of deep thought and wisdom. Thoughts were useful as "light" to the world and the world didn't want to lose him. It is no coincidence that the world-famous scientist lived for 96 years. Most importantly, he thought, wrote and CREATED until the end of his life.

It is also very interesting to learn the character of genius like Lotfi A.Zadeh. Loyalty and trust are the most important aspects of human nature. We see this clearly in Lotfi A. Zadeh's philosophy of life. For example, the great scientist was born in Azerbaijan. He but did not forget this country for the rest of his life. He fell in love and dreamed of his last apartment in Baku, where he was born. His will was accepted with great pleasure, and after the death of the world's rare scientist in 2017, he was buried in the Alley of Honors in Baku.

Lotfi A. Zadeh had the most beautiful feature that a real person should have. His character was stable. Here is an address in his biography, he worked continuously for 60 years at the University of

folder/ 24_articles/24_fuzzylogic.html

⁵ Again there

California, Berkeley. He experienced his greatest difficulties and highest achievements here.

Lotfi A. Zadeh remained loyal to his homeland, profession, place of work, family and friends throughout his life.

Lotfi A. Zadeh loved the world, people and for him the nation, religion, language. In an interview with Lotfi A. Zadeh, a Turkish scholar who is proud of his Turkish character, journalist Betty Blair said, "Lotfi A. Zadeh has stood aside from nationalism, insisting that there are deeper issues in life, and explained: He's quick to shrug off nationalism, insisting there are much deeper issues in life. "The question really isn't whether I'm American, Russian, Iranian, Azerbaijani, or anything else," he'll tell you. "I've been shaped by all these people and cultures and I feel quite comfortable among all of them"⁶.

Thus, it is impossible to understand and imagine the methodology of artificial intelligence, which is currently relevant all over the world, without the philosophy of these sciences, including the theories of Lutfizade. One of the main tasks of modern world scientific thought is to expand the field of scientific multidisciplinary theoretical and practical research of artificial intelligence, especially philosophy, by substantiating Lutfizadeh's methodologies in practice.

According to Google Scholar, as of February 2021, Zadeh's work has been cited about 270,000 times in scholarly works, with the 1965 Fuzzy sets paper receiving more than 115,000 citations⁷. This, of course, confirms the role of the world-famous Lotfi A. Zadeh of Azerbaijani origin in the development of the Artificial Intelligence system.

Of course, Lotfi A. Zadeh, whose 100th anniversary is celebrated all over the world this year, is an invaluable science-intellectual phenomenon.

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⁶ Lotfi Zadeh Short Biographical Sketch http://www.azer.com/aiweb/categories/magazine/24_folder/24_articles/24_zadeh.html

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