

# Artificial intelligence is the key to success in practical application

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**Abstract** – Artificial intelligence technology is rapidly advancing year by year, and thus the possibilities of using artificial intelligence in every branch of science. The importance of artificial intelligence and its components has been known for a long time. They are seen as tools and techniques that make the world a better place. With their simple and everyday techniques, they make the world a mistake-free place. These technologies and applications are not only related to our general and everyday life, but also affect and have significance for other domains as well. The paper will analyze the application of artificial intelligence and its influence today.

**Keywords** – artificial intelligence, technology, science, education, machine learning

**Apstrakt** – Tehnologija vještačke inteligencije iz godine u godinu ubrzano napreduje, a time i mogućnosti korišćenja vještačke inteligencije u svakoj grani nauke. Značaj vještačke inteligencije i njenih komponenti odavno je poznat. Na njih se gleda kao na alate i tehnike koje čine svijet boljim mjestom. Svojim jednostavnim i svakodnevnim tehnikama čine svijet mjestom bez grešaka. Ove tehnologije i aplikacije nisu samo vezane za naš opšti i svakodnevni život, već utiču i imaju značaj i za druge domene. U radu će se analizirati primjena vještačke inteligencije i njen uticaj danas.

**Ključne riječi** – umjetna inteligencija, tehnologija, nauka, obrazovanje, mašinsko učenje

## I. INTRODUCTION

The popularity of artificial intelligence (AI) is growing every day.

Artificial intelligence is the ability of a system or application to think and learn. Artificial intelligence applications have advanced significantly in the last few years and have found their application in almost all sectors. The work is based on the analysis of secondary data sources, that is, on relevant scientific and professional articles and other publications that deal with the issue of artificial intelligence applications today.

## II. METHODS OF ARTIFICIAL INTELLIGENCE DEVELOPMENT

Artificial intelligence is a set of theories used to implement applications that can simulate intelligence in different contexts. It is a complex information processing system capable of learning from examples or experiences, transferring knowledge, and replicating human problem-solving.

Over the past 60 years of development, many useful applications of artificial intelligence have emerged, but its capabilities have not always fulfilled ambitious promises.

We are currently living in a period where artificial intelligence has many applications, more significant than ever in history. [1]

## III. HISTORY OF ARTIFICIAL INTELLIGENCE

Who could know that something that was thought to be coming for hundreds of years is starting to keep pace with the history of human beings? [2] Although the concept of artificial intelligence became popular only in this century, its concept was created in the 50s of the last century.

The term "Artificial Intelligence" was first used in 1956, at a time when the engine of artificial intelligence was about to stumble, at the congress held at Dartmouth College, which brought together the first experts and scientists, who began to systematically deal with research and issues of artificial intelligence in general. This term was first coined by three scientists: John McCarthy, Marvin Minsky, and Claude Shannon, and defined as "The science and ingenuity of creating intelligent machines". [3]

But although artificial intelligence is considered the idea of a new age, some beginnings of that concept can be found in ancient myths, such as the myth of the Golem, and in other literature that goes back far into human history.

The first computer program considered to be based on the concept of artificial intelligence is "The Logic Theorist" from 1955. [4]

## IV. ARTIFICIAL INTELLIGENCE TODAY

Before explaining today's methods of applying artificial intelligence, a modern visualization of artificial intelligence should be presented. Artificial intelligence is found in objects we use every day, such as voice dictation, searches with browser assistants, or fraud detection.

Artificial intelligence (AI), especially the subfields of machine learning (ML) and deep learning (DL), has moved from prototyping in research institutes and universities to industrial and practical applications within a decade. Artificial intelligence has changed the way we live and work because today we can use it to perform tasks in a simpler and faster way.

## A) Machine learning

Machine learning is an artificial intelligence module in which people train machines so that they can recognize patterns in data and make assumptions.

Machine learning is the alpha and omega of artificial intelligence, that is, the machine that uses it makes it smarter. [5]

In ways, the machine has the ability and "knowledge" to "figure out" things on its own and come up with an answer without having to be programmed for it. Data-intensive applications of machine learning methods can be found throughout science, technology, and commerce, leading to evidence-based decision-making in many walks of life, such as healthcare, manufacturing, education, finance, law enforcement, and marketing. [6]

## B) Deep learning

Deep learning is a machine learning module within which each machine can train or learn itself. Since 2008, deep learning has become and remains the best thing about artificial intelligence. The easiest way to define deep learning is if it is viewed as a prism of neural networks within which data is processed in a way similar to how the human brain does it.

The main difference is that one does not need to "deeply" learn what a car is and what it looks like. All that is needed is to give a sufficient number of pictures of the car and he will understand what the car is and what it looks like. Companies that have started implementing deep learning are Facebook and Amazon.

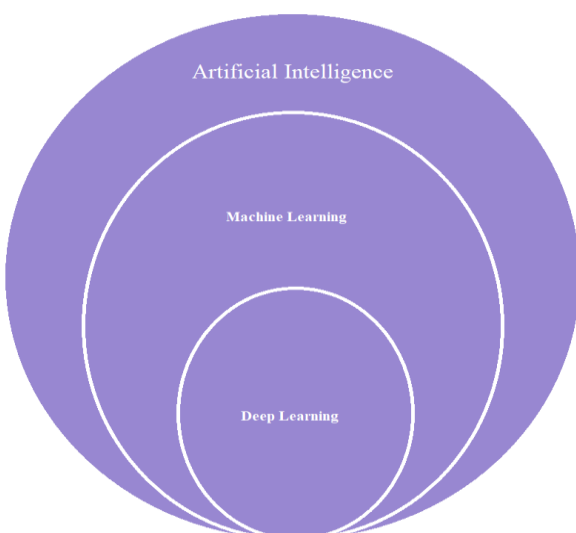


Fig. 1. Visualization of a modern model of artificial intelligence [3]

## V. ARTIFICIAL INTELLIGENCE IN EVERYDAY APPLICATION

Artificial intelligence is increasingly involved in everyday life. Efforts being made to build artificial intelligence have experienced a huge rise in recent years. At the same time, huge funds are invested in the application and development of intelligent systems in various areas, including communication, trade, healthcare, internet search, and production processes. [7]

Some of the most common fields of application of artificial intelligence today are [8] :

- **Application of artificial intelligence in E-Commerce**

E-commerce is a new economic activity that has emerged as a result of network and communication technology. It is the basic concept of the development business process which is based on information technology.

Artificial intelligence technology can be used to create recommendation mechanisms that better communicate with clients. When shopping online, virtual shopping assistants and chatbots help. Some of the problems in e-commerce are credit card fraud and fake reviews. Artificial intelligence reduces the possibility of such fraud and helps in solving fake reviews. [9]

- **Applications Of Artificial Intelligence in Education**

Artificial intelligence increases the efficiency of the teaching process, personalizes teaching, automates many technical tasks, and thus makes it easier for professors and students to devote their time to transmitting and receiving knowledge.

In schools where AI is used in teaching, great results have been recorded. It helps in more accurate and objective assessment, effective testing, better acquisition of knowledge, student motivation, and personalization of learning. These tools and algorithms make education modern, efficient and reusable in the future. [10]

- **Applications of Artificial Intelligence in Lifestyle**

Artificial intelligence has a great impact on our lifestyle. For example, Email used in everyday life has artificial intelligence that filters spam and sends it to spam or junk folders, allowing people to see only filtered content. A popular email provider, Gmail, has managed to achieve a filtration capacity of approximately 99.9%.

Everyone uses devices such as phones, laptops, and computers, and these devices use facial recognition techniques using facial filters for detection and identification to ensure secure access. Apart from personal use, facial recognition is a widespread

application of artificial intelligence even in high-security areas in several industries. Also, a recommendation system to obtain user data and provide customized recommendations to users to increase engagement is a very widely used application of artificial intelligence in almost all industries. [11]

- **Applications of Artificial intelligence in traffic**

Traffic "smart" systems collect and analyze traffic data, search for solutions and apply them to traffic infrastructure. Currently, traffic "smart" systems provide cities with the power to improve traffic monitoring and transportation data analytics. Reliable and stable "smart" traffic could be able to fully autonomously control traffic flow. [12]

In addition to traffic systems, "smart" vehicles are increasingly being used that, with the help of sensors, predict and assume their path in real-time. [13]

Computer vision is a field of artificial intelligence, an interdisciplinary science whose main goal is to enable computers to recognize the elements shown in a digital image or video at the required level and then automate the process in the context of a given task. Computer vision applies machine learning to recognize patterns for image interpretation.

Computer vision is an indispensable technology in the development of autonomous vehicles. It can be used for the automatic recognition of vehicles, traffic signs, and pedestrians. Figure 2 shows an example of the use of computer vision and the OpenCV library in recognizing pedestrians and cars in traffic. [14]

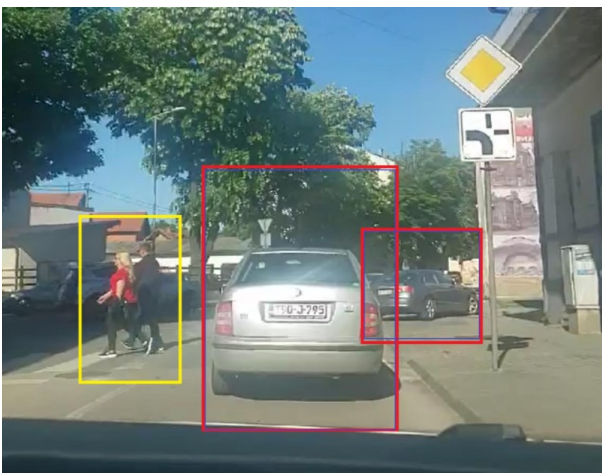


Fig. 2. Pedestrian and car recognition using computer vision and OpenCV library [20]

- **Applications of Artificial Intelligence in Robotics**

Robotics is another area where artificial intelligence applications are used. AI-powered robots use real-time updates to sense obstacles in their path and plan ahead where to go.

- **Applications of Artificial Intelligence in Gaming**

Artificial intelligence applications have found a prominent role in the gaming sector as well. It can also be used to predict human behavior by which game design and playtesting can be improved. [15]

- **Applications of Artificial Intelligence in Social Media**

Artificial intelligence finds its application in social networks as well. Such as Instagram, Facebook, and Twitter. Google also introduced new machine learning algorithms, which create content that targets specific user requests.

- **Applications of Artificial Intelligence in Marketing**

Artificial intelligence applications are also popular in marketing. Using artificial intelligence, marketers can deliver highly targeted and personalized ads with the help of behavioral analysis, pattern recognition, etc. It also helps in retargeting the audience at the right time to ensure much better results and reduced feelings of mistrust.

- **Applications of Artificial Intelligence in Healthcare**

Artificial intelligence has made a great impact on the medical industry. It finds various applications in the health sector. Artificial intelligence applications are used in healthcare to build machines that can detect diseases and identify cancer cells. It can help detect early diagnoses using medical data and help find new drugs. [17]

- **Applications of Artificial Intelligence in Agriculture**

Artificial intelligence can be used in building a sustainable food system. Robots can help with weeding. With the help of drones, it is possible to monitor the development of plants, whether there are diseases and at what stage they are, and whether the fruit is ready for picking. By crossing data from sensors (eg soil moisture), meteorological stations (weather forecasts for macro and micro areas), about available water reserves, etc. AI manages the operation of the irrigation system (water and top-up) via IoT, whereby the entire system does not have to be activated, but only parts. Many agricultural farms in the EU already use artificial intelligence to

monitor the movement, temperature, and consumption of animal feed. [18]

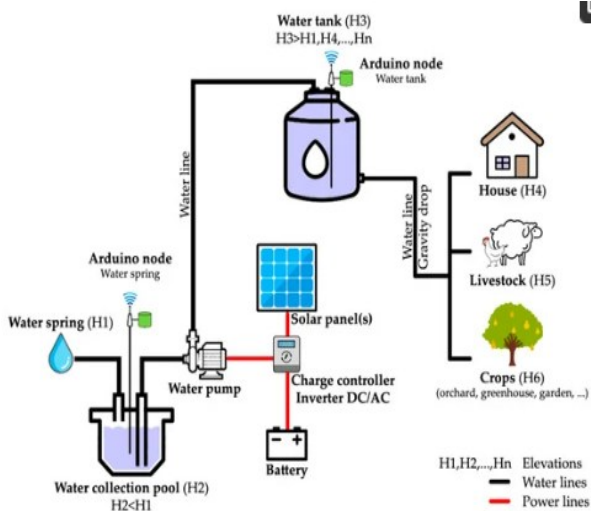


Fig. 3. Autonomous wireless water management system in the mountainous homestead [19]

In this case, in Figure 3, the collected water is pumped into the reservoir located at the highest point of the system (H3), and then it is transported to the buildings by gravity fall. This prevents the pump from running dry and prevents unnecessary cycling if the upper tank is full or the battery does not have enough power to power the cycle. [19]

- **Artificial Intelligence in Cybersecurity**

Cybersecurity is the discipline that could benefit the most from the introduction of artificial intelligence (AI). Artificial intelligence techniques can improve the performance of security systems and provide better protection against an increasing number of sophisticated cyber threats. [20]

In the long-term analysis, development, and application of AI approaches in cybersecurity, a distinction must be made between near-term and long-term goals. Multiple AI approaches can be directly applied to cybersecurity, and current cybersecurity problems require many smarter solutions than those implemented today. [21]

- **Applications of Artificial intelligence in military**

In a military context, the potential for AI is present in all domains (land, sea, air, space, and information) and all levels of warfare (political, strategic, operational, and tactical). We can use AI to improve military capabilities, for example for Surveillance and Underwater mine warfare. [22]

## VI. POSITIVE AND NEGATIVE SIDES OF ARTIFICIAL INTELLIGENCE

Everything has its positive and negative sides, including artificial intelligence. There are numerous positive sides and areas of application of artificial intelligence. Today, almost everyone uses personal assistants, such as Cortana (Microsoft), Siri (Apple), or Alexa (Amazon), and they are an example of artificial intelligence where the computer has contact with people and provides feedback.

As for the positive sides and the improvement of life itself through the application of artificial intelligence, we see progress in the medical industry. [23]

One of the most famous examples of the application of artificial intelligence is autonomous vehicles. Thanks to artificial intelligence, the car can reach its destination independently, predicting dangers, obstacles, and distance. Because of this, the number of traffic accidents will be reduced. [24]

In addition to the positives, Artificial Intelligence also has negatives. Some of the potential problems that can occur when working with artificial intelligence are loss of control, system failure, insecurity, and violation of the law. Although automated driving is predicted to reduce the number of traffic accidents, such vehicles have not yet been declared safe to drive.

Artificial intelligence enables the development of robots that will be able to replace humans. These can be simple tasks such as the automation of fruit picking in agriculture due to the ever-present lack of labor, but above all in life-threatening places such as nuclear reactors, and chemical and process industries. A lot of them are already applied in factories, which led to a certain number of layoffs.

Chatbots answer the most common questions that users ask in call centers, banks, and Web stores, thus losing interpersonal communication. Some of the jobs that could be replaced by artificial intelligence in the future are teachers, security guards, pilots, pharmacists, cleaners, and car and train drivers. [25]

The negative side is that a system managed by artificial intelligence can collect and analyze data about a person's behavior, movement, and habits, which brings into focus questions from a legal aspect such as injury or privacy protection. There is a high chance that machines will use this information against humans.

Bots collect personal information and preferences of people through various channels and thus can extract confidential personal data that can later be used to manipulate the client.

One example of data collection is through social media a network where algorithms track user actions and the content they track. [26]

## VII. CONCLUSION

Artificial intelligence helps solve complex problems for people today with its applications. Soon, artificial intelligence, together with deep learning and machine learning, will rule the world more and more. To what exact extent a machine can replace a human being, time will tell. Although it has much more significance and importance than what is written in this paper, it will continue to develop in the future.

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