

ARTIFICIAL INTELLIGENCE - ADVANTAGES, RISKS AND POSSIBLE THREATS

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Abstract: *The author considers that the subject of this article can be of interest to IT&C specialists from all states and private entities, as well as (and especially) to the Romanian Armed Forces. A focus on the field of Artificial Intelligence (AI) would also be beneficial for the Romanian governors, as a basis for the foundation of future development policies in several areas of economic, education, health, defence sectors, etc.*

Anyone can access various sources of information on the field of AI by using an applied Google search, where one can find dozens of book titles and articles on the subject matter, documents designed by renowned specialists from around the world. A major difficulty is the multiplicity of sources of information, which could discourage those interested due to lack of time, given the current tasks they have to deal with.

The article is only intended to open up the interest in a field with explosive development in the last few years and with complex predictions about the advantages of AI, some risks and possible threats, all of which being currently on the agenda of politicians, specialists and technology companies all over the world.

Keywords: *Artificial intelligence (AI), possible fields of activity, possible risks and threats, use of AI in the military field.*

1.A Brief History of Artificial Intelligence (AI)¹

The concept of Artificial Intelligence (AI) dates back to 1950, when computer scientist Alan Turing published his paper “**Computing Machinery and Intelligence**”, which proposed a test to determine whether machines are capable of thinking like humans. This work laid the groundwork for AI research for years to come.

Artificial Intelligence has come a long way since its conception in 1956. From early applications in robotics to modern AI-powered virtual assistants, AI technology continues to shape and evolve the way humans interact with the world around them.

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¹ „O scurtă istorie a inteligenței artificiale”, available at: <https://tengen.ai/ro/o-scurta-istorie-a-inteligenței-artificiale/>, accessed on 25.11.2023.

The early days of AI, 1950s-1980s:

- **In 1956**, a group of scientists and engineers gathered at **Dartmouth College** (USA) for a research project on “**Artificial Intelligence**”. This event marked the beginning of AI, which was initially focused on developing computers that could think like humans, solve problems with logical reasoning, and have natural language processing capabilities. This program led to many advances over the next decade, including natural language processing, computer vision, robotics, machine learning, and more.

- **During this period**, several early versions of Artificial Intelligence were developed, such as ELIZA (1966) - a computer program designed to simulate conversations with human users; SHRDLU (1977) - a natural language interface for robots; MYCIN (1974) - an expert system for the diagnosis of infectious diseases. However, these projects did not progress beyond basic applications due to limited computing power at the time.

AI becomes mainstream in the 1980s-2000s

Looking at the history of Artificial Intelligence, since 1980 there has been an increased focus on applying AI technologies to real-world applications. Advances in hardware technology have enabled more powerful computers capable of handling large amounts of data efficiently and accurately.

This has allowed researchers to develop more sophisticated systems such as expert systems, neural networks and language recognition software. Many commercial applications of artificial intelligence were introduced during this period, including facial recognition applications for security purposes; automated financial advisors; medical diagnostic systems; industrial robots; **Chatbot** for customer service and automated orders at retail stores.

AI today and in the future

Recent AI technology is much more powerful than ever due to advances in machine learning algorithms and increased access to large data sets for training purposes. Consequently, there are many new applications, from image recognition software used by social media platforms like **Facebook** or **Instagram**, to autonomous vehicles that use artificial vision for navigation.

Virtual personal assistants, such as **Amazon Alexa** or **Google Home**, used to automate mundane tasks; facial recognition systems used by law enforcement agencies; health care robots that can diagnose diseases without human intervention; predictive analytics tools used by companies to forecast demand or predict customer behaviour patterns; machine translation services that can instantly translate text from one language to another;

online shopping bots that help customers find the best products at the lowest prices.

Looking ahead, we can expect these technologies to continue to improve further, using deep learning techniques applied to various fields, including healthcare, marketing, finance, government, education, defence, etc., as well as systems that can detect the increasing fraud or cybercrime.

In conclusion: As technology continues to advance, so does Artificial Intelligence. It is expected that AI will soon become even more integrated into our daily lives, with advances such as sophisticated robots that can perform everyday tasks. Additionally, there will be increased use of machine learning algorithms in data analysis, which will help companies make better decisions based on their data sets. Finally, with advances in natural language processing technologies, it is expected that soon computers will be able to understand us better than ever before, allowing us to communicate more effectively with our digital devices and appliances like never before.

2. What is artificial intelligence and how is it used?²

- AI is now considered to be “*a technology of the future*”.
- To the question “*what is artificial intelligence?*” the specialists in the field of the European Union consider, with solid arguments, that:
 - AI is the ability of a machine to imitate human functions such as reasoning, learning, planning and creativity;
 - AI allows technical systems to perceive the environment in which they operate, to process this perception and to solve problems, acting to achieve a certain goal. Thus, the computer receives the data (already prepared or collected through its own sensors, such as a video camera, etc.), processes it and that reacts;
 - AI systems are capable of adapting their behaviour to a certain extent, analysing the effects of previous actions and operating autonomously.
- **Why is AI important?**
 - Some AI technologies have been around for over 50 years, as we showed in section 1, but the spectacular increase in computing power, the availability of enormous amounts of data and new

² „Ce este inteligența artificială și cum este utilizată?”, available at: <https://www.europarl.europa.eu/news/ro/headlines/society/20200827STO85804/ce-este-inteligenta-artificiala-si-cum-este-utilizata>, accessed on 26.11.2023.

algorithms have led to major advances in this field in recent years;

- Artificial intelligence is considered a central element of the digital transformation of society and has become a priority for the European Union.

- **Types of AI (European Commission definition)**

- **Software:** virtual assistants, image analysis software, search engines, voice and facial recognition systems. Nowadays, AI is incorporated into multi-purpose robots, autonomous cars, drones, the Internet of Things, etc.

- **Artificial Intelligence in everyday life.** Here are some features we use without always realizing they are AI applications:

- **Online shopping and advertising,** thus, AI is widely used to provide personalized recommendations to internet users based on their previous searches or purchases, for example, or other types of online behaviour. AI is of enormous importance in the economy, for product optimization, inventory planning, logistics, etc.
- **Internet search.** Search engines learn from the huge amount of data entered by users to provide relevant results;
- **Personal digital assistants.** Smartphones use AI to offer the most tailored and personalized products. Virtual assistants who answer questions, provide recommendations and help organize daily activities have become ubiquitous;
- **Automatic translation.** Translation software, in written or spoken language, uses artificial intelligence to make the translations, but also to improve them;
- **Smart homes, cities and infrastructures.** Smart thermostats learn from our behavior to save energy, and smart city developers hope to control traffic to improve connectivity and reduce congestion;
- **Automobiles.** Although autonomous vehicles are not yet the norm, automobiles are already using AI-based safety features. The EU has, for example, contributed to the funding of VI-DAS, automated sensors that detect possible dangerous situations and accidents. Cars' navigation is heavily based on AI;
- **Cyber Security.** AI systems help identify and combat cyber-attacks and other cyber threats based on continuous data input, recognizing patterns and tracing attacks;

- **Artificial Intelligence used against epidemics.** In the context of the COVID-19 epidemic, AI is being used in thermal imaging in airports and other crowded places. AI can help recognize infections with computed tomography of the lungs. It has also been used to collect data to track the spread of the disease;
 - **Combating disinformation.** Certain AI applications can detect fake news and disinformation by mining fake information posted on social media platforms, looking for sensational or alarmist words, and identifying online sources deemed official.
- **AI is expected** to transform virtually all aspects of life and the economy. Here are just a few examples:
- **Health.** Researchers are studying how AI can be used to analyse large amounts of medical data and find patterns that could lead to new discoveries in medicine and improved patient diagnosis. For example, an AI program was created to respond to emergency calls, recognizing a cardiac arrest during the call faster and more frequently than the medical dispatcher. Another example is the EU-co-founded project Kconnect, which is developing multilingual text search services to help people find the most relevant medical information available;
 - **Transport.** AI could improve the safety, speed and efficiency of rail traffic by minimizing wheel friction, maximizing speed and enabling autonomous driving;
 - **Manufacturing.** AI can help European manufacturers become more efficient and bring factories back to Europe, by using robots in manufacturing, optimizing sales and anticipating maintenance or outages in smart factories in time;
 - **Food and agriculture.** Artificial Intelligence can be used to build a sustainable food system in the EU, AI can ensure a healthier diet by minimizing the use of fertilizers, pesticides and irrigation, as well as supporting productivity and reducing environmental impact. Robots could remove harmful plants, thereby reducing the use of herbicides. Many farms in Europe are already using AI to monitor the movement, temperature and feed consumption of their animals;
 - **Administration and public services.** Using a wide range of data and recognizing patterns, AI could provide early warnings of natural disasters, enabling effective preparation and mitigation. AI can contribute decisively to improving the management of all entities that are part of the Public Administration. Unfortunately, now in Romania, the political class and the bureaucracy in all the

country's institutions are hostile to any progress possible through the involvement of recent technology in the field of AI;

- **Defence and military systems.** Already for some time, in military systems, especially in those of advanced Western states, new AI technologies are successfully applied. I will write about this topic in a separate section.

3. Use of AI in Defence and military systems

• In almost all armies of the world there are concerns and already notable results in the use of AI in military operations. Of course, the tone and pace is set by the United States of America, benefiting from the research and technological development potential of large corporations in the IT&C field, thus:

Using AI in electronic warfare³:

-**Electronic warfare (EW)** is one of the most important features of modern warfare. Recent developments in artificial intelligence suggest that this emerging technology will have a major and potentially transformative influence on military power. AI-based algorithms can be very effective in various areas of EW, such as processing radar signals to develop effective anti-jamming algorithms. Also, revolutionary AI techniques can enable a complex EW system to operate autonomously.

-**Autonomous weapon systems based on AI**⁴. As Artificial Intelligence finds its applicability in more and more areas of human activity, governments around the world are increasingly investing in military applications of AI with the goal of gaining an advantage over potential adversaries, creating increasing pressure for others to follow suit. Actually, we assist to a recent AI arms race. At this time, it is about applications in the field of logistics, military transport, ensuring the maintenance of various equipment and systems, surveillance sensor systems, modern communication systems (C4ISR) and, of course, up to analysis and decision-making

³ Nicolae Sfetcu, „Utilizarea inteligenței artificiale în războiul electronic”, available at: <https://www.telework.ro/ro/utilizarea-inteligentei-artificiale-in-razboiul-electronic/>, accessed on 26.11.2023.

⁴ Dumitru Ciurci, „Sisteme autonome de armament bazate pe inteligența artificială”, available at: <https://www.art-emis.ro/stiinta/sisteme-autonome-de-armament-bazate-pe-inteligenta-artificiala>, accessed on 27.11.2023.

systems. Autonomous weapon systems capable of performing tasks and missions on their own are already being developed. It is about the controversial **killer robots** that can act autonomously and destroy human beings. This topic is much broader and it should be developed in a separate material. The views of the UN should be seen, as well as the positions of military powers such as the USA, China, Russia, Great Britain, France, Israel, and South Korea. As far as Romania is concerned, there is not much to say at this point.

- **After the start of the war against Ukraine by the Russian Federation**, the production of drones with various purposes (observation, fire control, strike, etc.), devices that act from the air, as well as on water - on the surface or in the underwater environment, gained momentum.

4. Risks and possible threats of Artificial Intelligence developed without rigorous human control

• **Political leaders, giant producers in the technology sector and experts in Artificial Intelligence gathered, on Wednesday 01 November 2023, in Great Britain, on the occasion of the opening of the first global summit on the risks generated by the meteoric rise of this technology⁵:**

- The ongoing technological revolution gives rise to hopes and wishes, but also to justified fears. These possible dangers and threats were discussed at Bletchley Manor, UK;
- Participants debated potential next-generation AIs, such as the ChatGPT conversational bot (see recent OpenAI Company board disputes related to CEO Sam Altman's ouster and then recent return to the company's leadership⁶);
- **High-level political representatives**, such as the President of the European Commission Ursula von der Leyen, the Secretary General of the UN Antonio Guterres, the American Vice President Kamala Harris and the Prime Minister of Italy Georgia

⁵ „Primul summit global privind pericolele A.I.”, available at: <https://www.hotnews.ro/stiri-international-26649501-primul-summit-international-privind-pericolele-incepe-intr-loc-emblematic-din-doilea-razboi-mondial-numele-grele-care-participa.htm>, accessed on 27.11.2023.

⁶ Vlad Barza, „Pericol pentru umanitate”, available at: <https://economie.hotnews.ro/stiri-it-26704240-pericol-pentru-umanitate-angajatii-openai-avertizat-sefii-obtinut-salt-tehologic-major-domeniul-inteligentei-artificiale-stim-despre-proiectul-secret.htm>, accessed on 27.11.2023.

Meloni, analyzed the recent developments in the field of AI and signed the Bletchey Declaration, regarding the safety of Artificial Intelligence. The document was signed by the UK, USA, EU and China;

- **UK**, the host of the meeting, warned that the dangers posed by AI are great. It is appreciated that generative artificial intelligences, capable of producing texts, sounds and images following a simple request and in just a few seconds, have made lightning progress in recent years, and the next generations of these models should already appear in the coming months;
- **Politicians and specialists** appreciate that there are huge hopes for medicine, education, economy, etc., but it could also cause an “**existential threat**” by destabilizing societies, allowing the manufacture of smart weapons that can escape from people’s control. The challenge is to define safeguards without hindering the innovation of AI labs and tech giants.

• **Ahead of the UK summit, some states and companies have established a number of AI regulations:**

- The EU and the USA have chosen the path of regulation, with President Joe Biden announcing a series of rules and principles that are meant to “**show the way**” to be followed at the international level;
- A week before the summit, several companies, including OpenAI, Meta (Facebook) and DeepMind (Google), agreed to make public some of their AI security rules at the UK’s request.

• In the context, we have to show that on Thursday, 23.11.2023, it appeared the news (Vlad Barza, HotNews) ⁷: “**Danger to Humanity**”. OpenAI employees have warned their bosses that they have achieved a major technological leap in the field of Artificial Intelligence by developing a secret project called Q* (QStar).

5. Some conclusions

• **The rapid and spectacular developments** in the AI field will hold the public agenda around the world for years to come.

• **Politicians, bureaucrats and specialists in Romania** should be connected to the current realities regarding AI technologies and analyze the possible impact (positive and negative) on the national society.

• **Military personnel of all functions and ranks**, from four-star generals to soldiers, should realize as quickly and professionally as possible the major impact AI technology has on all aspects of armed combat,

⁷ Idem.

especially in current geopolitical conditions, full of risks and threats to world peace and therefore to Romania's security.



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