

time to be in the industry, as further materials developments and process controls evolve to further automation and perfection of 3D printing for the use in thousands of applications [2].

### **References:**

1. What is 3D printing? [Electronic resource]. – Access mode: <https://3dprinting.com/what-is-3d-printing/>
2. How does a 3D printer work? [Electronic resource]. – Access mode: <https://www.stratasysdirect.com/resources/tutorials/what-is-3d-printing>.

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## **ARTIFICIAL INTELLIGENCE IN OUR LIFE**

Artificial intelligence is a branch of computer science that aims at creating intelligent machines. It has become an essential part of the technology sector. Artificial intelligence is a unique product of technological progress, which enables the machine to learn, using human and personal experience, to adapt to new conditions within its scope, to perform diverse tasks, to predict events and optimize different types of resources.

Most examples of the use of AI, known today, from chess computers to autonomous robotic systems, are still human-dependent and need in-depth training. However, even at the stage of their current progress, they globally affect the livelihoods of the entire society, forming new ideas about the future and the prospects for the development of modern technology.

### **What is AI today?**

#### *AI automates a continuous learning process*

AI reliably, systematically and tirelessly performs large-scale computerized tasks. For such a type of automation, the human factor is still necessary to create an efficient and correct system for processing key queries and making appropriate decisions. However, this does not require as much effort as before.

### *AI intellectualizes the product*

AI converts standard automated systems into an intelligent product that works according to the user queries. It is the basis for improving devices by giving them the ability to respond to needs, solve a certain range of problems and analyze them. Modern automation, talking platforms, smart bots and intelligent machines work with a huge amount of data to improve many technologies at home or in the workplace.

### *AI operates a huge amount of data*

When the algorithms are learned, the data becomes the intellectual property. Because the role of data is now more important than ever, it can create a competitive advantage. If you have the best data in a particular competitive industry, you will become better on the market.

### *AI adapts*

AI develops using advanced learning algorithms and generates data for further programming. AI independently finds the structure and patterns in the data, treating them in such a way that in fact the algorithm itself acquires a certain skill. For example, it becomes a classifier or predictor. The possibilities of such training are unlimited in terms of the use of intelligent machines to solve a wide range of tasks. Models quickly adapt to the receipt of new data that gradually leads to the complete exclusion of errors in the implementation of a particular automated process.

### *AI analyzes more in-depth data*

Deep and thorough analysis brings to the surface all potential risks, generates forecasts and warnings, eliminates the adoption of false decisions, prevents serious situations when reproducing a certain technical process or events, shapes the options for their development and possible consequences. In this case, AI learns and improves.

### *AI achieves extraordinary accuracy*

It makes use of intelligent systems in almost all areas of human activity. Technologies are involved in medicine, agro-industrial complex, trade, engineering, entertainment, mining, construction, all sectors of the economy and industry.

## **How does AI work?**

AI is a broad area of learning that includes many theories, methods, technologies and practices, as well as the following basic concepts:

### *Machine learning*

AI automates the construction of an analytical model, collects, analyzes and uses data statistics, forming ideas about how to perform certain tasks in different fields of activity.

#### *Neural networks*

This is the type of machine learning, with which a smart machine finds the necessary connections for correcting the task or making a correct decision in a particular situation in advance.

#### *Deep learning*

AI forms huge, multilevel neural networks, using the benefits of computing power and advanced training methods to study complex models in a large amount of data. Commonly available programs include image and speech recognition.

#### *Cognitive calculations*

AI uses cognitive calculations to simulate processes that a person usually performs, interprets the image and language, and then can speak and act consistently in response.

#### *Computer vision*

AI relies on pattern recognition and in-depth study of what's happening on an image or video. When machines can process, analyze and understand the image, they can independently interpret them and propose their own decisions on the processing and use of the material.

Humanity has come close to the moment when artificial intelligence moves to the next level of development. The field of AI is developing rapidly, so its use is expanding. The introduction of AI will not only be successful, but will also be one of the important factors that will affect our life and work. With proper planning and development, cognitive technologies can lead us to a golden age of high productivity, job satisfaction and prosperity.

#### ***References:***

1. Мороз О. Штучний інтелект // Філософський енциклопедичний словник. – Київ: Абрис, 2002. – С. 727.
2. Нікольський Ю.В. Системи штучного інтелекту: навч. посіб. / Ю. В. Нікольський, В. В. Пасічник, Ю. М. Щербина; — Львів: Магнолія-2006, 2013. – 279 с.
3. Ткаченко Р. О. Засоби штучного інтелекту: навч. посіб. / Р. О. Ткаченко, Н. О. Кустра, О. М. Павлюк, У. В. Поліщук. – Львів: Вид-во Львів. Політехніки, 2014. – 204 с.

4. Bach Joscha. Seven Principles of Synthetic Intelligence [Electronic resource]. – Access mode: <https://sit.instructure.com/courses/22632/files/2992213>
5. Egmont-Petersen M. et al. Image processing with neural networks – a review // Pattern Recognition. – Volume 35, Issue 10, October 2002, p. 2279 – 2301.
6. Marcus Gary. Is "Deep Learning" a Revolution in Artificial Intelligence? [Electronic resource]. – Access mode: <https://www.newyorker.com/news/news-desk/is-deep-learning-a-revolution-in-artificial-intelligence>.

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## **METHODS OF TESTING DESKTOP AND WEB APPLICATIONS**

Today the process of software development includes many aspects but special attention is paid to testing. Software testing is an assessment of the product software being developed to check its capabilities, abilities and compliance with the expected results. To do this, you need to consider the internal structure of the program and make some reasonable assumptions about the presence of errors and their grouping in different parts or modules of the program. At the same time, it is desirable to qualify groups of errors: errors made by experienced programmers, errors made by low-skilled programmers, or errors that are the result of poorly developed common ideas. Early detection of such groups of errors increases the efficiency of the testing process, for example, if more errors are found in any part of the program than in others, additional psychological, economic or technical efforts should be directed to 120 of its testing. So, the **aim** of our investigation is to present testing methods of desktop and web applications.

As we have seen from the studied sources, today there are the following testing methods, as: black box method, white box method, gray box method. If we consider object-by-object testing, it can be divided into functional testing, user interface testing, localization, speed and reliability, security and compatibility testing. Subjects of testing: alpha-tester, beta-tester [1; 3].

There are the following testing criteria: