

Votentsev Alexey Sergeevich

Student

Ural Federal University

Russia, Yekaterinburg

Research advisor: Tkacheva Marina Viktorovna

ARTIFICIAL INTELLIGENCE

***Abstract:** The creation of artificial intelligence is perhaps the most significant event for humanity. The creators of artificial intelligence insist that machine intelligence is useful and was created to help people. The power of artificial intelligence, which inadvertently causes destruction, cannot be underestimated. Scientists can control the potentially harmful effects of AI, and right now we can enjoy the fruits of all innovations. AI will not only change our way of thinking or life, but it will also open new horizons, even if it is space or the ocean.*

***Keywords:** Artificial Intelligence; Machine Learning.*

Вотенцев Алексей Сергеевич

студент

Уральский федеральный университет

Россия, Екатеринбург

Научный руководитель: Ткачева Марина Викторовна

ИСКУССТВЕННЫЙ ИНТЕЛЛЕКТ

***Аннотация:** Создание искусственного интеллекта, пожалуй, самое значимое событие для человечества. Создатели искусственного интеллекта настаивают на том, что машинный интеллект полезен и был создан, чтобы помогать людям. Силу искусственного интеллекта, которая непреднамеренно вызывает разрушения, нельзя недооценивать. Ученые могут контролировать*

потенциально вредные последствия ИИ и уже сейчас мы можем наслаждаться плодами всех инноваций. ИИ не только изменит наш образ мыслей или жизнь, но и откроет новые горизонты, даже если это космос или океан.

Ключевые слова: *Искусственный интеллект; Машинное обучение.*

What is Artificial Intelligence?

Artificial intelligence is a field of computer science engaged in the development of intelligent computer systems. These are systems with capabilities that we traditionally associate with the human mind - understanding the language, learning, the ability to reason, solve problems, etc.

AI is not a format or function, it is a process and the ability to think and analyze input data. AI is not intended to replace humans. Its goal is to expand human skills and abilities that makes it a valuable business resource.

The objective of this science is to provide reasonable reasoning and action using computer systems and other artificial devices. The following main difficulties penetrate this path:

a) In most cases, before receiving the result, the algorithm for solving the problem is unknown. For example, there is no way to tell exactly how the understanding of the text occurs, the search for the proof of the theorem, the construction of an action plan, image recognition;

b) Artificial devices (for example, computers) do not have a sufficient level of initial competence. The specialist achieves the result using his competence (in particular, knowledge and experience).

How relevant is AI?

The conversation about how the artificial intelligence industry will change the world in the future continues. The problem of creating artificial intelligence is very relevant, because people from ancient times sought to simplify their lives by transferring part of their responsibilities to special devices. Previously, this problem was limited to the creation of machines or robots that were capable of performing heavy physical work. But with the development of science, people increasingly began to think about creating a machine with capabilities of performing mental work. The relevance

of creating artificial intelligence is currently associated with the complexity of the problems that modern humanity must solve. In our time, science has reached such a level of development that it has become possible to create artificial intelligence. Nevertheless, many scientists are skeptical of this problem, since there are many problems that cannot yet be solved from a scientific point of view.

Two learning approaches.

AI research is based on two different and somewhat competing methods: a symbolic (or «top-down») approach and a connectionist (or «bottom-up») approach. The top-down approach is aimed at copying intelligence by analyzing cognition that is independent of the biological structure of the brain. A bottom-up approach, on the other hand, involves the creation of artificial neural networks to simulate the structure of the brain.

In another way, they are called neurocybernetics and black box cybernetics. The main idea of neurocybernetics: the only object capable of thinking is the human brain. Therefore, any “thinking” device must somehow reproduce its structure. The basic idea of black box cybernetics: it does not matter how the “thinking” device works. The main thing is that it reacts to given input influences in the same way as the human brain.

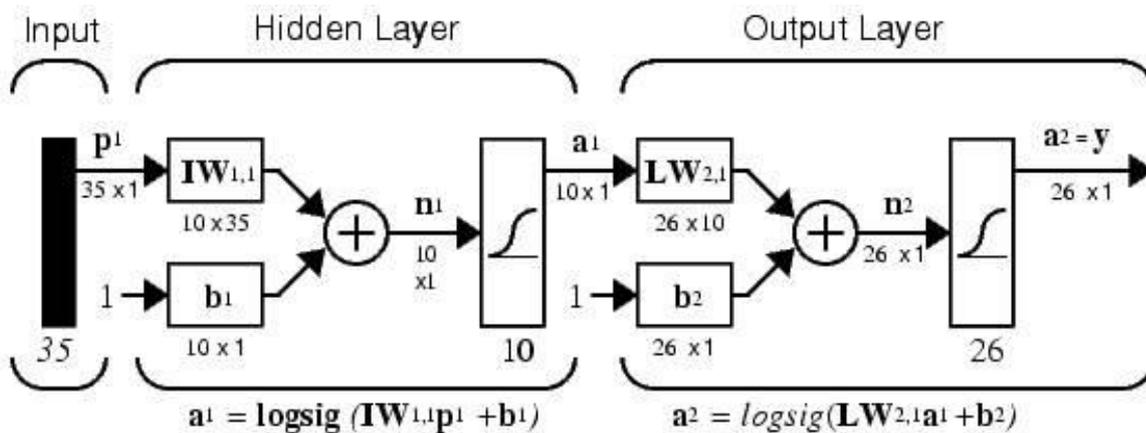


Figure 9. Bottom-up approach

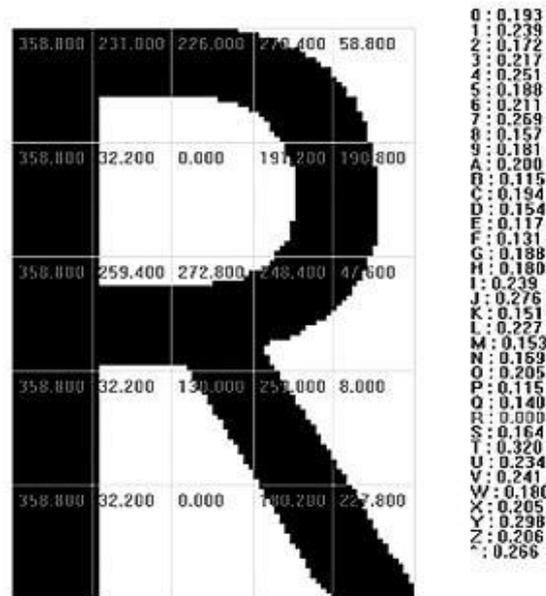


Figure 10. An example of forming a zone description for a reference image of the symbol R (Top-down approach)

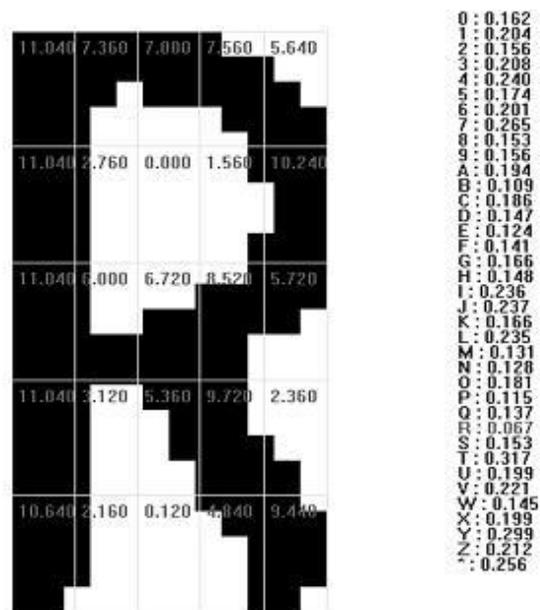


Figure 11. An example of the formation of a set of intersections for a real image of the symbol R (Top-down approach)

The «third way» of doing science.

Some scholars have talked about how machine learning will fundamentally change the research. For example, generative modeling can help to identify the most reliable theory, based solely on observational data, without any prior knowledge of the physical processes of the system.

Traditional science relied primarily on observation. In addition, science has moved forward through simulations and traditional modeling. Generative modeling is different from these two methods. Its proponents see AI as a powerful tool that will greatly facilitate scientific research.

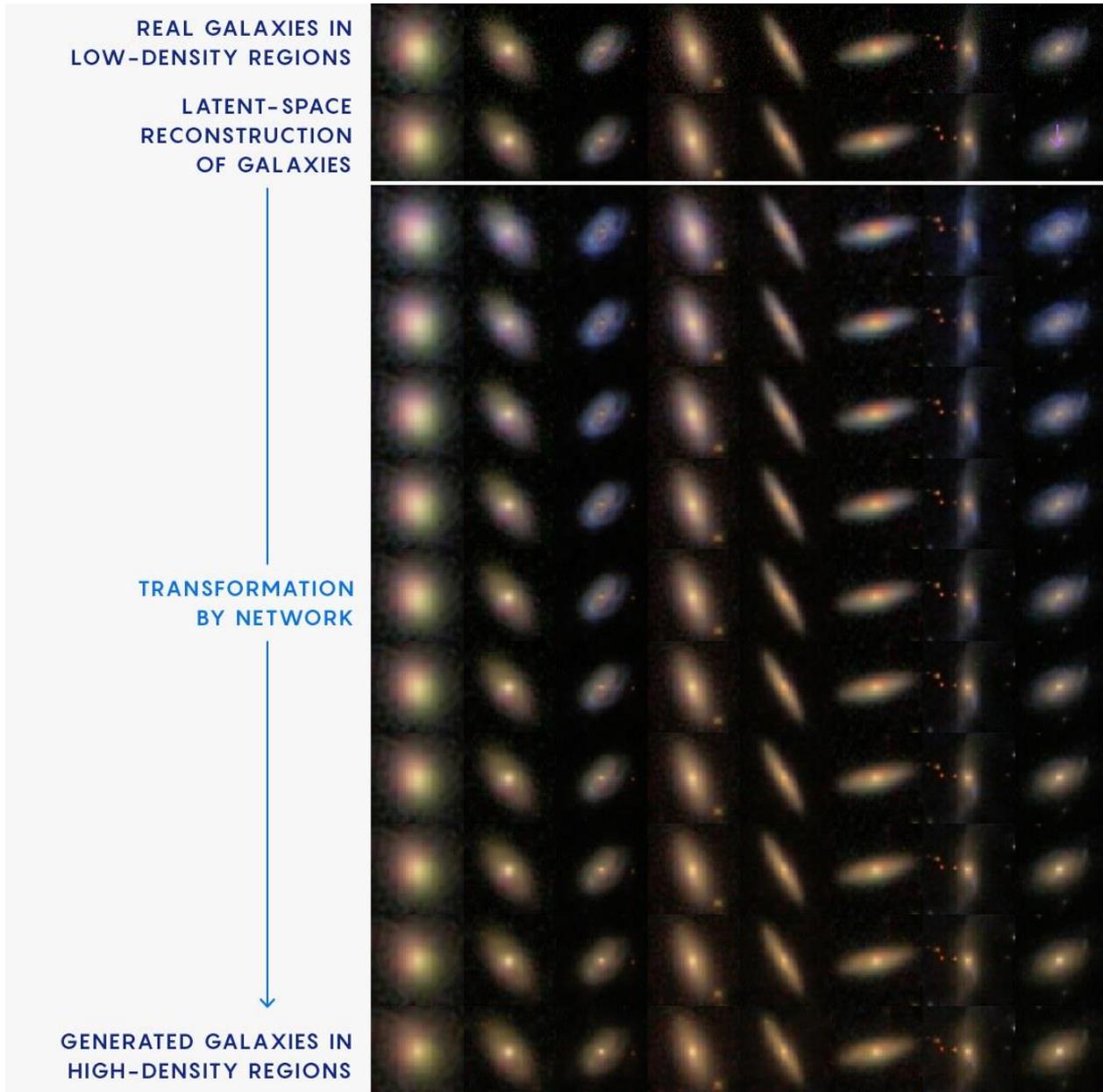


Figure 4. Galaxies generated by AI

People in these photographs do not exist in reality. A generative-adversarial network (GAN) creates the faces in columns A and B by using fragments of real faces. These network-combined fragments of faces from column A with faces from column B and created new faces.

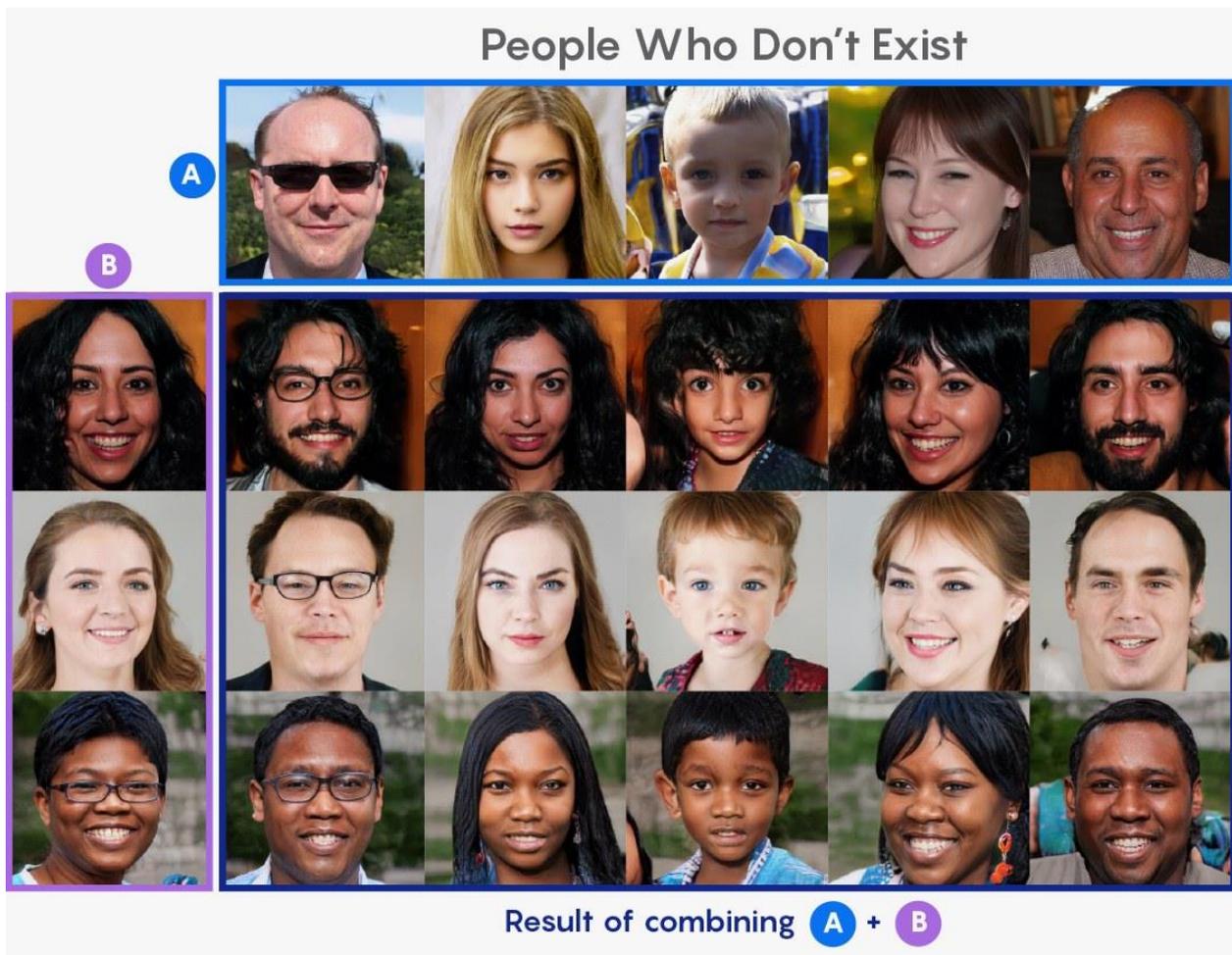


Figure 5. Photos of people generated by AI Advantages.

Besides the fact that artificial intelligence is very useful in science, we get some advantages in any field when we use AI.

Repetitive Tasks

Artificial intelligence can be effectively used in repetitive, painstaking and time-consuming tasks. Machines think faster than people and it can be multitasking.

Difficult Exploration

Expert systems help to develop effective solutions where there are not enough highly qualified specialists (distance learning, preliminary medical diagnoses, etc.).

Availability 24x7

The big advantage of AI is that cars do not need sleep and breaks for rest or lunch. They can do the same job repeatedly and they will not be bored.

Education

One of the most promising innovations is the idea of a personal AI tutor for each individual student. Since one teacher cannot work with each student at the same time, AI tutors will allow students to receive additional individual assistance in areas of necessary growth.

Examples.

There are examples of AI in the modern world.

Siri:

Smartphones are a great example of artificial intelligence. Applications such as Siri, which acts as a personal assistant, maps and GPS, which provide the user with the shortest routes to their destination, applications that predict user actions, as well as recommendations. Thus, we see that AI makes everyday life easier.

Internet advertising:

The proliferation of artificial intelligence technologies has completely changed the industry. The more data you can process, the better they will allow you to understand each specific user, and, accordingly, show him the most relevant advertisement.

Machine learning algorithms identify patterns of behavior in huge data sets over a long period of time, including online and offline buying behavior, and also predict the results. Then the most favorable forecast scenario is created and the product is selected that is most likely to interest a particular user (given his age, location, etc.)

The resulting ads are tailored for each individual buyer and are likely to produce the desired result.

Tesla:

This electric vehicle manufacturer designs and implements artificial intelligence for driving cars. Elon Musk claims that Hardware 3's digital vision will process up to 2,000 frames per second. This is the company's own product. Previously, Tesla used Nvidia Drive, equipment that was less efficient (200 fps).

Elon Mask's predictions are fantastic. The billionaire says that in 10 years, artificial intelligence will surpass a man in safety and reliability of driving a car.

Vision labs:

This startup makes face recognition technology for business customers. Products are focused on security systems, video surveillance, banks, the financial sector and retail. The company claims that its system processes images 200 times faster than competitor designs. According to MIT (Massachusetts Institute of Technology), this is one of the three best commercial facial recognition systems in the world.

Conclusion

In conclusion, we would like to point out that the goal of AI is to ensure the operation of software products capable of analyzing input data and interpreting the results. Artificial intelligence is a tool that provides a more intuitive process of human interaction with programs and assistance in making decisions within certain tasks. AI is not a substitute for man, and in the near future, it will not.

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