

CHALLENGES POSED TO HUMANITY BY NEURAL NETWORKS AND WAYS TO OVERCOME THEM

Neural networks, machine learning and artificial intelligence are words that sound more and more often in our lives. These technologies already have a significant impact on many areas of human activity, and their importance will only increase in the future. However, in addition to new opportunities, neural networks pose a number of challenges to humanity.

The purpose of this work is to investigate the challenges posed by neural networks to humanity and the ways to overcome them.

Artificial intelligence (AI) is a concept that describes the intelligent behaviour of machines and software. AI encompasses the theories, methods, and technologies that enable computer systems to perform tasks that normally require human intelligence. Machine learning is a branch of artificial intelligence that focuses on developing algorithms and models that allow systems to improve their performance. In turn, neural networks are a type of machine learning that imitates biological neural networks.

In recent years, neural networks for working with images, as well as chatbots for working with natural language, have gained wide popularity. These neural networks are built using deep learning techniques.

Deep learning models, while powerful and flexible, have a number of drawbacks. Experts in artificial intelligence single out several problems in the development and use of AI deep learning models, such as:

Lack of quality labelled data for model training. Retrieving a large volume of data that is not protected by copyright is not always possible. Companies have to use lower-quality data to train models, which can negatively affect the quality of answers.

Difficulty interpreting the principles of deep neural networks is also a significant problem. Decision-making processes in deep learning models are too complex and often resemble "black boxes". The lack of transparency hinders trust in these models and makes it difficult to use them in such important areas as finance or healthcare.

Vulnerability to adversary attacks, where small changes in the input data lead to classification errors, is another problem of neural networks.

The need for safe training of models to prevent deployment errors is a significant challenge, as research in this area is still at an early stage.

Neural networks cause concern not only among experts in the field of artificial intelligence. In his research, Rakesh Kochhar found that 19% of US

workers are employed in jobs with a high level of AI influence. This means that potentially millions of people around the world could be partially replaced by artificial intelligence or lose their jobs.

The rapid development of neural networks is also seen as a problem in the field of ethics. Brian Patrick Green, Director of Technology Ethics at the Markkula Center for Applied Ethics, writes: “Why is AI ethics becoming a problem now? Machine learning (ML) through neural networks is advancing rapidly for three reasons: 1) Huge increase in the size of data sets; 2) Huge increase in computing power; 3) Huge improvement in ML algorithms and more human talent to write them. All three of these trends are centralizing of power, and “With great power comes great responsibility.” [3] Philosophers and sociologists identify numerous problems in AI: superintelligence, humanity’s dependence on AI, human isolation, AI rights, malicious use, etc.

Solving many problems and challenges associated with the development of neural networks and artificial intelligence requires a coordinated effort from the research community, industry, governments, and civil society. Artificial intelligence experts emphasize the need for investment in the field of artificial intelligence security. Experts in ethics and sociology offer different approaches to AI: legislative regulation of the use of AI, involvement of interested parties and transparency, educational programs for adapting the workforce to AI transformation, interdisciplinary research – involving specialists in ethics, law, sociology, psychology to study the consequences of development AI.

So, despite the potential, neural networks pose challenges and threats to humanity. Only careful cooperation of all parties will allow realizing the potential of AI and help avoid negative consequences.

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