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THE ETHICS OF THE USE OF ARTIFICIAL INTELLIGENCE IN THE DEVELOPMENT OF INFORMATION TECHNOLOGIES

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Abstract. *The widespread use and application of AI has increased the efficiency of work in various areas of life, in particular, AI has been used in web design, finance, programming, healthcare and education. Its widespread use increases the efficiency of work and has advantages in use in various areas of life, but at the same time develops important ethical problems, in particular: the age of privacy (privacy leakage), discrimination and data security risks. In this article, we try to summarize the analysis of ethical risks and problems, explore approaches to solving ethical issues in AI.*

Key words: *Artificial Intelligence, machine learning, algorithm, development.*

Introduction.

Artificial intelligence (AI) is achieving rapid and impressive development of the last years. AI technologies such as machine learning (ML) and natural language processing, the development of computer vision are increasingly penetrating and expanding various disciplines and aspects of our society, and are also replacing human resources in decision-making. Therefore, research on this topic is particularly relevant in our time.

Main text.

The use of artificial intelligence has led to increased productivity of companies and reduced costs for performing the same actions of people, compared to artificial intelligence. For example, the created AI chatbot can respond to customer requests at any time of receipt, does not require vacation, sick leave, and also pays wages.

At the same time, artificial intelligence creates many significant ethical risks and problems for users, developers, and society in general [1]. Over the past few years, there have been many cases of AI use that were accompanied by poor results. Also, Microsoft's artificial chat Tay.ai was removed a day after joining the social network X (formerly Twitter), the latter of which used racist and intersex judgments. Recently,



the number of opportunities for criminals to use AI has increased, in particular fraudsters have used the software in order to make the voice of the company's CEO heard and demand a fraudulent transfer in the amount of 243 thousand dollars [2]. Often, children become victims of unfair use, their photos are downloaded from social networks and various videos of an indecent nature are formed. There are many other examples related to failures, fairness, bias, confidentiality and other ethical problems of AI systems, so it is important to find solutions to these problems, especially when using it in education and information technologies.

Artificial intelligence ethics or machine ethics is a new interdisciplinary field that deals with solving ethical issues of artificial intelligence, it is a broad field of research that is developing rapidly.

There is an increasing number of studies related to this topic, in ethical issues are described in three categories: problems caused by the characteristics of AI, ethical risks caused by the human factor, as well as the social impact of ethical issues [3].

ML is the core technology of neural networks, including artificial intelligence, but it is difficult to explain the logical inference process of ML, which leads to the problem of transparency. The lack of transparency leads to the problem of explanation and difficulty in monitoring by humans and in the management of AI, which is the most discussed drawback.

This process is very difficult to understand and explain how the ML inference is formed, which is called a “black-box”. Let’s look at the concept of a “black-box” in more detail, because its inner workings remain opaque, so it is difficult for users to understand how decisions are made. The lack of transparency raises concerns about trust, ethics and accountability, especially in industries with important goals, such as healthcare, finance and law enforcement.

Black-box AI refers to artificial intelligence systems where the internal processes remain hidden from users, making it difficult to understand how decisions are made. In these systems, complex algorithms, often using deep neural networks, process data in a way that mimics the human brain by distributing input across multiple artificial neurons. The resulting complexity makes it difficult, if not impossible, for humans to



understand the reasoning behind AI decisions. This creates a situation where the result is obvious, but the steps leading to that result are unclear.

The term “black box” dates back to the 1940s, when it was first used in the aerospace industry to describe flight recorders. Over time, as AI has evolved, especially with the development of sophisticated machine learning models, the term has found its place in the AI realm. Today, black box AI systems are becoming increasingly common across industries, despite their opaque nature.

When using AI in training, a large amount of data is required to develop a given language model, which likely includes personal and private data. Large companies and organizations are forced to collect or purchase data, including sensitive data, even if this partially violates the individual’s right to privacy. If personal information is de-identified [4] through randomization, data synthesis and other technologies, it will no longer be considered personal information and will not be protected by traditional laws. The misuse and abuse of data, such as the leakage or falsification of (personal) information, is a serious ethical issue, and data security and privacy are key issues that users face when developing and applying AI technology. If an algorithm is developed on insufficient or inaccurate data, the algorithm will produce undesirable results, even if in a lot of effort and money has been invested in its development. Conversely, even if a large amount of accurate data is fed into an ML algorithm, but the algorithm itself is poorly designed, it will make poor predictions. For example, a poor ML algorithm cannot recognize a pattern or find flaws in this pattern. The use of intelligent personal assistants (IPA): Apple’s Siri, Amazon’s Echo, Google’s Home run in the background and contribute to users’ concerns about data privacy.

It should be remembered that the important and complex question is how much autonomy (without human intervention or direct control) can be given to an AI system, as well as the control over the work of the AI.

Regarding ethical issues related to the human factor, the development of comprehensive and unbiased standards for training or regulating AI is essential. In particular, software engineers and other participants in the design of artificial intelligence systems must take into account human rights laws when developing them,



because there are many different laws issued by different governments and the language model must take this into account.

An important issue is liability, because when using an AI system, tasks are performed that have undesirable consequences, which may be the result of an error in the programming code, input data or other factors. Therefore, accountability is an ethical issue related to the human factor that requires further improvement and research.

The social impact of ethical issues is mainly related to automation and transformation of the labor market, and it is also necessary to take into account that it is important to have access to and spread of AI in the same quantity and quality for all segments of the population in order to avoid discrimination in the labor market, since it would be unethical to have access to AI capabilities only for a certain group of people. As AI improves, intellectual differences between people will decrease, AI capabilities will become more sophisticated, creative and universal, which will contribute to the obsolescence of jobs in the classical sense.

Difficult ethical issues are those related to human vulnerability. AI technologies are good at recognizing faces and thus pose a danger to citizens, since such technology can monitor citizens, and ML can create very realistic videos and photos that are difficult to recognize as fake. Such capabilities raise concerns about the abuse of AI technologies.

Robots developed on the basis of AI can replace a significant amount of current human work in the near future, which will lead to the loss of a large number of jobs.

Let's focus on ethical issues directly related to algorithms. The safety of algorithms, since the development of the model is achieved by training it on different data by optimizing its parameters, if the parameters of the algorithm model are leaked, then outsiders can copy the model. Such actions will cause significant economic losses to the owner of the model, since people will receive the same model without paying for the cost of training, development, and so on. The next problem is that the parameters of the AI model can be illegally changed by attackers and can lead to undesirable consequences. In many developments, the performance of the model is closely related



to personal safety, for example, in the field of medicine or autonomous driving. Any error in such an algorithm can seriously harm people and lead to negative consequences. Algorithmic decision dilemma: when receiving a developed algorithm, it is difficult to predict its actions and the consequences that it will cause. This leads to a risk-based decision-making algorithm or algorithm dilemma. For example, autonomous vehicles should reduce the number of negative events on the road, but in a critical situation, the AI must choose one of two bad solutions: either save the passengers in the car, but crush pedestrians, or, conversely, sacrifice itself for the sake of saving pedestrians and it is difficult to predict which solution the algorithm will choose.

There is also an ethical problem related to the application, namely the discrimination or bias of algorithms. Algorithm abuse refers to a situation where people use algorithms for analysis, decision-making, coordination and other activities, but the use of the method and range of use have deviations that cause adverse effects. For example, an algorithm can be used to increase the level of security of citizens, but if the algorithm is used to detect by face whether someone has criminal potential, then such actions are algorithm abuse.

Based on the review of AI ethics and the many delights and problems described in this article, we conclude that the development of AI that can behave correctly and ethically is a complex problem. And the solution to this problem requires the joint efforts of scientists, engineers, programmers and politicians for a safe future associated with the development of technology and AI.

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