

3. Ethical dilemmas of artificial intelligence: balance between innovation and moral values

Nowadays, the sharpening of the relationship between ethics and artificial intelligence (AI) is becoming increasingly important in the context of the growing influence of technology on modern society. The question that arises, which the research process is tasked with answering, is: is it possible to clearly separate the moral principles that regulate human behavior from the principles that guide intelligent algorithms used in the latest technologies? This task is complicated by the fact that the rapid development of the technological sphere requires an updated approach to understanding and forming ethical norms. It is worth emphasizing that the line between ethics and artificial intelligence remains blurred, as modern technologies are increasingly penetrating various aspects of human life - from medicine and transport to communications and other industries. And although intelligent systems are able to help solve complex problems, increase convenience and efficiency, at the same time they can come into conflict with ethical norms and values that form the basis of human behavior.

Actually, the very idea of artificial intelligence is to create machines or programs capable of imitating human thinking, learning, decision-making and solving complex tasks, and today this is no secret to anyone. AI seeks to automate intellectual processes - from speech recognition to event prediction or even creativity. Its application already covers medicine, education, transport, business, security and other areas. The context of our research sets us the goal not only to identify the current challenges of artificial intelligence as such. And to consider this area of science in the context of ethics itself. Ethics, the main idea of which, in the context of AI, is to develop technologies that will be transparent, fair, safe and humane.

The main issue of our research focuses on the key contradiction between the rapid development of AI technologies and the insufficient level of normative and ethical regulation. In modern society, artificial intelligence is increasingly penetrating

various spheres of life - from medicine and education to military affairs and public administration. At the same time, the risk of ethical conflicts associated with decision-making by autonomous systems, the use of personal data, discrimination, manipulation and responsibility for the actions of AI is increasing. Despite technological progress, the ethical understanding of such challenges remains fragmented and does not always keep up with the pace of change. The problem is that the lack of clearly formulated ethical standards and international consensus on the development and use of AI can lead to human rights violations, increased inequality and even social destabilization.

Researchers in the field of our research emphasize the importance of transparency, fairness and responsibility in the development and use of AI. They also call for the creation of international standards and codes of ethics to ensure the safe and ethical use of AI. Among the famous scientists, we can highlight Peter Singer - a famous philosopher-ethicist, whose work on the ethics of AI contributed to the creation of a chatbot that stimulates ethical reflections using the Socratic method, Jason Gabriel - a political theorist at DeepMind, who developed ethical recommendations for autonomous AI agents, emphasizing the need for transparency and protection of user data. Kate Crawford - author of the book *Atlas of AI*, where she explores the impact of AI on society, including labor exploitation and environmental consequences, Demis Hassabis - CEO of DeepMind, who emphasizes the need for international cooperation for the safe development of AI, especially in the context of creating artificial general intelligence. Among the Ukrainian scientists, we can highlight Rimma Berdo, Volodymyr Rasyun, Vitaliy Velychko, who explore the ethical aspects of the use of AI in scientific research and education.

The aim of our research is to analyze how AI can interact with people and society in a responsible and ethical way, taking into account issues of security, transparency, privacy, fairness and lack of bias. This includes studying how AI can affect decision-making, interaction with users and its possible psychological and social consequences. In addition, the research focuses on the importance of adapting legal and ethical standards to rapidly evolving technologies to ensure their safe and correct use.

To begin the analysis of the direction of our research, we will begin by defining its key terms. Artificial intelligence is a concept that embodies the desire to create systems that can think, learn and make decisions like humans. Its essence lies in the ability to process large amounts of information, analyze it and act on the conclusions obtained. Thanks to this, AI can not only perform tasks that traditionally required human intelligence, but also develop in the process of learning.

The ethics of artificial intelligence emerges as a natural response to the impact of these technologies on society. It encompasses issues of moral responsibility, transparency, equality, and security. The goal of AI ethics is to ensure that technologies serve the benefit of humans without violating their dignity, rights, or freedoms. In this context, ethics is a bridge between technical progress and humanistic values [1].

One of the main aspects of the ethics of artificial intelligence is to determine the limits of its development, taking into account moral norms. This requires the development and establishment of ethical standards for the use of AI. For example, it is necessary to create principles that guarantee the absence of discrimination and the protection of people's privacy from inappropriate interference. Artificial intelligence can be used to achieve a variety of goals, from the automation of everyday tasks to the creation of new products and services. However, there are situations when the capabilities of AI exceed ethical norms. For example, its use to manipulate information or violate the privacy of individuals. Another key issue is balancing ethical norms with the possibilities of technological progress. For example, how to guarantee the safety and protection of people's privacy when applying AI in areas such as autonomous vehicles or medical systems. It is important to find a line between adhering to ethical principles and using technology to achieve useful results [2].

In the course of our study, we will once again emphasize that defining the boundaries between ethics and AI is an important step in ensuring sustainable and ethical development of technologies. This helps to avoid potentially negative consequences from the use of AI and guarantees the protection of people's rights and freedoms. Therefore, the distinction between moral principles and the possibilities of technological progress is a key aspect of the discussion of ethics and AI.

Here are some interesting facts. In 2024, the Ministry of Digital Transformation of Ukraine presented a "White Paper" and a roadmap for regulating AI. These documents provide for the gradual implementation of regulations harmonized with the European AI Act, with a focus on protecting human rights and supporting innovation. It is planned to introduce voluntary codes of ethics for business, create a "regulatory sandbox" for testing solutions, and launch a responsible AI portal. No less important and relevant is the fact that Ukraine is actively using AI in defense, in particular in drones and facial recognition systems. For example, the partnership with Clearview AI raises concerns about privacy and mass surveillance. Use of AI in drones: AI drones in Ukraine achieve 70–80% accuracy in targeting, which increases efficiency, but there may also be ethical questions about the autonomous use of force.

And what about public opinion regarding the ethics of AI? As statistics show, as of the end of 2024, the beginning of 2025, we have the following picture. According to the survey results, the majority of respondents - 73% - believe that artificial intelligence can make life easier. At the same time, 57% of participants express concerns about its progressive development, which indicates a certain level of concern among the population. 45% of respondents believe that the development of AI requires legislative regulation, which emphasizes the relevance of legal and ethical aspects in this area. It is noteworthy that 34% of respondents do not know what artificial intelligence is, and 27% could not decide on their opinion at all, which indicates an insufficient level of awareness and the need for broader public information.

Moral values and ethical principles have always played a key role in the life of society. However, with the development of modern technologies, new challenges have arisen that question traditional ideas about morality and ethics. In today's world of rapid technological progress, it is increasingly difficult to draw a clear line between ethical and unacceptable. This poses a threat to our established moral principles and rules of behavior. One of the main challenges is to determine where what is ethically permissible ends and what contradicts moral principles begins. A vivid example is the development of artificial intelligence, which raises questions about the ethics of its use in the military sphere or the possible impact on the confidentiality of personal data.

Moral dilemmas associated with technological progress are especially relevant in the field of genetics, where editing human DNA becomes possible. This raises serious doubts about the ethics of interfering with natural mechanisms and may carry potential risks for future generations. In order to correctly distinguish between moral aspects and technological achievements, it is necessary to take into account not only personal beliefs, but also the general social context. When making decisions about implementing new technologies, the principles of social justice and environmental protection should be taken into account.

Therefore, ethical issues that accompany technological development rarely have simple answers. Their solution requires constant public dialogue, in-depth analysis and a clear definition of the boundaries between morality and scientific and technological progress.

A vivid example of this is again the statistical data of a survey of Ukrainians regarding their attitude and interaction with AI. In our opinion, the obtained figures do not cease to be interesting.

Above, we have already provided statistical data on the perception of AI by respondents. At this stage, we want to continue the chosen direction and analyze the fact of trust in the texts offered by AI.

In 2024, 34% of respondents in Ukraine trusted texts created by artificial intelligence, while 25% expressed distrust; at the same time, 42% of those surveyed could not distinguish such texts from those written by humans, and only 20% believed that they were able to recognize them. Only 16% of Ukrainians believed that AI improves media content, while 35% believed that it worsens it. In total, 79% of Ukrainians knew about the existence of AI, but only 29% had experience using it, in particular, 33% used ChatGPT, mainly young people aged 18–29 (47%) and residents of Kyiv (46%). As we can see, according to the survey results, a quarter of respondents simply do not trust the information received. In our subjective opinion, this position can be explained by the fact that AI is currently a fairly new concept in the global information space.

In the process of developing artificial intelligence, various ethical challenges arise, in particular those related to privacy, security, fairness, autonomy and responsibility. Ethical principles play an important role in determining permissible actions, contributing to the protection of human rights and the harmonious implementation of AI. They provide the basis for interaction between people and AI, based on justice, efficiency and compliance with ethical norms [4]. With the development of artificial intelligence and modern technologies, there is a need to clearly delineate the boundaries between ethical principles and technological progress. This issue is especially relevant in the context of the impact of AI on the moral values of society. Moral values are formed on the basis of norms and principles that regulate the behavior of people in the social environment. AI, having the ability to process large amounts of information and make decisions based on them, can influence the transformation of these norms and principles. One of the key challenges is separating the decisions made by AI based on data analysis from those that are morally acceptable to society. Can AI, guided only by objective information, without taking into account the ethical context, cross the line of morality? This question requires deep reflection and the establishment of a clear ethical framework.

In our opinion, another important aspect is the impact of artificial intelligence on moral values, in particular on our ethical beliefs and attitudes towards other people. AI is able to analyze personal information and behavior patterns to form decisions or recommendations, which can create risks to privacy and give rise to serious ethical dilemmas. That is why it is necessary to introduce clear rules and principles regarding the collection and use of personal data by AI systems.

Of course, all these issues require serious attention and public dialogue in order to achieve harmony between technological progress and the preservation of moral guidelines. Establishing clear ethical norms is a key step to ensure the responsible and ethical use of AI, which will allow preserving values important to society. The issue of demarcation between technological progress and moral principles is becoming increasingly relevant in the context of the rapid development of artificial intelligence.

Today, it already has a significant impact on various areas of life - from healthcare to the economy and is increasingly integrated into our everyday lives every day.

We would like to emphasize that in the above context, ethics takes on special importance, as there is a need to form moral principles that should guide artificial intelligence systems. This becomes extremely important, since AI is able to influence the lives, freedoms and rights of people, as well as generate new moral challenges that society has not faced before.

One of the key ethical issues related to the development of AI is the establishment of a boundary between technological progress and moral principles. This task is particularly difficult, since technologies are constantly evolving, while moral principles are shaped by social norms and values, which can also change over time. We believe that to overcome the ethical challenges associated with the development of AI, it is necessary to create clear principles that would allow separating technological progress from moral principles. In this regard, it is important to take into account diverse points of view, involve experts from different fields, and actively involve the public in the discussion. In addition, ethical standards for AI developers should be developed, based on the principles of fairness, safety, transparency, and responsibility. This will help ensure that artificial intelligence works for the benefit of people and does not create threats or harm.

Artificial intelligence can perform a wide range of tasks, from decision-making and program development to data analysis and other functions. However, its use can pose risks of violating ethical norms and principles. That is why it is important to clearly define the boundaries of the use of AI in accordance with generally accepted ethical standards. One approach to such a demarcation is to formulate principles that should regulate the functioning of AI systems. These principles should be based on universal human values and ethical norms. For example, AI should operate in accordance with the principle of integrity, without causing harm to people or society. Another approach is to establish specific limitations and parameters within which AI should operate. These can include settings that prevent privacy or discrimination. It is also important to consider the context in which AI is used. Different situations require

different levels of ethical control: in some cases, a more flexible approach is possible, while others require strict standards of safety and accuracy.

The ethics of artificial intelligence cover many important aspects that go far beyond simple technical implementation. One of the main issues is the responsibility for the actions of AI. If AI makes decisions that lead to errors or even harm, who is responsible? Should responsibility be distributed between developers, users, or the systems themselves? This question becomes especially important in areas such as medicine, where a mistake can be critical, or in transportation, where AI can operate on autopilot.

Transparency of decisions is also an important topic in AI ethics. Many algorithms operate as “black boxes,” where the outcome is known, but the path to it is not always clear. This makes it difficult to understand why the system made a certain decision, which can have serious consequences, especially when it comes to affecting people’s lives. Therefore, one of the main requirements for ethical AI is to ensure its transparency, that is, the ability to understand and explain how the system came to its conclusion.

Another important aspect is the issue of discrimination and bias. Algorithms can reproduce bias that was embedded in the data on which they are trained. This can lead to AI, even without intention, making decisions that discriminate against certain groups of people. Therefore, it is very important for AI developers to pay attention to ensuring that the data is representative and free of hidden biases.

No less important is the issue of privacy and data protection. AI often works with vast amounts of personal information, which increases privacy risks. AI ethics therefore involves creating norms and rules for how data is collected, processed, and stored to ensure that people’s rights are protected. And, of course, there are issues of fairness and access. How can we ensure that AI technologies are accessible to everyone, not just a select few? How can we avoid digital inequality so that AI does not exacerbate social or economic disparities? These and many other issues require careful consideration and ongoing discussion to create an ethical framework for the

development of AI that will benefit society and ensure the fair and safe use of this powerful technology.

Another interesting fact in our opinion is that, formally, artificial intelligence is not prohibited in writing scientific articles, but its use raises a number of ethical and practical issues that require special attention. One of the main problems is the issue of authorship and responsibility. In scientific practice, it is important that authors are responsible for the content of publications, and if AI creates the text, the question arises as to who should be responsible for possible errors or inaccuracies.

Also, the use of AI to write articles can lead to the spread of misinformation. AI can generate texts that contain errors or do not take into account all the nuances of the study, since algorithms cannot always accurately understand complex scientific concepts or context. This creates the risk of publications that do not meet high standards of scientific accuracy.

Another problem is the risk of plagiarism or lack of originality. AI can create texts that are similar to already existing publications, which can violate academic standards and requirements for originality of research.

Finally, there are issues of ethics and integrity: scientific papers should reflect real research and the results of scientists' work. The use of AI, which creates the illusion of human work, may violate the principles of academic integrity and transparency.

Next, we would like to focus on the prospects for the development of artificial intelligence. The prospects of artificial intelligence for the future open up many opportunities for development, but at the same time pose many challenges. One of the main trends is the further automation of processes, which will lead to increased efficiency in production and the service sector. However, this also raises concerns about the reduction in the number of jobs, which will require society to adapt to new conditions. For example, AI promises significant changes in medicine, where it can become an important tool for improving diagnostics and developing individualized treatments. Personalized medicine based on AI will be able to predict diseases at an early stage and provide more accurate recommendations for treatment. In addition, AI

can change the approach to prevention, health monitoring, and even in the field of genetic research.

AI technologies are also actively penetrating the creative industries. Already today we can see its use in music, painting, literature and cinema. In the future, new forms of cooperation between people and AI will likely emerge, which will allow for the creation of unique works of art. However, this process raises questions about the nature of creativity and the role of humans in art.

On the other hand, the development of AI requires the resolution of serious ethical and legal issues. How to ensure that artificial intelligence does not violate people's privacy and does not pose a threat to their rights? How to properly regulate the use of AI in areas such as law enforcement, military technology and intelligence? The security, transparency and ethics of decisions made by AI will determine the direction of its development [5].

It is obvious that AI is gradually becoming an important part of everyday life, including through integration into "smart" systems for home and work. Robots, personal assistants, automated vehicles and many other new technologies will change our understanding of convenience and efficiency in various areas. However, this will also require a review of many social, ethical and legal norms to ensure their safe and equitable development.

It is becoming a powerful tool for improving the quality of life, in particular in matters of access to information and knowledge. With the development of artificial intelligence systems, people will be able to find solutions to complex problems faster, receive personalized advice in real time and solve tasks that previously required significant human resources. This will apply not only to the field of education, but also to social services, where AI can help optimize service delivery or even in city planning, adapting infrastructure to the needs of each citizen.

However, as we have repeatedly emphasized, with all the advantages comes the question of control and oversight of the use of such powerful technologies. How to ensure a balance between innovation and security? How to ensure that AI is not used for destructive purposes or to manipulate people? This raises the question of creating

international standards for AI ethics, which will clearly define the rules of use, as well as mechanisms for controlling and influencing the technology. It is especially important to consider AI in the context of its impact on social structures. For example, questions arise about how the use of AI will affect poverty and inequality. If access to advanced technologies is limited to certain countries or social groups, this may exacerbate existing global inequalities. At the same time, AI has the potential to help solve many social problems, in particular in the fight against global challenges such as climate change or poverty. Equally important is the role of AI in the development of new forms of work and learning. With the development of automation, new professions and specializations are emerging that will require people to have new skills and abilities. On the one hand, this opens up opportunities for creating new jobs, and on the other hand, there is a problem of retraining and training people whose professions may become obsolete due to technological changes.

We would like to highlight that Ukraine ranks second in Central and Eastern Europe in terms of the number of companies working in the field of AI. The number of such companies has increased from 97 to 243 over the past ten years, and the number of specialists in the field of AI has increased fivefold, reaching 5,200 people as of January 2024. Ukraine has the potential to become a leader in the field of AI through the development of education, the creation of spaces for AI training, and liberal regulation of this industry.

Artificial intelligence in Ukraine is developing actively, and its implementation in various areas brings significant economic and social effects, where AI is one of the main tools. For example, the IT hub in Kyiv and other cities of the country helps startups, research laboratories and technology companies to develop, exchange ideas and implement innovative projects. The state government and private investors are increasingly focusing on investments in the development of AI technologies. In Ukraine, there are a number of startups that are engaged in the development of solutions in the fields of financial services, healthcare, transport and production. An example is startups that develop systems for automating business processes, improving logistics and optimizing production chains. Educational programs are being developed that

allow training specialists in AI, preparing a new generation of experts capable of solving complex problems in this industry. Artificial intelligence is actively used in the media for news generation, automated translation, content creation and analysis of large data sets. Ukrainian media platforms are integrating it to better predict trends, track popular topics, and improve audience engagement [6].

In our opinion, one of the most promising areas is the development of autonomous transport systems that use AI for road safety. Experiments with autonomous vehicles are already underway in Ukraine, as well as programs to improve traffic management systems are being developed.

Ukraine is one of the largest agrarian countries in the world, and the use of AI in the agricultural sector helps to increase production efficiency and improve the environmental situation. There are already projects that use drones and sensors to monitor the condition of fields, predict yields and automate irrigation systems.

During our research, we have repeatedly emphasized that one of the main problems is the issue of ethics and regulation of AI in Ukraine. Today, the government is working to create a legislative framework that would ensure the safety of the use of AI and the protection of human rights, especially in the context of data privacy. Cooperation with international organizations and researchers allows us to avoid negative consequences from uncontrolled use of technologies.

The future of AI is not only about technology, but also about deep interaction with people, which opens up new horizons for joint development. How we will use these powerful tools depends on how we can solve all these challenges and ensure sustainable, ethical development of technologies.

The prospects for further research in the field of artificial intelligence look very large-scale and multifaceted. They encompass both technological advancements and a deeper understanding of how to make AI safer, more ethical, and more useful to society. One of the main directions is the development of so-called general artificial intelligence – systems that can think, learn, and act at a level similar to human intelligence, not just in highly specialized tasks. This is not only a technological

challenge, but also a philosophical one, as it forces us to reconsider our very understanding of consciousness, thought, and autonomy.

In parallel, research in the field of ethical AI will develop. This includes the creation of systems that will be able to take into account social, cultural and moral contexts when making decisions. The issues of algorithm transparency, non-discrimination, data protection and liability for the actions of artificial intelligence remain particularly relevant. An equally important direction will be the integration of AI into new areas where it has not yet been fully used - for example, in ecology, climatology, psychology, jurisprudence. AI can help model climate change, predict natural disasters, create individual psychological support programs or analyze large volumes of legal information. Interest will also grow in the creation of explainable AI - such systems that can not only produce a result, but also logically explain how they got to it. This is very important for the use of AI in medicine, law and other areas where trust in the system is required. And, of course, one cannot fail to mention the cooperation of AI with humans. One of the promising areas will be the development of so-called hybrid intelligence - when artificial intelligence complements human abilities, helping to think, create, and solve complex tasks, but does not completely replace humans.

All this will require a multidisciplinary approach - a combination of knowledge from computer science, philosophy, psychology, sociology, law. After all, the future of AI is not only about technology, but also about what our lives will be like with it.

The prospects for the development of artificial intelligence in the context of ethics are focused on solving complex issues related to the impact of technology on society, human rights and justice. One of the main challenges is ensuring privacy and data protection. AI is able to collect huge amounts of personal information, which threatens the confidentiality and security of individuals. Therefore, the development of ethical standards to ensure transparency in data collection and processing is necessary [7].

Another important problem is the transparency of algorithms. In many cases, modern AI models work as "black boxes", and their solutions can be difficult to explain

or not understandable to end users. This creates the risk of abuse when important decisions that affect people's lives are made based on algorithms that are opaque or difficult to understand. It is therefore important that in the future, AI operates within ethical norms and is accountable, especially in critical areas such as medicine or justice. Another important ethical issue is algorithmic bias. AI can reproduce or reinforce social prejudices if models are trained on historical data that contains discriminatory patterns. This can lead to discrimination against certain groups of people, which calls into question the fairness of using AI in areas such as employment, lending, or even law enforcement.

As AI already has a major impact on various aspects of our lives, it is important not only to control the technology, but also to create an ethical framework for its development and use. This requires global cooperation, a legislative framework, and the development of new methods for assessing and monitoring the ethics of algorithms to minimize negative consequences for people and society as a whole.

Artificial intelligence opens up new opportunities, but also raises serious ethical questions that require attention at all stages of its development and application. One important aspect is the responsibility for the actions of AI. In situations where AI takes over decision-making (such as in medicine, law, or even military technology), the question arises of who is responsible for potential errors or negative consequences. This challenges the traditional concept of liability, as machines cannot be held legally liable like humans.

Other important food means an influx of food into the labor market. Automation and robots based on HI can replace the singing professions that promote social justice. How to provide people whose jobs can be automated with new opportunities for practice? This is due to the interaction between technology and social structures, which requires the creation of support mechanisms, redirecting and ensuring a good standard of living for everyone. Nowadays, it is important to recognize cultural and social differences in stagnant technologies. For example, those that are socially acceptable in one culture or region may be unpleasant in another. Therefore, it is necessary to

elaborate on universal ethical principles, but also in relation to local particularities and context.

There is a growing need for international initiatives for ethical regulation of the world. This may include the creation of global standards, legislative initiatives, as well as platforms for the international exchange of evidence and best practices. The role of the large number of important parties, including government agencies, scientists, enterprises and large-scale organizations, is critically important for the development of ethical norms in the AI sphere [7].

In general, ethics in the world is not an additional aspect, but an invisible part of its development, in order to ensure a harmonious balance between technological achievements and human values.

Piece intelligence has great potential for improving the quality of life, but its development is not responsible for the protection of human rights and ethics. As technology continues to become increasingly disruptive, it is important to create ethical standards to ensure a balance between innovation and social values that avoid their harm and harm to people.

As a guide to our research, please note that topic AI is a fundamentally new development in science. We can confidently state the fact that the development of the upcoming tying industry is shoulder-to-shoulder with technology. However, it should be noted that without regulatory standards can cause a number of regressive consequences for marriage. Ethical calls, associated with the development of individual intelligence, require serious respect and an integrated approach to their achievement. The balance between technological progress and moral principles, as well as the creation of ethical standards for the culture of the world, is an important step in this direction. Only by maintaining ethical standards can we guarantee that we serve the good of the marriage and do not pose a threat. In general, Ukraine has great potential for the development of technology, and this sector will continue to grow as a friendly environment for innovation, highly qualified personnel and strong scientific bases.

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