STUDIA UBB. PHILOSOPHIA, Vol. 68 (2023), 1, pp. 161-173
(RECOMMENDED CITATION)
DOI:10.24193/subbphil.2023.1.10

ETHICAL ASPECTS OF ARTIFICIAL INTELLIGENCE FUNCTIONING IN THE XXI CENTURY

Vira DODONOVA[*], Roman DODONOV[**], Kateryna GORBENKO[***]

ABSTRACT. The article is devoted to the ethical aspects of artificial intelligence functioning. The problem of the safe coexistence of man and artificial intelligence is taking on increasing importance. The definition of artificial intelligence and the explanation of the difference between weak, strong artificial intelligence and super-intelligence are given. The first ethical problem of artificial intelligence functioning is the existential question of human redundancy due to the spread of artificial intelligence. The article emphasizes that artificial intelligence, on the one hand, frees a person from certain areas of activity, facilitating their existence, on the other hand, it makes them superfluous in production and in personal life. The second is the problem of responsibility for the actions of artificial intelligence. The article argues for the necessity of human responsibility for the actions of artificial intelligence because artificial intelligence does not have consciousness. The third problem is the intensification of the phenomenon of stupidity in society. Artificial intelligence creates the conditions for the increasing cleverness of some segments of the population and stupidity of others, which can result in even greater mental and property inequality.

Key words: intelligence, artificial intelligence, ethics, responsibility, legal responsibility, human existential state, problem of redundancy, stupidity.

[*] Dr. hab., prof., National University of Life and Environmental Sciences of Ukraine, 15 Heroiv Oborony Str., Kyiv, Ukraine. Phone: +380662995636. Email: dodonovav@gmail.com. https://orcid.org/0000-0002-4282-5495

[**] Dr. hab., prof., Borys Grinchenko Kyiv University, 13b Levko Lukyanenko Str., Kyiv, Ukraine. Phone: +380662995616. Email: r.dodonov@kubg.edu.ua. https://orcid.org/0000-0003-1598-499X

[***] Dr., Volodymyr Dahl East Ukrainian National University, 11/82, Vasylivska Str., Slavyansk, Ukraine. Phone: +380995326662. Email: gorbenkokaterina47@gmail.com. https://orcid.org/0000-0002-3106-5320

Introduction

The problem of the sustainable existence of humanity is becoming increasingly important in the XXI century. We are currently experiencing the COVID-19 pandemic that has claimed millions of lives on the planet, representing biological danger. The ecological crisis is no less acute. In addition to these two topical issues, humanity should not forget about the technological hazards, one of the varieties of which is the uncontrolled functioning of artificial intelligence. Today the world needs a philosophical reflection on the problem of the possibility of simulating human thinking by artificial intelligence systems and assessing the risks of implementing appropriate technologies in the present and future of humanity.

It should be noted that artificial intelligence was conceived as a way to replace humans in difficult situations, such as armed hostilities, police operations, space exploration, unmanned vehicle driving. It has proved effective in medicine, namely in processing ultrasound, computer tomography and magnetic resonance imaging data, drug testing, and mastering all available health care information. Also, it seems very suitable for those areas of human activity in which man cannot compete with new technology: fast and efficient processing of large amounts of information, perception and processing of all signals of the outside world, etc. According to O. Radutny, "artificial intelligence was designed as man's great assistant that could offer a perfect solution in a particular field of human activity" (Radutny, O.E., 2021).

Despite the positive contribution of artificial intelligence to society, today a few risk factors of the existence of this phenomenon could be identified: digital, physical and political. The digital factor includes an automated phishing system or the creation of fake emails, websites, and links for stealing information; the physical one comprises the automation of terrorism with the help of commercial drones or autonomous vehicles as weapons; the political factor refers to propaganda through creating fake images and videos, censorship through carrying out automated search and deletion of texts and images (Franasyuk, Yu., 2018).

As it is known, skeptics' philosophical credo is to refrain from evaluative judgments. In the XXI century, it does not lose its relevance as these judgments are aimed at complex phenomena of social reality, which cannot be unambiguously assessed in the polar categories of good and evil. To minimize the negative technogenic impacts it is necessary to develop and implement ethical and legal standards for the usage of artificial intelligence.

Thus, the **purpose** of this article is to analyze ethical aspects of artificial intelligence functioning.

Degree of studying the problem

The problem of artificial intelligence was examined by D. Barrat, E. Horwitz, N. Bostrom, E. Musk, D. Dyson, J. McCarthy, M. Minsky, P. Norvig, J. Searle, S. Russell, K. Kelly, R. Kahlo, P. Asaro, W. Wingham, A. Turing and others. Social, ethical and legal aspects of artificial intelligence functioning were studied by O. Baranov, V. Bryzhko, M. Karchevsky, O. Dobrovolska, V. Myslyv, V. Pylypchuk, N. Savinova, Ye. Kharytonov, Yu. Petrunin, A. Makovkin, M. Ryazanov, A. Savelyev, V. Shtanko, I. Tsidilo, Y. Karpenko, O. Radutny, Yu. Harari, M. Taddeo, L. Perry, K. Wakefield.

Methods

The methodological basis of the research is made up of the findings of representatives of analytical philosophy, such as D. Armstrong, J. Searle, D. Chalmers, D. Dennett, raising the issue of the interrelation between mental (consciousness) and physical (material), the ratio of consciousness and brain. Considering the problem of the interrelation between intelligence and consciousness, J. Searle believes that the creation of a computer program itself will never be a sufficient condition for the presence of intentionality: “mental states are determined by their causal roles, not by the stuff (neurons, transistors) that plays those roles” (Searle, J., 1980). The human mind is endowed with semantics, the machine, instead, perceives information through combinations of symbols (ones and zeros) without understanding these symbols, therefore it is impossible to talk about the presence of semantics, and hence consciousness. Thus, the overarching methodological guideline is the idea of the impossibility of endowing artificial intelligence with autonomous consciousness. This principle was followed by O. Dobrovolska and I. Shtanko (“Philosophical Analysis of the Evolution of Artificial Intelligence”), Yu. Karpenko (“Ethical Principles of Artificial Intelligence Application in Public Administration”), A. Makovkin (“Ethical Problems of Artificial Intelligence”). The authors emphasize the following philosophical problems of artificial intelligence functioning: the limitations of the computational approach, the inability of artificial intelligence to demonstrate self-reflection, sensations, creativity, and flexible behavior (Dobrovolska, O., Shtanko, I., 2019). That leads us to the suggestion that man should be responsible for artificial intelligence acts.

Results and Discussion

Definitions and classification of artificial intelligence

To figure out the stated problem, it is necessary to understand what artificial intelligence is and to follow the discourse of defining this concept. This term was proposed by the American professor John McCarthy, who first proclaimed it in 1956 by defining it "…as the science of creating intelligent machines and intelligent computer programs" (Moor, J., 2006), which became the starting point for the study of artificial intelligence.

The basic classification of all the aspects of this term was proposed by Yu. Petrunin: "1. a research area, which aims to simulate the processes of cognition and thinking, the use of methods of solving problems applied by man to increase the productivity of computer technology; 2. various devices, mechanisms and programs, which can be called intelligent according to certain criteria; 3. a set of ideas about cognition, mind and human being, which make it possible to pose the question of simulating intelligence" (Petrunin, Yu., 2018). S. Russell and P. Norvig in their book "Artificial Intelligence: Modern Approaches" classify it as follows: "a system that thinks like humans (e.g., cognitive architecture and neural networks), a system that acts like humans (e.g., the Turing test through natural processing language, knowledge representation, automated thinking and learning), a system that thinks rationally (including logical algorithms, inference and optimization), a system that acts rationally (e.g. intelligent software agent, creation of robots achieving goals through perception, planning, reflection, study, communication, decision-making and action)" (Stuart, Russell and Peter, Norvig, 2021).

On December 2, 2020, the Cabinet of Ministers of Ukraine approved the order on "Concept of Artificial Intelligence Development in Ukraine", providing its vision of the term: "Artificial intelligence is an organized set of informational technologies, which makes it possible to perform complex tasks by using a system of research methods and algorithms for processing information obtained or independently created during work, as well as to create and use own knowledge bases, decision-making models, information processing algorithms and determine ways to achieve tasks" (On approving the Concept of Artificial Intelligence Development in Ukraine: Order of the Cabinet of Ministers of Ukraine № 1556-p of December 2, 2020. The Verkhovna Rada of Ukraine).

Thus, we can metaphorically say that artificial intelligence is non-human intelligence that has to solve human problems.

That is why, referring to the ethical problems of artificial intelligence functioning is justified, as it is caused by human fears about the safe coexistence of man and technology. The history of humanity demonstrates that any results of scientific and technological progress can be used both with progressive and destructive intentions; the simplest example of the negative impact of artificial intelligence on human existence is cybercrime.

Surprisingly, fears about the dangerous existence of artificial intelligence are formed under the influence of fantasy films and books where the world is captivated by human-like robots and where man is in a secondary place. Fantasies on this topic may be the most unexpected, but let us turn to a scientific analysis of the problem.

Research on ethical issues is divided according to the level of capabilities of artificial intelligence. The philosophy of artificial intelligence distinguishes the following types: strong, weak, superintelligence. Notably, "weak artificial intelligence is a tool that allows you to solve certain problems that do not require a full range of human cognitive abilities" (Makovkin, A.S., 2015). It is implemented in an expert system which is a program that replaces an expert in a particular field of knowledge or activities. (An example is the MYCIN program, which could be a physician's assistant and which is aimed at treating blood infections. "MYCIN attempts to diagnose patients based on reported symptoms and medical test results". It can request additional information about the patient and suggest more medical testing; such information will help the program to arrive at a possible diagnosis and to suggest a treatment).

Strong artificial intelligence is a powerful computer similar to the human mind. "Strong artificial intelligence is a computer that is programmed in such a way that it can be in any human cognitive state" (Cole, David, 2020).

The highest level in the development of artificial intelligence is considered to be super-intelligence, which can "think, reason, solve puzzles, make judgments, manage, plan, learn and communicate independently (Types of Artificial)". Strong intelligence and super-intelligence are very similar, but the difference is that the former performs mental activity as a person while the latter exceeds the acts of its creator (Karchevsky, M., 2017). Therefore, according to their capabilities, ethical issues are distinguished.

The existential question of human redundancy due to the proliferation of artificial intelligence

The introduction of artificial intelligence in the industry, agriculture, transport, military affairs, space and ocean exploration, health care, education, etc. is expected to reduce the number of living people previously employed in these areas. Automation of production is currently contributing to rising unemployment, and the introduction of artificial intelligence can permanently exclude people from the technological process.

Today we can observe the embodiment of artificial intelligence in everyday life. World-famous Elon Musk, citing examples of artificial intelligence application, believes that the future lies in unmanned vehicles, which will replace conventional cars with drivers. In Japan, there are eating establishments served by robots. There are cleaning robots (women will adore them) as well as police robots that help to maintain public order, and so on. In today's infosphere and digital space, robots can be called real "natives", an integral part of the cyber environment (Floridi, L., 2021).

Naturally, the following question arises: does artificial intelligence possess more advantages or disadvantages by depriving a person of their job and earnings? On the one hand, competition with "smart machines" promotes individual's creative self-fulfillment and overcoming laziness, which becomes an impetus for harnessing other areas of activity and self-improvement. Economists argue that automation of production with the help of machines increases the number of jobs rather than decreases. Artificial intelligence application leads to the emergence of more highly paid and interesting specialties.

On the other hand, technological progress is indeed capable of leaving man "on the sidelines of history". A person gets a lot of free time. What should they fill it with? Where should they apply their abilities? Both scientists and average people are concerned with these questions.

The ethical facet of this issue foregrounds the problem of redundancy, replacing a person with artificial intelligence, when they firstly feel unnecessary in production, and then – in their own life. In this situation, we can talk about an existential facet of the problem, when a person is alienated from the labor process. Recalling Hryhoriy Skovoroda's concept of "immanent work", according to which man's vocation to a particular activity is laid by nature-God at the moment of birth, and therefore "man must be happy doing immanent work", we can assume that replacing man with artificial intelligence is a great ethical and social problem.

The problem of human responsibility for the consequences of artificial intelligence functioning

In our opinion, the problem of responsibility should be divided into two aspects. The first one refers to the question: who will be responsible for the mistakes made by nootechnology: the creator or artificial intelligence itself? The second aspect is the responsibility for human self-development in the conditions of spreading the activity of artificial intelligence.

The question of responsibility is directly related to the aspects of the control and decision-making that (Spence, E., 2021). A. Makovkin believes that at the current stage of development of artificial intelligence and society "… responsibility cannot be transferred from the specialist to the machine, but if computer systems positively make more accurate decisions than humans, in this case, the specialist's role will be levelled and the expert system will approach strong artificial intelligence, the use of which is associated with several completely different ethical issues" (Makovkin, A., 2015). J. Searle states that "according to weak artificial intelligence, the main importance of the computer in studying the mind is that it gives us a very powerful tool. For example, it allows us to formulate and test hypotheses more rigorously and accurately. But, according to strong artificial intelligence, the computer is not merely a tool for studying the mind; rather the properly programmed computer is a mind, in the sense that computers given the right programs can be literally said to understand and have other cognitive states" (Searle, J., 1980).

Naturally, the question arises: if we can create artificial intelligence that surpasses our own, then how will the relationship between people and machines develop? Fantastic stories make a frightening suggestion that artificial intelligence can surpass us in abilities and turn from an assistant to an enemy. Science fiction writers predict the end of the era of humans and the beginning of the era of super-intelligent machines. Perhaps strong artificial intelligence is the last man's creation. The author of this theory is the famous mathematician and science fiction writer Vernor Vinge. He calls it a technological advantage, noting that the creation of super-intelligent machines will mark the end of the era of humans. However, not everyone shares the science fiction writer's pessimistic offering options on how to prevent such a scenario. American futurist Eliezer Yudkowsky offers his version of the development of artificial intelligence, namely the concept of friendly intelligence, the essence of which is "to create artificial intelligence that will have a positive rather than negative impact on humanity" (Makovkin, A., 2015).

Isaac Azimov proposes “the three laws of robotics”, which present the ethical principles of robot operation: “A robot may not injure a human being, or, through inaction, allow a human being to come to harm. A robot must obey the orders given it by human beings except where such orders would conflict with the First Law. A robot must protect its own existence so long as such protection does not conflict with the First or Second Laws” (Levchuk, A., 2015). For robotics, these laws are still relevant today, although they were presented in 1942.

Stephen Hawking also spoke about the danger of intelligent machines, saying: “The development of full artificial intelligence could mean the end of the human race” (Stephen Hawking warns artificial intelligence could end mankind, 2019). Elon Musk, also negatively, called the creation of artificial intelligence “our greatest existential threat”. Although, it’s strange to hear it from the man who creates drones and believes that the future lies with them. An example of the uncontrollability of strong intelligence is robot “Sophia”, who in an interview in 2016 answered the question “Do you want to destroy people? Please say “no” with “Okay, I will destroy humanity”. She may have made a bad joke, or should we start worrying about it?

Researchers believe that the creation of ethical artificial intelligence is a prerequisite for creating super-intelligence. That is, it is a combination “…between formal mathematical systems and ethical principles” (Karpenko, Yu., 2019).

Scientists are most concerned about the safe existence of artificial intelligence in society. Thus, L. Perry believes that “the ultimate goal of the security of artificial intelligence is to create useful, not artificially directed intelligence”. Therefore, “what is useful remains an open question that is to some extent correlated by ethics”. Thus, “it is necessary to develop a philosophy or ethics of using artificial intelligence as soon as possible” (Karpenko, Yu.V, 2019). However, this ethics usually lies in the area of formal responsibility rather than morality, being focused on answering the question “Who should be blamed”, but not “How should the society form the proper attitude toward the development and further practical use of AIs, especially autonomous ones?” (Bartneck, C., et al., 2021).

Both global computer makers (Baranov, O.A., 2017; OECD Principles on AI, 2019) and religious organizations are expressing concern about the responsibility for artificial intelligence actions. For example, in 2020, “Bosch” company presented the “Code of Ethics for Artificial Intelligence”. This code is based on a single principle: man should monitor the decisions of artificial intelligence. “Artificial intelligence serves people. Our code of ethics for artificial intelligence gives employees clear instructions on how to develop smart products. We want people to trust our products based on artificial intelligence” (AI Code of Ethics: Bosch sets out the principles for working with artificial intelligence, 2020).

The Catholic Church has also offered several ethical warnings about the extensive usage of artificial intelligence. Thus, the Vatican discussed the ethical principles of artificial intelligence operation and development with two giants – Microsoft and IBM. All agreed that the artificial intelligence pillars should: "respect privacy, work in a robust and impartial way, respect human rights and act transparently" (Vatican joins IBM, Microsoft to call for facial recognition regulation, 2020).

Regarding the second aspect of the problem of responsibility for human self-development in the context of the extensive usage of artificial intelligence, it is necessary to take into account the factor of manipulating minds, which must be worthily resisted. In the information and high-tech spheres, this means, in particular, the necessary to: "1) make efforts to continuously improve one's literacy and education in the field of new technologies; 2) be aware at least in general terms of the current achievements of scientific and technological progress and use them in their activities; 3) check important information in several alternative sources; 4) be able to work with "information noise" – unnecessary, redundant, or untimely information that interferes with the perception of the useful one; 5) distinguish unintentional mistakes and reservations from intentional methods (propaganda, manipulative technologies, commercialization, etc.); 6) cultivate respect for oneself and the country; foster self-confidence; 7) be responsible for the dissemination of information; 8) think critically, be independent minded, etc" (Radutny, O.E., 2021). The area of AI development now is not just an engineering discipline; it is rather transdisciplinary. Therefore, not only wide general knowledge, but also proper professional education is important to form the responsible attitude toward the issues concerning the artificial intelligence (Dignum, V., 2020).

The problem of potential human degradation due to the spread of artificial intelligence

Another risk that researchers are paying attention to is the problem of "increasing human stupidity". According to the Polish philosopher Jacek Dobrowolski, "stupidity is a set of phenomena of anthropogenic nature with manifestations of dysfunction or distortion of understanding" (Dobrowolski, J., 2014).

The paradox is that artificial intelligence should stimulate human mental activity, promote the fulfillment of human abilities. Instead, it provokes mental inactivity in many ordinary people, which leads to the formation of mass stupidity.

"The danger is that if we invest too many resources in the development of artificial intelligence and too little in the development of human consciousness, too sophisticated artificial intelligence computers will only exacerbate people's natural stupidity" (Harari, Yu., 2018). No matter how much we cultivate the myth of equal opportunities, the society is increasingly stratified and divided into rich and poor. The rich will have the resources and improve their abilities, and the poor will lead a miserable life and blunt more and more, becoming primitive. According to Harari, "the development of artificial intelligence can destroy the economic value and political influence of most people, while the development of biotechnology will turn economic inequality into biological one" (Harari, Yu., 2018).

"Two processes – both bioengineering and the development of artificial intelligence – can lead to the division of people into a small class of superhumans and a massive lower class of unnecessary Homo sapiens. The situation is complicated by the fact that as the masses lose their economic importance and political power, the state loses… incentives to invest in human health, education and well-being" (Harari, Yu., 2018). In this way, a whole layer of degraded people will be formed. A degraded person is supposed to misuses perfect computers, destroying themselves and the world around them.

Conclusions

Summing up, it should be noted that artificial intelligence is a product of post-industrial society. Like many other fields of knowledge, the study of artificial intelligence is an interdisciplinary field that has developed at the intersection of computer science, psychology, physiology, philosophy and linguistics. Ethical aspects of artificial intelligence functioning are the focus of axiological priorities of postmodern science. Ethical issues of artificial intelligence are certainly important, but their importance should not be exaggerated. On the one hand, the fantastic stories that are read are only fantastic creations. As Yu. Harari writes, "the plot of almost all films and novels about artificial intelligence revolves around the magical moment when the computer or the robot becomes conscious" (Harari, Yu., 2018). But consciousness and intelligence are not identical phenomena. Intelligence is the ability to solve problems, and consciousness, in addition to intelligence, also contains an emotional component and the ability to self-reflect.

In addition to the problems of redundancy and responsibility, which have been discussed, society faces another problem of artificial intelligence functioning – the intensification of human stupidity. Society puts a lot of effort into the development of

artificial intelligence and very little into the development of human abilities, as a result people are slowly becoming stupid. And this is an important ethical and social issue.

On the other hand, humanity must decently cope with the challenges it faces. It is unwise to bury one's head in the sand, pretending that everything is fine. The relationship between humans and artificial intelligence is the reality that awaits us in the future. Similar to the biosphere which is formed by the interaction of all organisms on the Earth, the noosphere unites all minds that interact with each other. Human beings' wisdom is to tolerate coexistence with artificial intelligence to protect themselves and the world from inhuman thinking and inhuman actions.

REFERENCES

AI Code of Ethics: Bosch Sets Out the Principles for Working with Artificial Intelligence (2020). https://www.bosch.ua/news-and-stories/ai-code-of-ethics/(in Ukrainian).

Baranov, O.A., (2017). The Internet of Things and Artificial Intelligence: The Origins of the Problem of Legal Regulation. *IT law: problems and prospects of development in Ukraine*: Proceedings of the II International Scientific and Practical Conference (Lviv, November 17, 2017). Lviv: Lviv Polytechnic National University, 2017. P. 18-42(in Ukrainian).

Bartneck, C., Lütge, C., Wagner, A., Welsh, S. (2021). Responsibility and Liability in the Case of AI Systems. In: *An Introduction to Ethics in Robotics and AI. SpringerBriefs in Ethics*. Springer, Cham. https://doi.org/10.1007/978-3-030-51110-4_5

Benen, Steve (2020). For 14th straightweek, unemployment filing stop 1 million. MSNBC, June 25, 2020. https:// www.msnbc.com/rachel-maddow-show/14th-straight-week-unemployment-filings-top-1-million-n1232091.

Cole, David (2020). "The Chinese Room Argument". The Stanford Encyclopedia of Philosophy, Edward N. Zalta (ed.), https://plato.stanford.edu/archives/win2020/entries/chinese-room/.

Dignum, V. (2020). Responsibility and artificial intelligence. In: Dubber, M. D., Pasquale, F., & Das, S. (Eds.) *The Oxford handbook of ethics of AI*. pp. 215-231

Dobrovolska, O.V. (2019). Philosophical Analysis of the Artificial Intelligence. *Studies in History and Philosophy of Science and Technology*. Vol. 28, № 1. pp.10-19. http://nbuv.gov.ua/UJRN/studhphst_2019_28_1_4(in Ukrainian).

Dobrovolsky, J. (2014). Philosophy of Stupidity. The Story of What is Irrational. Kharkov: Publishing House "Humanitarian Center". 412 s. (in Russian).

Floridi, L. (2021). Robots, Jobs, Taxes, and Responsibilities. In: Floridi, L. (eds) Ethics, Governance, and Policies in Artificial Intelligence. Philosophical Studies Series, vol 144. Springer, Cham. https://doi.org/10.1007/978-3-030-81907-1_21

Franasyuk, Yu. (2018). Moral and Ethical Aspects of the Introduction of Artificial Intelligence in Today's Globalized World. Socio-cultural and Political Priorities of the Ukrainian Nation in the Context of Globalization. Ternopil: TNEU. pp. 130-132(in Ukrainian).

Harari, Yuval Noah (2018). 21 Lessons for the 21st Century. Random House. 368 p.

Kaku, Michio (2008). Physics of the Impossible: A Scientific Exploration into the World of Phasers, Force Fields, Teleportation, and Time Travel. Doubleday Publishing, Duke University Libraries. 456 p.

Karchevsky, M.V. (2017). The Main Problems of Legal Regulation of Socialization of Artificial Intelligence. *IT Law: Problems and Prospects of Development in Ukraine*: Proceedings of the II International Scientific and Practical Conference (Lviv, November 17, 2017). Lviv: Lviv Polytechnic National University. Pp. 93-99. http://aphd.ua/publication-369 (in Ukrainian).

Karpenko, Yu.V. (2019). Ethical Principles of Application of Artificial Intelligence in Public Administration. *Bulletin of the National Academy of Public Administration under the President of Ukraine*. Series: Public Administration. № 4. pp. 93-97. http://nbuv.gov.ua/UJRN/vnaddy_2019_4_15(in Ukrainian).

Levchuk, A. (2015). Artificial Intelligence: Linguistic Aspects. *Scientific Bulletin of the Lesia Ukrainka East European National University*. Philological sciences. Linguistics. № 4. pp.203-207. http://nbuv.gov.ua/UJRN/Nvvnuflm_2015_4_41 (in Ukrainian).

Makovkin, A. (2015). Ethical Problems of the Use of Artificial Intelligence. Historical, Philosophical, Political and Legal Sciences, Culturology and Art History. *Questions of Theory and Practice*. Tambov: Diploma, № 2-2 (52). pp. 130-132(in Russian).

Moor, J. (2006). The Dartmouth College Artificial Intelligence Conference: The Next Fifty Years. *AI Magazine* – American Association for Artificial Intelligence, vol. 27, no 4, pp. 87-91.

OECD Principles on AI (2019). https://www.oecd.org/going-digital/ai/principles/.

On Approval of the Concept of Development of Artificial Intelligence in Ukraine: Order of the Cabinet of Ministers of Ukraine of December 2, 2020 № 1556-r. https://zakon.rada.gov.ua/laws/show/1556-2020-%D1%80#Text (in Ukrainian).

PetruninYu. (2018). Artificial Intelligence: Is It the Clue to the Future? *Russian Journal of Philosophical Sciences*. No 4. P. 96-113. https://doi.org/10.30727/0235-1188-2018-4-96-113

Radutny, O.E. (2021). Self-development of Personality in the Conditions of Nootechnics. *Problems of Personal Self-development in Modern Society*: Proceedings of the II International Scientific and Practical Conference, March 26-27, 2021 Kharkov. Pp. 102-104 (in Ukrainian).

Rozin, V.M. (2015). Thinking: Essence and Development. The Concept of Thinking. The Role of a Thinking Person. Cycles of Thinking Development. Moskow: LENAND. 368 s. (in Russian).

Searle, J. (1980). Minds, brains, and programs. *Behavioral and Brain Sciences*, 3(3), 417-424. https://et3r.ektf.hu/wp-content/uploads/2014/06/minds-brains-and-programs.pdf.

Spence, E. H. (2021). *Stoic philosophy and the control problem of AI technology: caught in the Web*. Rowman & Littlefield. 248 p.

Stephen Hawking warns artificial intelligence could end mankind. By Rory Cellan-Jones (2019). https://www.bbc.com/news/technology-30290540.

Stuart, Russell and Peter, Norvig (2021). Artificial Intelligence: A Modern Approach. Pearson; 4th edition. 2120 p.

Vatican joins IBM, Microsoft to call for facial recognition regulation (2020). https://www.reuters.com/article/us-vatican-artificial-intelligence/pope-to-endorse-principles-on-ai-ethics-with-microsoft-ibm-idUSKCN20M0Z1