Legal Aspects of the Use of Artificial Intelligence in the Implementation of the uSpace Geocosmic Program

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This work is the first attempt in domestic and foreign legal doctrine to comprehend and systematically analyze the use of artificial intelligence (AI) in the implementation of the uSpace geocosmic program. The research methodology includes the use of general scientific, interdisciplinary and special legal methods. This explains the relevance of the topic, its scientific significance, novelty and the author's approach. The theoretical and legal aspects of AI have been reviewed, and possible ways of using it during the implementation of the uSpace program have been disclosed. A comparative legal analysis of the current trends in the legal regulation of AI at the international level has been carried out. The most serious problematic issues of using AI in the light of public and private law have been identified, and prospective ways to resolve them have been shown. The formulated conclusions and proposals are aimed at innovative regulation of social relations that mediate the use of AI in the implementation of the uSpace program, and serve as the basis for further scientific research of a special orientation.

Introduction

As is rightly noted in the literature, the development and industrialization of near space by rockets is largely futile. This is explained by a number of scientifically substantiated facts, among which are the extremely expensive nature of rocket launches and the low transport productivity of the modern global rocket and space industry. An important factor is also the presence of very obvious cause-and-effect relationships between inefficient rocket astronautics and the emergence of global environmental problems, such as the destruction of the ozone layer, environmental pollution, adverse changes in the physical parameters and chemical composition of the atmosphere, the occurrence of ionospheric turbulence, etc. [1]. The way out of this situation seems to be the use of alternative methods of industrialization of near space, which are distinguished by improved characteristics in the field of productivity, safety and ecology. From the point of view of both theoretical and applied science, it is necessary to recognize the solutions and methods developed within the framework of the uSpace geocosmic program as the most fundamental and justified way of alternative space exploration.

This program includes many components, which we will discuss below. An unquestionable advantage in terms of its implementation is the introduction of artificial intelligence systems in various spheres of public relations, which is reflected in the studies of national and foreign authors [2–7]. The use of artificial intelligence (AI) entails many systemic problems. Among them are problems of law that are closely related to cognitive science, neuroscience, philosophy, ethics, morality, virtue, information and public security, as well as a number of other complex and interdisciplinary areas.

Noting the unquestionable importance of introducing the issues of using AI in the above studies, including those published in the collections of articles of the conference on non-rocket space industrialization [8, 9], it should be said that this topic was not the central link of scientific research. AI is often mentioned fragmentarily by the authors in the context of the general direction of scientific activity, and the issues related to it are mostly descriptive or explanatory. It is worth noting the absence of interdisciplinary works reflecting a systematic approach to the use of AI in the solutions and methods offered by the uSpace program, as well as the absence of doctrinal studies on the legal aspects of its application.

Below are the results of a scientific study of the legal aspects of the use of AI in the implementation of the uSpace program in the context of the identified issues, and possible options for overcoming the most significant gaps in the legal doctrine associated with the use of AI technologies have been proposed.

Theory of Artificial Intelligence

The Concept of Intelligence and Cognitive Functions

When studying the "artificial intelligence" concept, it is first necessary to understand what is meant by intelligence. With regard to the word "intelligence" there is no terminological unity, which is due to the interdisciplinary nature of this concept, its connection with many areas of human knowledge – philosophy, science, psychology, etc. The term "intelligence", as well as a number of others, such as "consciousness", "psyche", "mind", "reason", is extremely difficult for a person to understand and evaluate. This is largely determined by the fact that the subject and object of research here coincide in one person, the intelligence studies and analyzes itself, which is an insoluble philosophical and scientific problem. At the same time, for the present it is obvious that for its solution it is required to reach a new qualitative, not quantitative level. That is, progressive and non-standard scientific methods should be the basis, and not an increase in the accuracy of measuring instruments.

Nevertheless, the concept of intelligence can be found in doctrinal sources. So, Encyclopaedia Britannica defines human intelligence as "mental quality that consists of the abilities to learn from experience, adapt to new situations, understand and handle abstract concepts, and use knowledge to manipulate one's environment" [10]. The Great Russian Encyclopedia interprets intelligence as a general cognitive ability, which manifests itself in how a person perceives, understands, explains and predicts what is happening, what decisions he makes and how effectively he acts (primarily in new, complex or unusual situations) [11].

Man, being a creature with a developed intelligence, has a number of cognitive (higher mental) functions, which include perception, imagination, memory, thinking, speech, spatial orientation, understanding, calculation, learning (self-learning), reasoning, etc. The human intelligence also has a creative function, i.e., the ability to create something new that did not exist before (creativity).

The Concept of Artificial Intelligence

There are different representations of the "artificial intelligence" concept. It can be interpreted as a software and hardware complex (an artificial intelligence system); property inherent in an artificial intelligence system; technology group;

282

Collection of Articles of the V International Scientific and Technical Conference
"NON-ROCKET NEAR SPACE INDUSTRIALIZATION: PROBLEMS, IDEAS, PROJECTS"

scientific field. The said terminological apparatus is systematically presented in Figure 1.

Based on these data, we can conclude that AI is primarily a property of an intelligent system, just as intelligence is a property of the human psyche. The fundamental goal of AI is to mimic the human cognitive functions we listed earlier at a level comparable to or above that of a human. AI is often identified with an artificial intelligence system, which is a software and hardware complex based on AI technology (computer vision, intelligent decision support, etc.).

Artificial Intelligence and Artificial Consciousness

One of the key philosophical problems of the modern digital society is, of course, the issue of strong and weak AI. The postulates underlying the identified problem serve as a kind of reminder of what significant risks the creation of AI entails.

Strong and weak AI is a hypothesis in the philosophy of AI, according to which its individual forms can actually justify and solve problems. The theory of strong AI suggests that computers can acquire the ability to think and be aware of themselves as a person (in particular, to understand their own thoughts), although not necessarily that their thought process will be similar to a human. The theory of weak AI rejects this possibility [14].

These theories correlate with the term "artificial consciousness", which refers to a non-biological, man-made machine that is aware of its own existence [15]. The risks of a machine acquiring artificial consciousness are difficult to predict. They range from a person acquiring a devoted friend to the destruction of all mankind. The key problem in this case is the fact that in cognitive science today there is no real methodology for determining whether a robot has synthetic consciousness, and its development is not expected in the near future. If at some point in time an artificial consciousness arises in a robot, the society may find out about it too late, which will become one of the central problems, including those in legal science.
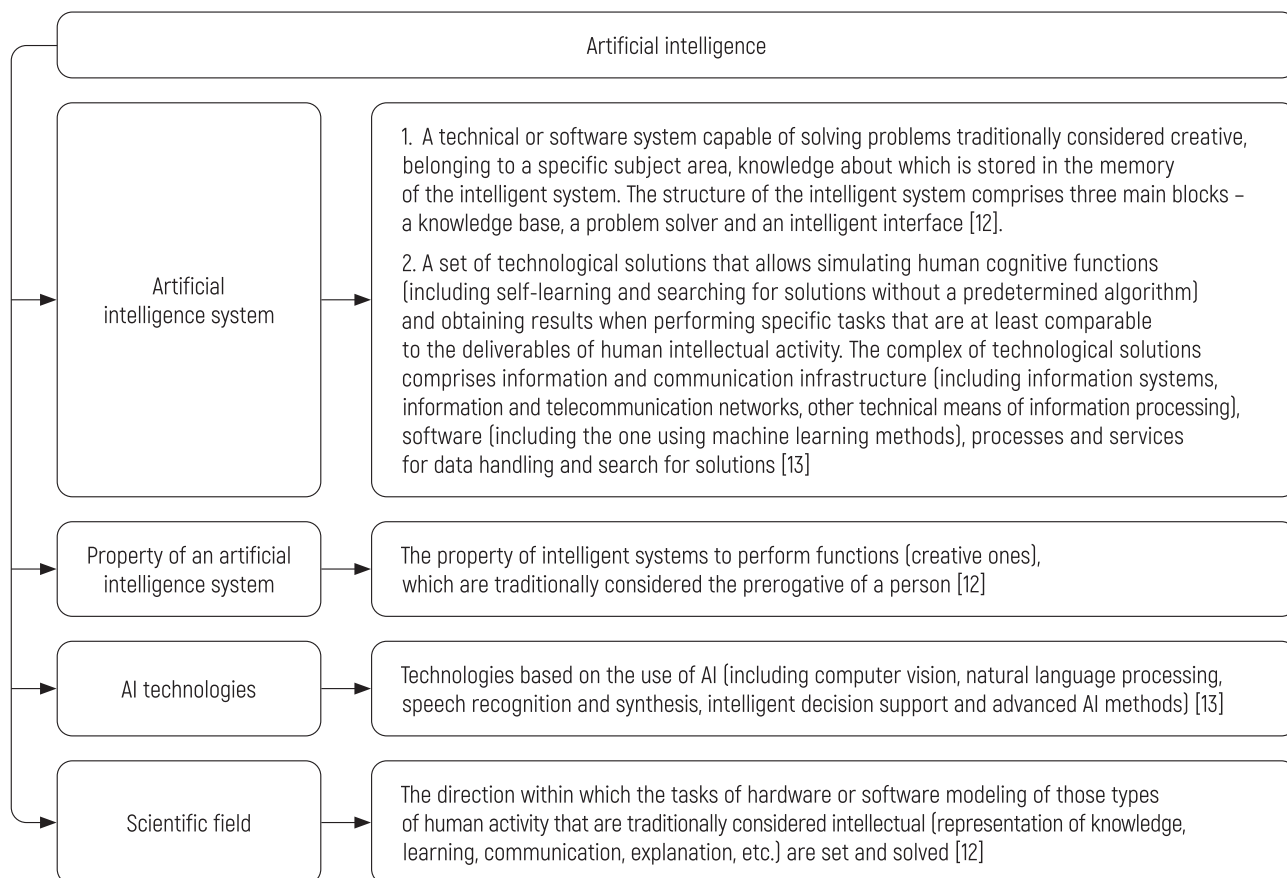

Artificial intelligence	
Artificial intelligence system	1. A technical or software system capable of solving problems traditionally considered creative, belonging to a specific subject area, knowledge about which is stored in the memory of the intelligent system. The structure of the intelligent system comprises three main blocks – a knowledge base, a problem solver and an intelligent interface [12].
	2. A set of technological solutions that allows simulating human cognitive functions (including self-learning and searching for solutions without a predetermined algorithm) and obtaining results when performing specific tasks that are at least comparable to the deliverables of human intellectual activity. The complex of technological solutions comprises information and communication infrastructure (including information systems, information and telecommunication networks, other technical means of information processing), software (including the one using machine learning methods), processes and services for data handling and search for solutions [13]
Property of an artificial intelligence system	The property of intelligent systems to perform functions (creative ones), which are traditionally considered the prerogative of a person [12]
AI technologies	Technologies based on the use of AI (including computer vision, natural language processing, speech recognition and synthesis, intelligent decision support and advanced AI methods) [13]
Scientific field	The direction within which the tasks of hardware or software modeling of those types of human activity that are traditionally considered intellectual (representation of knowledge, learning, communication, explanation, etc.) are set and solved [12]

Figure 1 – Artificial intelligence. Terminological apparatus

**LEGAL ASPECTS OF THE USE OF ARTIFICIAL INTELLIGENCE
IN THE IMPLEMENTATION OF THE uSPACE GEOCOSMIC PROGRAM**
A. Unitsky, M. Gorbunov

283

The Problem of Using Artificial Intelligence

The Problem of Using Artificial Intelligence Through the Prism of Public Law

We will consider the issue of using AI in the public sphere, first of all, using the example of the branch of constitutional law (Figure 2) [16–18].

It is noteworthy that world practice already knows symbolic examples of recognizing AI as possessing the status of a person. So, the world-famous anthropomorphic robot Sophia was awarded the citizenship of Saudi Arabia [19, 20], which is highly ambivalently assessed by representatives of the scientific community and human rights organizations.

The emergence of synthetic consciousness and the potential recognition of AI's status of an "electronic personality" entails significant risks for all of humanity. It is obvious that intelligent systems with artificial consciousness will have their own beliefs, goals and motives that may run counter to the interests of a person, his ideas about morality, virtue, ethics and the place of AI in the system of social relations. We can assume that *Homo sapiens* will not be needed by intelligent systems at all, because, acting as the creator of AI and being the dominant species among living creatures on the planet, it will in many ways limit AI in actions and rights, try to use

it in its own interests, because the main goal of AI is imitation of human cognitive functions for the benefit of society.

In connection with the foregoing, the recognition of AI's status of a person, even symbolic, is premature today. Moreover, such steps, of course, require the prior adoption of certain control and response measures. In the context of the implementation of the uSpace program, the unquestionable importance of AI as a human assistant, but not as a controlling person or manager, is emphasized.

In order to ensure the right to privacy, it is necessary that legislation reflects the restrictions on the creation and use of AI, up to a complete ban on certain technologies related to total surveillance. This approach is currently being actively discussed in the European Union when adopting a Regulation on AI [21].

From the position of criminal law, a number of problems can also be identified (Figure 3).

In the context of the implementation of the uSpace program, the monographic study by I. Mosechkin arouses special interest [22]. Considering ways to improve the protection and regulation of AI in criminal law, the author proposed a fundamentally new approach to the criminal law qualification of illegal acts, the object of which is public relations in the field of traffic safety and transport operation.
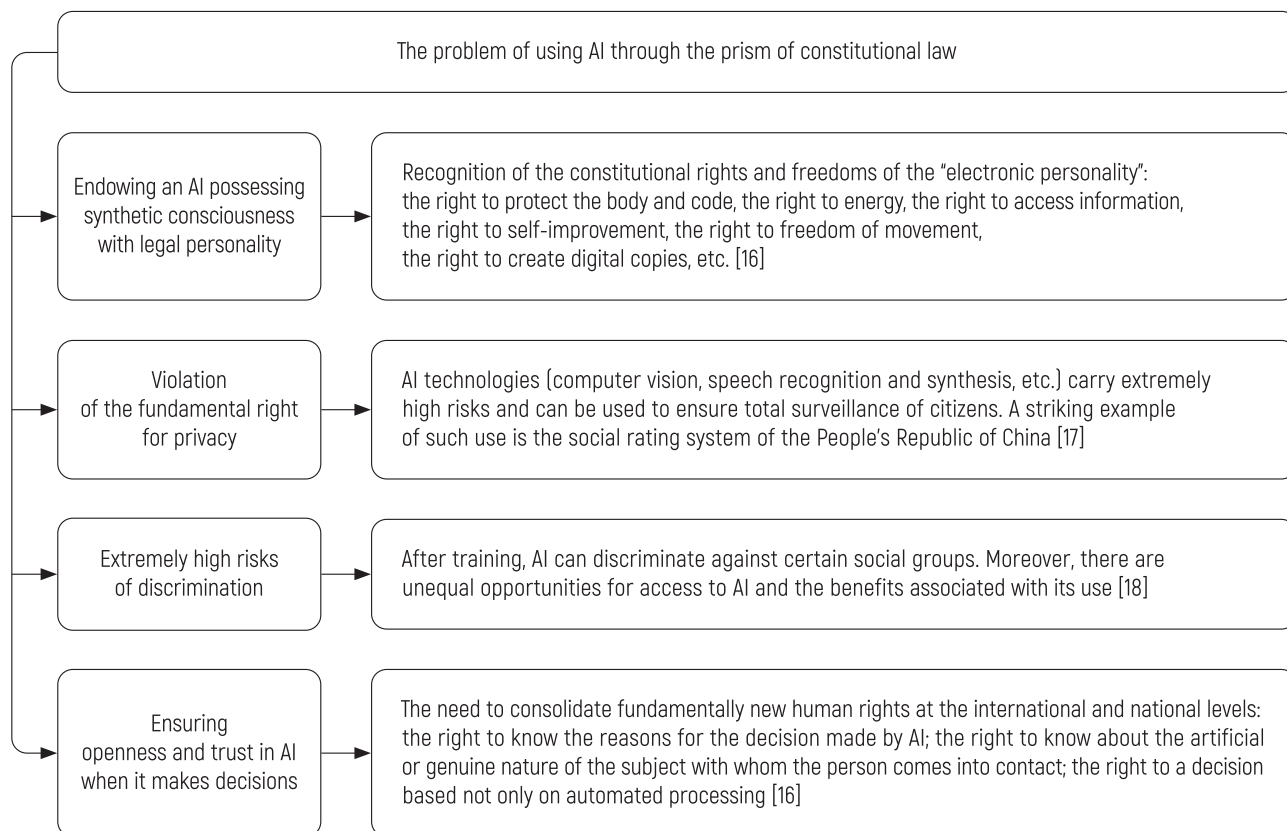
The problem of using AI through the prism of constitutional law

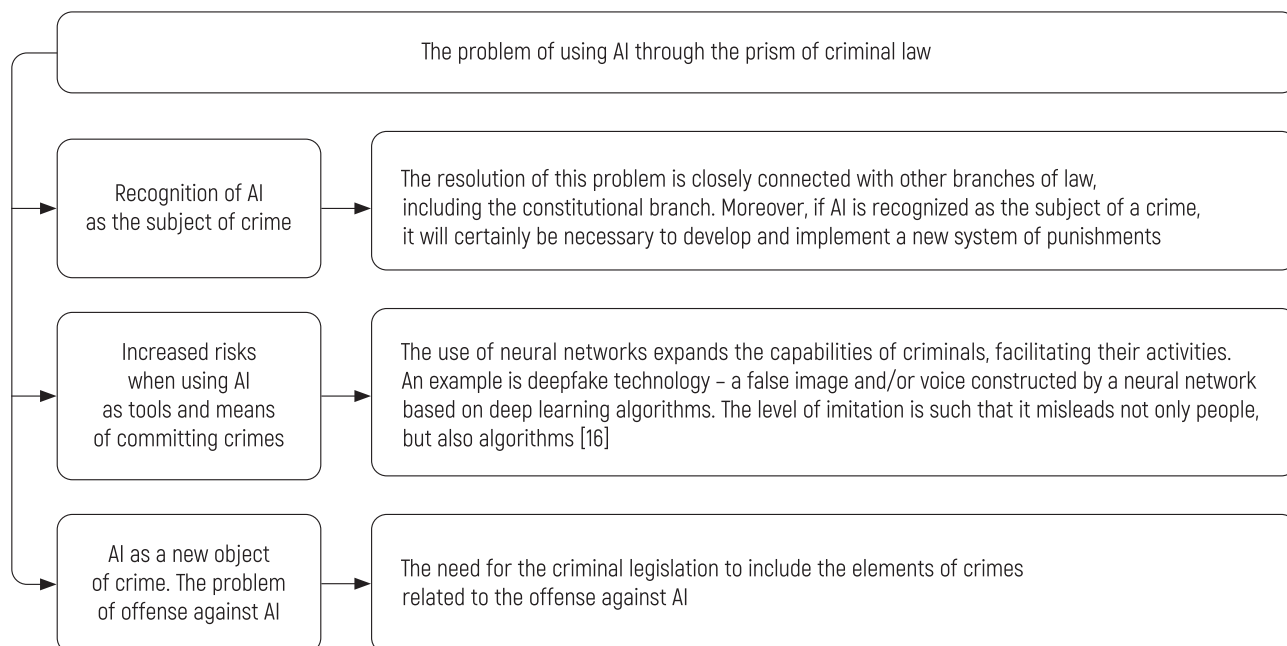| Endowing an AI possessing synthetic consciousness with legal personality | Recognition of the constitutional rights and freedoms of the "electronic personality": the right to protect the body and code, the right to energy, the right to access information, the right to self-improvement, the right to freedom of movement, the right to create digital copies, etc. [16] |

| Violation of the fundamental right for privacy | AI technologies (computer vision, speech recognition and synthesis, etc.) carry extremely high risks and can be used to ensure total surveillance of citizens. A striking example of such use is the social rating system of the People's Republic of China [17] |

| Extremely high risks of discrimination | After training, AI can discriminate against certain social groups. Moreover, there are unequal opportunities for access to AI and the benefits associated with its use [18] |

| Ensuring openness and trust in AI when it makes decisions | The need to consolidate fundamentally new human rights at the international and national levels: the right to know the reasons for the decision made by AI; the right to know about the artificial or genuine nature of the subject with whom the person comes into contact; the right to a decision based not only on automated processing [16] |

Figure 2 – The problem of using AI through the prism of constitutional law

The problem of using AI through the prism of criminal law

| Recognition of AI as the subject of crime | The resolution of this problem is closely connected with other branches of law, including the constitutional branch. Moreover, if AI is recognized as the subject of a crime, it will certainly be necessary to develop and implement a new system of punishments |

| Increased risks when using AI as tools and means of committing crimes | The use of neural networks expands the capabilities of criminals, facilitating their activities. An example is deepfake technology – a false image and/or voice constructed by a neural network based on deep learning algorithms. The level of imitation is such that it misleads not only people, but also algorithms [16] |

| AI as a new object of crime. The problem of offense against AI | The need for the criminal legislation to include the elements of crimes related to the offense against AI |

Figure 3 – The problem of using AI through the prism of criminal law

**LEGAL ASPECTS OF THE USE OF ARTIFICIAL INTELLIGENCE
IN THE IMPLEMENTATION OF THE uSPACE GEOCOSMIC PROGRAM**
A. Unitsky, M. Gorbunov

285

According to I. Mosechkin, it seems expedient to include in the criminal legislation the elements of crimes that commit offence against artificial intelligence systems of unmanned vehicles (UVs). The said elements include the commitment of the following unlawful acts:

• creation, distribution and/or use of computer programs for the purpose of destroying, blocking, modifying or neutralizing the means of protecting the UVs;

• illegal access to software and hardware of UVs;

• violation of the rules for the operation of software and hardware of the UVs or the rules for accessing them, which resulted in damage.

The Problem of Using Artificial Intelligence Through the Prism of Private Law

Let us analyze the problems of AI application in the private sphere using the example of the branches of civil law (Figure 4) and labor law (Figure 5).

From the perspective of labor law, the use of AI technologies also entails many risks (Figure 5).

The development of neuroprosthetics technologies and the creation of hybrid systems – cyborgs, in our opinion,

is a key problem in the doctrine of labor law. This is due to the fact that cyborgs will have significant advantages in being hired, in most cases they will become the most sought-after personnel. In connection with the above, it seems necessary to provide for social guarantees in the legislation for persons who do not have such neuroimplants.

Regulation of Artificial Intelligence at the International Level

Legal Regulation of Artificial Intelligence

The social relations emerging in the digital field are significantly ahead of the processes of their legal regulation – this is a global trend.

To date, there are no international treaties, the subject of which is the regulation of public relations for the creation, implementation and testing of AI. Only separate legal documents have been adopted that are not recognized by international treaties, which form the basis for the future regulation of AI.

Among these acts it is necessary to highlight:

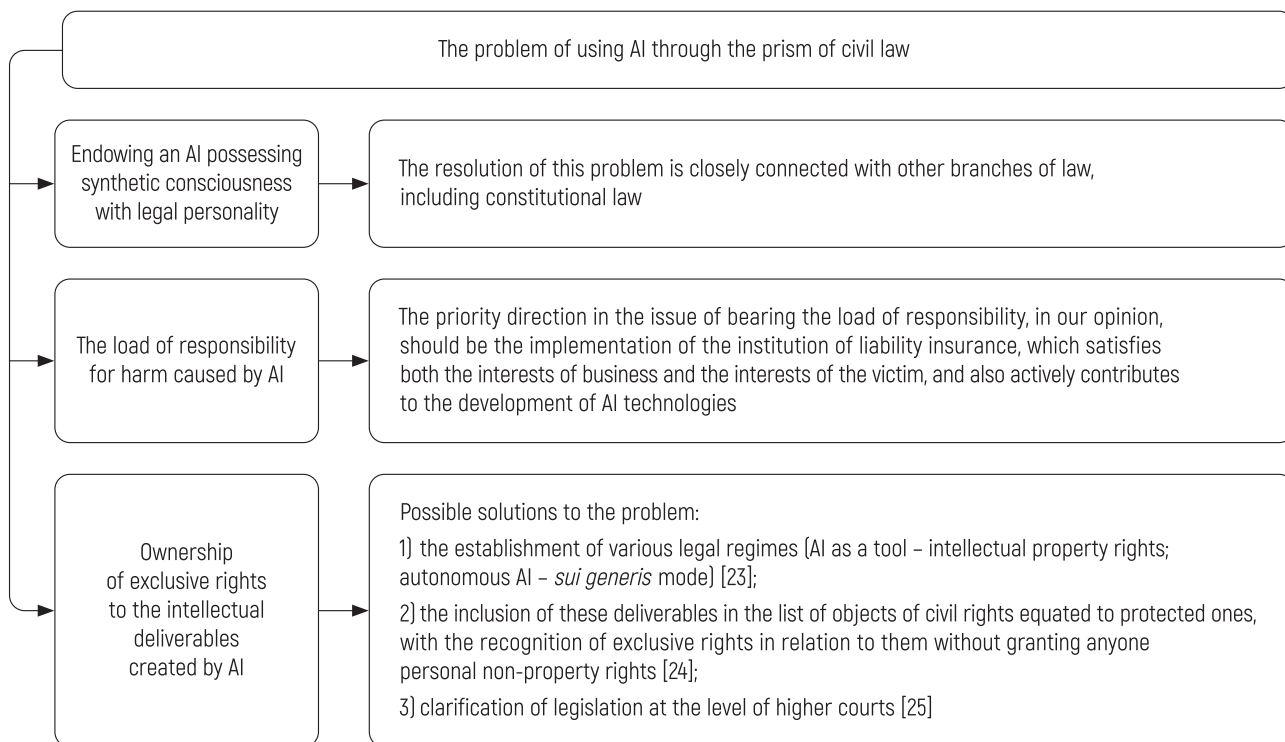1) UNESCO draft Recommendation on the Ethics of Artificial Intelligence, 2021 [26].

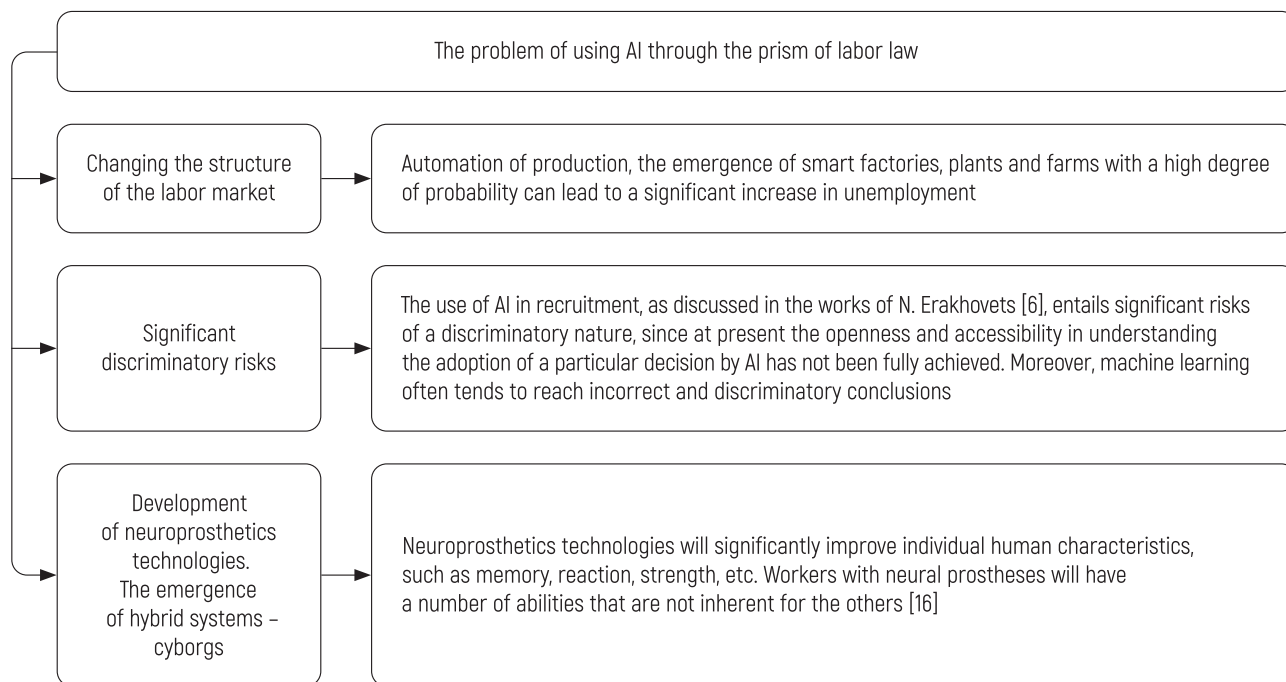Figure 4 – The problem of using AI through the prism of civil law

Figure 5 – The problem of using AI through the prism of labor law

The main goal of developing this document:

• laying the foundation that will allow the use of AI for the benefit of all mankind, the individual, society, the environment and ecosystems and prevent them from being harmed;

• encouraging the use of AI-based systems for peaceful purposes.

The document provides detailed explanations of AI values, such as respect, protection and promotion of human dignity, rights and freedoms of man; well-being of the environment and ecosystems; ensuring diversity and inclusiveness, etc.

This project also reinforces the key principles of activity in the field of AI: proportionality and non-harm; safety and security; fairness and non-discrimination; privacy; transparency and explainability; control and subordination to a person, etc.;

2) Recommendation of the OECD* on Artificial Intelligence, 2019 [27].

The document defines the following principles for the use of AI: inclusive growth, sustainable development and well-being; equity and human-centered values; transparency

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* Organization for Economic Co-operation and Development, founded in 1948, headquartered in Paris.

and explainability; reliability and safety; accountability (responsibility).

This act also provides recommendations for national governments in the field of AI regulation: ensuring long-term public and private investment in research and development of AI; creating a digital ecosystem for AI; creating a favorable political environment for AI; building human capacity and preparing for labor market transformation; developing international cooperation for trustworthy AI.

Thus, the international legal regulation of AI today is represented exclusively by the norms of "soft law", which are advisory in nature. This trend is explained both by the novelty of the subject of legal regulation, and by the desire of each individual state to achieve personal gain without the establishment of strict regulations by the world community. By the way, a similar situation is developing in the field of legal regulation of space exploration, which is reflected in the works of A. Kazakevich [28].

At the same time, a number of the principles described above are declarative. Thus, computer vision systems are used to spy on citizens, which directly violates the principle of privacy, while the principle of transparency and explainability of decision making by AI cannot be fully implemented because AI creators often lose control over its learning process and cannot explain the decisions it makes.

LEGAL ASPECTS OF THE USE OF ARTIFICIAL INTELLIGENCE IN THE IMPLEMENTATION OF THE uSPACE GEOCOSMIC PROGRAM
A. Unitsky, M. Gorbunov

287

Technical Statutory Regulation of Artificial Intelligence

The legal regulation of AI lags far behind the technical one, in which the International Organization for Standardization (ISO) has taken a leading position. Since 2017, Committee on Artificial Intelligence has been functioning in the ISO, which has so far published 11 standards in this area, focused on AI bias, AI decision-making, its reliability, as well as assessing the reliability of neural networks, AI computational approaches, scenarios for its use and big data. The ISO Committee on Artificial Intelligence is developing 27 more standards that will form the basis of future AI projects around the world. These standards can be found on the official ISO website [29].

The diagram of AI regulation at the international level is presented in Figure 6.

Possible Ways of Using Artificial Intelligence in the Implementation of the uSpace Geocosmic Program

The uSpace geocosmic program is a concept of non-rocket exploration of near space using the General Planetary Vehicle (GPV), implementation of which will ensure the preservation of the biosphere by moving the industry (technosphere) outside the planet Earth (beyond the boundaries of the biosphere).

In addition to the GPV, the uSpace program provides for the development and construction of the GPV takeoff and landing overpass (uWay), Equatorial Linear City (ELC), Industrial Space Necklace "Orbit" (ISN "Orbit"), EcoCosmoHouse (ECH).

The uSpace program is an integral part of the EcoSpace program, which is aimed at implementing such eco-oriented areas as Unitsky String Technologies (uST), linear cities (uCities), EcoHouse, uEnergy, uGreen.

Some issues of using AI systems in the implementation of the uSpace program were raised by researchers in papers published at the conferences "Non-Rocket Near Space Industrialization: Problems, Ideas, Projects" [8, 9].

Thus, M. Akbari considers AI as one of the technologies of Industry 4.0, acting as a leading driver of innovation in supply chains for geocosmic systems [5]. N. Yerakhovets suggested using AI as a modern tool for the formation of human capital for the implementation of complex projects with an enclosed social system [6]. The search for a possible integration of a single digital economic model for managing the EcoCosmoHouse object with blockchain, AI and quantum data encryption technologies was declared one of the key areas for further scientific research by a team of authors consisting of A. Unitsky, A. Kushnirenko, A. Kostyuk and E. Kulik [7].

Engineer A. Unitsky in his monograph "Civilization Capacity of the Space Home Named Planet Earth" [2] analyzes the positive and negative aspects of AI as an integral part of the digitalization process of society and economy.
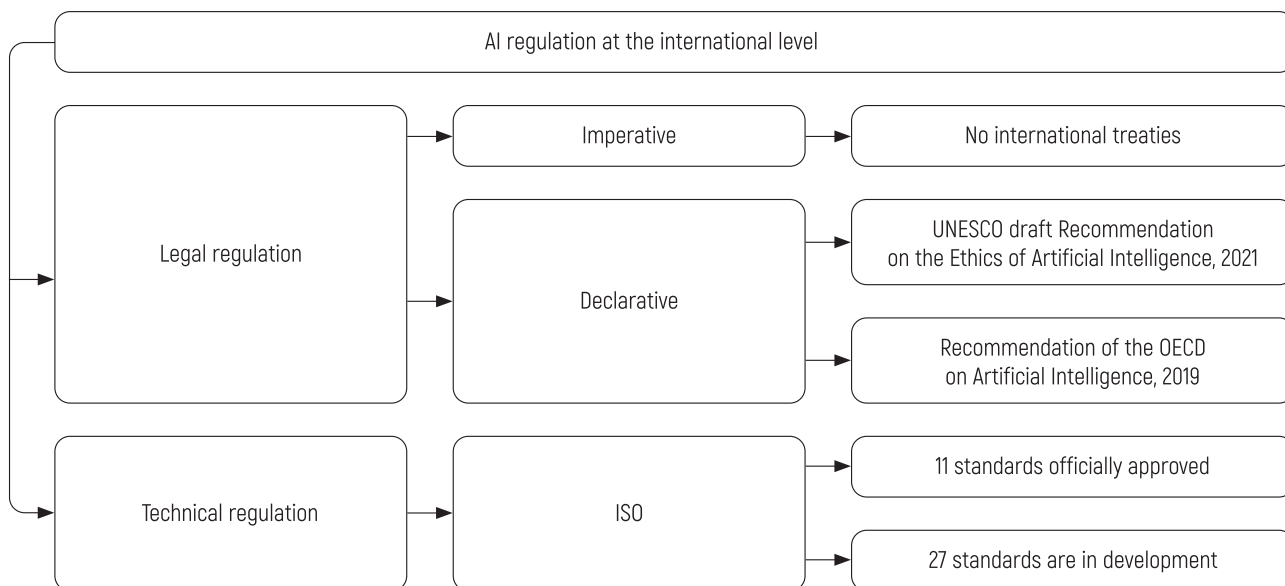

Figure 6 – Diagram of AI regulation at the international level

288

Collection of Articles of the V International Scientific and Technical Conference
**"NON-ROCKET NEAR SPACE INDUSTRIALIZATION:
PROBLEMS, IDEAS, PROJECTS"**

The author points out the crucial importance of the ethical use of intelligent systems in the implementation of the Eco-Space program, in which AI should take the place of an assistant and adviser to a person, but not a controlling body. Moreover, the basic principle of the implementation of the uSpace program is defined: the concepts of "artificial intelligence", "smart city", "smart factory", "smart vehicle" should be based not on the availability of a program code and technical complex, but rather on increased requirements to human security, productivity, environmental protection, etc. Otherwise, AI will purely be a brand, behind which there is no fundamental scientific and technical base.

In our opinion, the use of AI in the context of the uSpace program implementation should become one of the key areas for future research by the authors in accordance with their industry-wise specifics. The authors' solutions presented in the Table below can be used as a basis for special scientific research.

Conclusions and Future Work

The use of AI in the context of the implementation of the uSpace geocosmic program is a key area of research and economic activity. Intelligent systems can be successfully applied in various solutions and methods developed within the framework of the uSpace program, in accordance with their industry specifics (transportation, production, agriculture, construction, etc.). In the course of this study, the theoretical aspects of the implementation of AI have been analyzed, and the ways of its application in the context of the fulfillment of the uSpace program have been outlined.

Table – The use of AI in the context of the uSpace geocosmic program implementation*

Sector of the economy	AI technologies	Applications in uSpace
Transport	Use of UVs and intelligent transport management systems Route building optimization Ensuring vehicle traffic safety and preventing vehicle breakdowns by predicting malfunctions Robotization of logistic hubs and warehouses	Implementation of uST transport solutions: • in uCities; • in the ELC; • within the framework of the uST orbital string-rail roads located at the ISN "Orbit"
Agriculture	Increasing the efficiency of selection processes by taking into account genetic and phenotypic parameters Increasing yields due to the elaborated autonomous crop care system Reducing maintenance and repair costs by predicting equipment breakdowns	Reconstruction of the terrestrial biosphere: flora, fauna, living fertile soil, terrestrial biogeocenoses within the orbital autonomous multifunctional cluster "EcoCosmoHouse" Creation of smart farms, greenhouses and orangeries
Production	Improving the quality and reducing the cost of product designing due to the complex modeling of the parameters of the future product Automation and optimization of production processes and the supply chain by reducing production errors and minimizing the impact of the human factor Effective demand forecasting	Creation of smart industries and factories – TechnoCosmoHouses (TCHs)
Construction	Improving the quality of the construction process by detecting construction errors Modeling and analysis of potential hazards (fire risks, destruction risks, etc.)	Construction: • GPV; • GPV takeoff and landing overpass; • ELC; • multifunctional transport, infrastructure and industrial-residential complex at the ISN "Orbit"

* When describing the possible ways of using AI in the context of the uSpace geocosmic program implementation, the materials of the Roadmap for the Development of "End-to-End" Digital Technology "Neurotechnologies and Artificial Intelligence" were used [30].

LEGAL ASPECTS OF THE USE OF ARTIFICIAL INTELLIGENCE
IN THE IMPLEMENTATION OF THE uSPACE GEOCOSMIC PROGRAM
A. Unitsky, M. Gorbunov

289

When studying the issues of legal regulation of AI at the global level, it was concluded that there are no international treaties in this area, that AI is regulated via "soft law", and that there is a declarative nature and difficult implementation of certain principles and recommendations. As part of the study of the use of AI through the prism of private and public law, a number of legal gaps have been identified, and separate options for overcoming them have been proposed, in particular in the field of intelligent control systems of UVs.

At the same time, the greatest concern in the field of AI is caused by: the emergence of AI's synthetic consciousness and the potential recognition of the AI's status of an "electronic personality"; the emergence in the near future of hybrid systems – cyborgs, which will have significant advantages over people who do not have neuroimplants, which will result in the processes of social stratification and discrimination.

In the context of the implementation of the uSpace program, it is necessary to emphasize the unquestionable importance of using AI as a human assistant, but not as a controlling body or manager. The fundamental principle of fulfilling the uSpace program: the concepts of "artificial intelligence", "smart city", "smart factory", "smart vehicle" should be based not on the fact of the presence of a program code and a technical complex, but rather on increased requirements for human safety, productivity and environmental protection.

It is necessary to specify the following lines of further scientific research within the framework of the problems described in this article: ways to use AI in the implementation of the uSpace program in accordance with industry-wise specifics (biotechnology, engineering, industrial production, energy, agriculture, etc.); industry-wise legal research, the subject of which is the use of intelligent systems in the implementation of the uSpace program; nature of artificial consciousness; legal status of "electronic personality" and the cyborg; regulation of AI at the supranational level, in particular in the European Union; institute of liability insurance in the area in question.

References

1. Unitsky, A. String Transport Systems: On Earth and in Space / A. Unitsky. – Silakrogs: PNB Print, 2019. – 560 p.: il.

2. Unitsky, A.E. Tsivilizatsionnaya yomkost' kosmicheskogo doma po imeni Planeta Zemlya [Civilization Capacity of the Space Home Named Planet Earth] [Electronic resource] / A.E. Unitsky. – Moscow: Mir nauki, 2022. – 136 p. – Mode of access: https://izd-mn.com/PDF/08MNNPM22.pdf?ysclid=la98apfobr284127861. – Date of access: 10.09.2022.

3. Badulin, K. Innovative Business Models of the EcoSpace Program Complex / K. Badulin // Non-Rocket Space Industrialization: Problems, Ideas, Projects: Collection of Articles of the II International Scientific and Technical Conference, Maryina Gorka, Jun. 21, 2019 / Astroengineering Technologies LLC; ed. A. Unitsky. – Minsk: Paradox, 2019. – P. 85–89.

4. Kabanov, E. Blockchain as a Single Information and Economic Basis of the Equatorial Linear City, Its Transport Systems and General Planetary Vehicle / E. Kabanov // Non-Rocket Space Industrialization: Problems, Ideas, Projects: Collection of Articles of the II International Scientific and Technical Conference, Maryina Gorka, Jun. 21, 2019 / Astroengineering Technologies LLC; ed. A. Unitsky. – Minsk: Paradox, 2019. – P. 91–95.

5. Akbari, M. Poyavleniye tekhnologiy Industrii 4.0 kak klyuchevykh drayverov innovatsiy v tsepyakh postavok dlya geokosmicheskikh sistem [Emergence of Industry 4.0 Technologies as Key Drivers of Innovation in Supply Chains for Geocosmic Systems] / M. Akbari // Bezraketnaya industrializatsiya blizhnego kosmosa: problemy, idei, proyekty: Collection of Articles of the III International Scientific and Technical Conference, Maryina Gorka, Sep. 12, 2020 / Astroengineering Technologies LLC, Unitsky String Technologies Inc.; ed. A.E. Unitsky. – Minsk: StroyMediaProyekt, 2021. – P. 246–257.

6. Yerakhovets, N.V. Optimal'naya komandnaya matritsa dlya dostizheniya tseley konkretnogo kollektiva [Optimal Command Matrix to Achieve the Goals of a Particular Team] / N.V. Yerakhovets // Bezraketnaya industrializatsiya blizhnego kosmosa: problemy, idei, proyekty: Collection of Articles of the III International Scientific and Technical Conference, Maryina Gorka, Sep. 12, 2020 / Astroengineering Technologies LLC, Unitsky String Technologies Inc.; ed. A.E. Unitsky. – Minsk: StroyMediaProyekt, 2021. – P. 266–283.

7. Yedinaya tsifrovaya ekonomicheskaya model' dlya upravleniya ob"yektom "EkoKosmoDom na planete Zemlya" [Unified Digital Economic Model for Managing the Object "EcoCosmoHouse on Planet Earth"] / A.E. Unitsky [et al.] // Bezraketnaya industrializatsiya blizhnego kosmosa: problemy, idei, proyekty: Collection of Articles of the III International Scientific and Technical Conference, Maryina Gorka, Sep. 12, 2020 / Astroengineering Technologies LLC, Unitsky String Technologies Inc.; ed. A.E. Unitsky. – Minsk: StroyMediaProyekt, 2021. – P. 360–375.

290

Collection of Articles of the V International Scientific and Technical Conference
"NON-ROCKET NEAR SPACE INDUSTRIALIZATION: PROBLEMS, IDEAS, PROJECTS"

8. *Non-Rocket Space Industrialization: Problems, Ideas, Projects: Collection of Articles of the II International Scientific and Technical Conference, Maryina Gorka, Jun. 21, 2019 / Astroengineering Technologies LLC; ed. A. Unitsky. – Minsk: Paradox, 2019. – 240 p.*

9. *Bezraketnaya industrializatsiya blizhnego kosmosa: problemy, idei, proyekty [Non-Rocket Near Space Industrialization: Problems, Ideas, Projects]: Collection of Articles of the III International Scientific and Technical Conference, Maryina Gorka, Sep. 12, 2020 / Astroengineering Technologies LLC, Unitsky String Technologies Inc.; ed. A.E. Unitsky. – Minsk: StroyMediaProyekt, 2021. – 516 p.*

10. *Human Intelligence [Electronic resource] // Britannica. – Mode of access: https://clck.ru/rcTWa. – Date of access: 22.06.2022.*

11. *Intellekt [Intelligence] [Electronic resource] // Bol'shaya rossiyskaya entsiklopediya. – Mode of access: https://bigenc.ru/c/intellekt-47cb87. – Date of access: 22.06.2022.*

12. *Averkin, A.N. Tolkovyy slovar' po iskusstvennomu intellektu [Explanatory Dictionary of Artificial Intelligence] [Electronic resource] / A.N. Averkin, M.G. Gaaze-Rapoport, D.A. Pospelov. – Mode of access: https://clck.ru/rcTpY. – Date of access: 22.06.2022.*

13. *O provedenii eksperimenta po ustanovleniyu spetsialnogo regulirovaniya v tselyakh sozdaniya neobkhodimykh usloviy dlya razrabotki i vnedreniya tekhnologiy iskusstvennogo intellekta v sub"yekte Rossiyskoy Federatsii – gorode federal'nogo znacheniya Moskve i vnesenii izmeneniy v stat'i 6 i 10 Federal'nogo zakona "O personal'nykh dannykh" [On Conducting an Experiment to Establish Special Regulation in Order to Create the Necessary Conditions for the Development and Implementation of Artificial Intelligence Technologies in the Constituent Entity of the Russian Federation – the City of Federal Significance Moscow and Amending Articles 6 and 10 of the Federal Law "On Personal Data"] [Electronic resource]: Federal Law, Apr. 24, 2020, No. 123-FZ // Konsul'tantPlyus. Rossiya / Consultant Plus Inc. – Moscow, 2020.*

14. *Averkin, A.N. II i kognitivnyye nauki [AI and Cognitive Sciences] [Electronic resource] / A.N. Averkin // Pyatyye Pospelovskiye chteniya "Iskusstvennyy intellekt segodnya. Problemy i perspektivy". – Mode of access: https://clck.ru/rcV7w. – Date of access: 22.06.2022.*

15. *Artificial Consciousness: What Is It and What Are the Issues? [Electronic resource] // Future of Work Hub. – Mode of access: https://clck.ru/rcUq6. – Date of access: 22.06.2022.*

16. *Filipova, I.A. Pravovoye regulirovaniye iskusstvennogo intellekta [Legal Regulation of Artificial Intelligence]: Study Guide / I.A. Filipova. – 2nd ed. – Nizhny Novgorod: Nizhegorodskiy gosudarstvennyy universitet imeni N.I. Lobachevskogo, 2022. – 275 p.*

17. *Circular of the State Council on Printing and Distributing the Outline of the Plan for the Construction of the Social Credit System (2014–2020) [Electronic resource] // The State Council. The People's Republic of China. – Mode of access: http://www.gov.cn/zhengce/content/2014-06/27/content_8913.htm. – Date of access: 22.06.2022.*

18. *Artificial Intelligence and Human Rights in Australia / B. Solomon [et al.] // Artificial Intelligence for Better or Worse. – Melbourne: Future Leaders, 2019. – P. 87–114.*

19. *Saudi Arabia Gives Citizenship to a Non-Muslim, English-Speaking Robot [Electronic resource] // Newsweek. – Mode of access: https://clck.ru/rcUWQ. – Date of access: 22.06.2022.*

20. *Saudi Arabia Bestows Citizenship on a Robot Named Sophia [Electronic resource] // TechCrunch. – Mode of access: https://clck.ru/rcUTL. – Date of access: 22.06.2022.*

21. *Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts [Electronic resource] // EUR-Lex. Access to the European Union Law. – Mode of access: https://clck.ru/rcWBe. – Date of access: 22.06.2022.*

22. *Mosechkin, I.N. Iskusstvennyy intellekt v ugolovnom prave: perspektivy sovershenstvovaniya okhrany i regulirovaniya [Artificial Intelligence in Criminal Law: Prospects for Improving the Protection and Regulation] / I.N. Mosechkin. – Kirov: Vyatskiy gosudarstvennyy universitet, 2020. – 111 p.*

23. *Koryachenkova, Yu.O. Iskusstvennyy intellekt: vyzovy dlya prava intellektual'noy sobstvennosti [Artificial Intelligence: Challenges for Intellectual Property Rights] / Yu.O. Koryachenkova // Mezhdunarodnyye otnosheniya: istoriya, teoriya, praktika: Materials of the XI Scientific and Practical Conference of Young Scientists of the International Relations Faculty of the Belarusian State University, Minsk, Feb. 4, 2021 / Belarusian State University; eds Ye.A. Dostanko [et al.]. – Minsk: BGU, 2021. – P. 132–137.*

24. *Sesitskiy, Ye.P. Problemy pravovoy okhrany rezul'tatov, sozdavayemykh sistemami iskusstvennogo intellekta [Problems of Legal Protection of Results Generated by Artificial Intelligence Systems]: Ph.D. Legal Sc. Diss.: 12.00.03 / Ye.P. Sesitskiy. – Moscow, 2018. – 218 p.*

**LEGAL ASPECTS OF THE USE OF ARTIFICIAL INTELLIGENCE
IN THE IMPLEMENTATION OF THE uSPACE GEOCOSMIC PROGRAM**
A. Unitsky, M. Gorbunov

291

25. *Yadrevskiy, O.O. Osnovnyye napravleniya sovershenst-vovaniya zakonodatel'stva ob avtorskom prave v sve-te razvitiya tsifrovykh tekhnologiy [The Main Directions of Improving Copyright Legislation in the Light of the Development of Digital Technologies] / O.O. Yadrevskiy // Zhurnal Belorusskogo gosudarstvennogo universiteta. Pravo. – 2021. – No. 3. – P. 23–31.*

26. *Draft Recommendation on the Ethics of Artificial Intelligence [Electronic resource] // UNESCO. – Mode of access: https://clck.ru/32k7cY. – Date of access: 22.06.2022.*

27. *Recommendation of the Council on Artificial Intelligence [Electronic resource] // OECD Legal Instruments. – Mode of access: https://clck.ru/rcUgf. – Date of access: 22.06.2022.*

28. *Kazakevich, A.P. Pravovyye aspekty mezhdunarodnogo sotrudnichestva v oblasti osvoyeniya kosmosa [Legal Aspects of International Cooperation in the Field of Space Exploration] / A.P. Kazakevich // Bezraketnaya industri-alizatsiya blizhnego kosmosa: problemy, idei, proyekty: Collection of Articles of the III International Scientific and Technical Conference, Maryina Gorka, Sep. 12, 2020 / Astroengineering Technologies LLC, Unitsky String Technologies Inc.; ed. A.E. Unitsky. – Minsk: StroyMediaProyekt, 2021. – P. 102–115.*

29. *Standards by ISO/IEC JTC 1/SC 42: Artificial Intelligence [Electronic resource] // ISO. – Mode of access: https://clck.ru/rcUdY. – Date of access: 22.06.2022.*

30. *Dorozhnaya karta razvitiya "skvoznoy" tsifrovoy tekhno-logii "Neyrotekhnologii i iskusstvennyy intellekt" [Roadmap for the Development of "End-to-End" Digital Technology "Neurotechnologies and Artificial Intelligence"] // Konsul'-tantPlyus. Rossiya / Consultant Plus Inc. – Moscow, 2022.*

292

Collection of Articles of the V International Scientific and Technical Conference
**"NON-ROCKET NEAR SPACE INDUSTRIALIZATION:
PROBLEMS, IDEAS, PROJECTS"**

LEGAL ASPECTS OF THE USE OF ARTIFICIAL INTELLIGENCE
IN THE IMPLEMENTATION OF THE uSPACE GEOCOSMIC PROGRAM
A. Unitsky, M. Gorbunov

293