Artificial Intelligence in Law Enforcement and Justice Bodies: Domestic and European Experience

Snieguolė Matulienė * [a], Viktor Shevchuk ** [a, b], Jurgita Baltrūnienė * [a]**

* Doctor of Law, Professor, Public Security Academy of Mykolas Romeris University, Vilnius, Lithuania, ORCID: https://orcid.org/0000-0001-5379-4412, e-mail: m.sniega@mruni.eu
** Doctor of Law, Professor, Yaroslav Mudryi National Law University, Kharkiv, Ukraine, ORCID: https://orcid.org/0000-0001-8058-3071, e-mail: Shevchuk_viktor@ukr.net
*** Public Security Academy of Mykolas Romeris University, Kaunas District Prosecutor's Office, Vilnius, Lithuania, ORCID: https://orcid.org/0000-0001-8323-0570, e-mail: baltruniene.jurgita@gmail.com

[a] Writing — original draft, Validation, methodology.
[b] Project Administration, Supervision.

DOI: 10.32353/khrife.4.2022.02 UDC 343.98
Submitted: 20.12.2022 / Reviewed: 20.12.2022 / Approved for Print: 21.12.2022 / Avialable online: 30.12.2022

OPEN ACCESS

The primary concerns of this research paper are to reveal current issues of the application of artificial intelligence technologies in law enforcement and justice bodies in the conditions of martial law and global threats; to identify the main trends, issues and forensic research prospects using artificial intelligence through the prism of European integration processes; to highlight gaps in the normative and legal regulation of the use of digital technologies; outline directions for its improvement. In order to reach objectives, general scientific and special methods (in particular, dialectical, analytical, induction and deduction, and others) were applied. The domestic and European experience in the application of artificial intelligence technologies in law enforcement and justice bodies was analyzed, and their promising directions were determined. We consider that legal regulation of the application of artificial intelligence in Ukraine should be carried out according to European standards, rules and recommendations in

This article is translation of the original Ukrainian content, which source is available at the link: *https://khrife-journal.org/index.php/journal* (translated by Tetiana Droshchenko). The author acknowledges translation as corresponding to the original.

© 2022 The Author(s). Published by National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute» & Yaroslav Mudryi National Law University.
This is an open access article distributed under Creative Commons Attribution License (CC_BY_4.0.0) allowing unlimited use, distribution and reproduction on any medium, subject to reference to the Author(s) and original sources.

accordance with the European integration course chosen by our state. Note that introduction of the artificial intelligence into legal proceedings should be based preliminary on the principles of the rule of law, observance of basic human rights, respect for honor and dignity, equality before the law and the court, proportionality, competition between the parties, transparency, impartiality and justice. Artificial intelligence is not capable of completely replacing judges, however, its implementation will contribute to the optimization of the work of the judge and court. It is substantiated that in today's military realities, the issue on increasing the effectiveness of the investigation of modern war crimes and cybercrimes with the help of digital technologies has become acute.

Keywords: *artificial intelligence; criminalistics; criminalistic knowledge; specific expertise; digital criminalistics; forensic examination; digital evidence; war crimes investigation; crime prevention; trends in the development of criminalistics.*

Research Problem Formulation

With the development of information technologies and active digitalization of society, the beginning of the 21st century often called the era of innovation, one of the most relevant and significant achievements of which was artificial intelligence. Nowadays, humanity use artificial intelligence technologies quite widely in various fields of both everyday life and professional activity (in particular, in jurisprudence) [1]. Digital Revolution as a factor of the dynamic development of society has contributed to the creation of a digital economy, the formation of the foundations of digital law, new configuration of social relations due to the Internet, social networks, and information and communication technologies. Modern digital technologies form a new way of production, create prerequisites for transition to a new formation, digitalization of social relations and the law itself, which regulates these relations [2].

Today, the artificial intelligence is not just a technological trend, a buzzword, or a temporary fad, it is the third computer era, based on innovation and advanced technologies. We are at the stage of fundamental changes unlike that experienced by the generation of the first industrial [3]. The formation of a new type of industrial production is taking place, which is based on *Big Data* and their analysis, full automation

1 Пилипчук В. Г., Баранов О. А., Гиляка О. С. Проблема правового регулювання у сфері штучного інтелекту в контексті розвитку законодавства Європейського Союзу. *Вісник Національної академії правових наук України*. 2022. Т. 29. № 2. С. 35—62. DOI: 10.37635/jnalsu.29(2).2022.35-62 (date accessed:17.10.2022).

2 Petryshyn O. V., Hyliaka O. S. Human rights in the digital age: Challenges, threats and prospects. *Journal of the National Academy of Legal Sciences of Ukraine*. 2021. Vol. 28. No. 1. Pp. 15—23. DOI: 10.37635/jnalsu.28(1).2021.15-23 (date accessed:17.10.2022).

3 Вебб Е. Велика дев'ятка. Як IT-гіганти та їхні розумні машини можуть змінити людство / пер. з англ. І. Возняка. Харків, 2020. С. 9.

of production, virtual and augmented reality technologies, etc.[4], that is a society of digital technologies is being formed. In this regard, S. Pichai, Head of *Google* remarked that the achievements in the field of artificial intelligence will do more for humanity that the discovery of fire or electricity [5].

Digital technologies in modern realities are an integral component integrated into all spheres of human activity. Digitalization is becoming by far the most significant factor in the economic growth of any state and a new, innovative way of the development of any society. Digitalization is the newest reality of advanced countries of European and the whole world, therefore also of Ukraine, which has chosen the European vector of development [6]. New digital reality presents legal practice and science with many fundamentally new tasks related to the development of effective tools and models of legal regulation of various spheres of social life (in particular, in the field of combating crime).

On the other hand, digital reality has caused the emergence of new forms of crime: cybercrime, information fraud, a significant number of cyberattack on enterprises and institutions, which requires counteraction by law enforcement agencies, study and research of this phenomenon. Digital information (as an integral attribute of modern crime and activities of criminal justice bodies) determines the prospects for the development of legal science, in particular criminology [7], which is at the forefront of the fight against crime in the realities of martial law, the digitalization of society and the active use of digital technologies in various spheres of human activity.

Artificial intelligence is a system that behaves intelligently, analyzing its environment and making fairly autonomous decisions to achieve a goal [8]. Artificial intelligence systems may be purely software-based and operate in a virtual world (e.g., voice synthesizers, video analysis software, search engines, speech and facial recognition systems) or may be integrated into hardware (e.g., robotics, unmanned vehicles means, drones or objects of the Internet of Things, IoT. Modern person uses artificial intelligence every day — for

4 Кривицький Ю. В. Штучний інтелект як інструмент правової реформи: потенціал, тенденції та перспективи. *Науковий вісник Національної академії внутрішніх справ*. 2021. № 2 (119). С. 90—101. DOI: 10.33270/01211192.90 (date accessed:17.10.2022).

5 Clifford C. Google CEO: A. I. is more important than fire or electricity / CNBC. Feb 1, 2018. URL: https://www.cnbc.com/2018/02/01/google-ceo-sundar-pichai-ai-is-more-important-than-fire-electricity.html (date accessed:17.10.2022).

6 Журавель В. А., Шепітько В. Ю. Розвиток криміналістики та судової експертизи в Україні: наближення до єдиного європейського простору / Правова наука України: сучасний стан, виклики та перспективи розвитку : монографія. Харків, 2021. С. 651—669 ; Шевчук В. М. Європейський вектор розвитку сучасної криміналістики. *Адаптація правової системи України до права Європейського Союзу: теоретичні та практичні аспекти* : мат-ли Всеукр. наук.-практ. конф. з наголи 20-ї річн. створ. Полтав. юрид. ін-ту НЮУ ім. Ярослава Мудрого (Полтава, 29.09.2022). Полтава, 2022. С. 320—323. URL: http://pli.nlu.edu.ua/wp-content/uploads/2022/12/Збірник-29.09.pdf (date accessed:17.10.2022).

7 Tymoshenko Y. P., Kozachenko O. I., Kyslenko D. P., Horodetska M. S., Chubata M. V., Barhan S. S. Latest technologies in criminal investigation (testing of foreign practices in Ukraine). *Amazonia Investiga*. 2022. Vol. 11. No. 51. Pp. 149—160. DOI: 10.34069/AI/2022.51.03.14 (date accessed:17.10.2022).

8 Baltrūnienė J. Dirbtinis intelektas ir duomenų apsauga kriminalistikos plėtros kontekste / Kriminalistikos teorijos plėtra ir teismo ekspertologijos ateitis: liber amicorum profesoriui Egidijui Vidmantui Kurapkai. Kolektyvinė monografija. Vilnius, 2022. P. 203.

example, to translate texts, create subtitles for videos or block e-mails (spam). Therefore, artificial intelligence as the latest scientific achievement needs new forensic ideas and methods related to its use in the fight against crime [9].

Under such circumstances, the main task of criminology is the development and application of innovative means, techniques and methods that make it possible to effectively collect, research, and use various evidentiary information [10] (in particular, digital) in the pre-trial investigation and during the trial. That is why, in the realities of wartime in Ukraine, the question of increasing the role of forensics and the use of artificial intelligence technologies in the activities of law and order bodies and justice in view of European experience and modern practice has become acute.

Analysis of Recent Researches and Publications

The scientific basis of the research was made up of the works devoted to the study and development of current problems of the use of digital technologies in the activities of law enforcement agencies and justice, such domestic and foreign forensic scientists as H. K. Avdieieva [11], R. Akerman [12], V. Bilous [13], O. Domashenko [14], O. Dumchykov [15],

9 Jackson C. Artificial Intelligence Changing the World of Forensics Science. EasyChair Preprint. 2021. No. 5815. 3 p. URL: https://easychair.org/publications/preprint/1Fmk (date accessed:17.10.2022).

10 Textbook of criminalistics. Vol. 1: General theory / Ed. by H. Malevski, V. Shepitko. Kharkiv, 2016. P. 89—93.

11 Авдєєва Г. К. Проблеми використання систем штучного інтелекту в роботі органів кримінальної юстиції. *Використання технологій штучного інтелекту у протидії злочинності* : мат-ли наук.-практ. онлайн-семінару (Харків, 05.11.2020). Харків, 2020. С. 6—10.

12 Ackermann V. R., Kurapka V. E., Malewski H., Shepitko V. Schaffung eines einheitlichen europaisehen Kriniinalistischen Raumes: Die Tatigkeit offentlicher Organisationen zur Starkung der internationalen Beziehungen. *Kriminalistik.* 2020. Is. 6. Pp. 355—363.

13 Білоус В. В. Роль засобів криміналістики у протидії кіберзлочинності. *Міжнародні стандарти з кібербезпеки та їх застосування в Україні* : мат-ли «кругл. столу» (Харків, 19.04.2016). Харків, 2016. С. 15—20. URL: http://dspace.nlu.edu.ua/handle/123456789/10885 (date accessed:17.10.2022).

14 Домашенко О. М. Проблемні питання використання цифрових доказів у криміналістиці. *Інноваційні методи та цифрові технології в криміналістиці, судовій експертизі та юридичній практиці* : мат-ли міжнар. «кругл. столу» (Харків, 12.12.2019). Харків, 2019. С. 52—55. URL: https://ivpz.kh.ua/wp-content/uploads/2020/01/%D0%97%D0%B1%D1%96%D1%80%D0%BD-%D0%9A%D1%80%D1%83%D0%B3%D0%BB%D0%B8%D0%B9-%D1%81%D1%82%D1%96%D0%BB_%D0%86%D0%BD%D0%BD%D0%BE%D0%B2-%D0%B0%D1%86%D1%96%D0%B9%D0%BD%D1%96-%D0%BC%D0%B5%D1%82%D0%BE%D0%B4%D0%B8_2019-%D0%97%D0%B1%D1%96%D1%80%D0%BD%D0%B8%D0%BA.pdf (date accessed:17.10.2022).

15 Думчиков М. О. Процеси діджиталізації і криміналістика: ретроспективний аналіз. *Криміналістика і судова експертиза*. 2020. Вип. 65. С. 100—108. DOI: 10.33994/kndise.2020.65.10 (date accessed:26.09.2022).

V. Zhuravl [16], I. Kohutycha [17], V. E. Kurapka and H. Malievski [18], V. Konovalova and V. Shevchuk [19], O. Musiienko [20], Yu. Chornous [21], V. Shepitko [22] etc.

At the same time, there are currently a number of debatable issues in the study of the mentioned issues, in particular regarding: determining the place of artificial intelligence in the activities of law enforcement and justice bodies, analyzing gaps in the regulatory and legal regulation of the use of digital technologies and the need for their improvement in the context of European integration processes, studying the prospects for the use of artificial intelligence in justice of Ukraine and the countries of the European Union and other important issues that require immediate resolution.

Under such conditions, the research of the theoretical and methodological principles of optimization of investigative and judicial activity through the use of artificial intelligence technologies for the effective solution of judicial tasks in martial law conditions and the further introduction of their main provisions and forensic recommendations into law enforcement practice are essential. Meanwhile, the analys of scientific publications on the mentioned issues shows that only separate works are devoted to the study of these issues (A. Idder and

16 Журавель В. А. Загальна теорія криміналістики: ґенеза та сучасний стан : монографія. Харків, 2021. С. 6—7.

17 Когутич І. І. Про окремі виклики криміналістиці та шляхи її усталення. *Криміналістика і судова експертиза*. 2020. Вип. 65. С. 5—19. DOI: 10.33994/kndise.2020.65.01 (date accessed:26.09.2022).

18 Курапка В. Э., Малевски Г. Научная концепция криминалистической политики в стратегиях органов правопорядка как инновационный прорыв в обеспечении создания общего европейского криминалистического пространства. *Інноваційні методи та цифрові технології в криміналістиці* … . С. 85. URL: https://ivpz.kh.ua/wp-content/uploads/2020/01/%D0%97%D0%B1%D1%96%D1%80%D0%BD-%D0%9A%D1%80%D1%83%D0%B3%D0%BB%D0%B8%D0%B9-%D1%81%D1%82%D1%96%D0%BB_%D0%86%D0%BD%D0%BD%D0%BE%D0%B2-%D0%B0%D1%86%D1%96%D0%B9%D0%BD%D1%96-%D0%BC%D0%B5%D1%82%D0%BE%D0%B4%D0%B8_2019-%D0%97%D0%B1%D1%96%D1%80%D0%BD%D0%B8%D0%BA.pdf (date accessed:17.10.2022).

19 Konovalova V. O., Shevchuk V. M. Modern criminalistics in the conditions of war: problems of adaptation and reload. *Modern research in world science* : Proceedings of the 5th International scientific and practical conference (August 7—9, 2022). Lviv, 2022. Pp. 896—903. URL: https://sci-conf.com.ua/wp-content/uploads/2022/08/MODERN-RESEARCH-IN-WORLD-SCIENCE-7-9.08.2022.pdf (date accessed:26.09.2022).

20 Мусієнко О. Л. Використання цифрових технологій при розслідуванні злочинів. *Інноваційні методи та цифрові технології в криміналістиці* … . С. 99—102. URL: https://ivpz.kh.ua/wp-content/uploads/2020/01/%D0%97%D0%B1%D1%96%D1%80%D0%BD-%D0%9A%D1%80%D1%83%D0%B3%D0%BB%D0%B8%D0%B9-%D1%81%D1%82%D1%96%D0%BB_%D0%86%D0%BD%D0%BD%D0%BE%D0%B2%D0%B0%D1%86%D1%96%D0%B9%D0%BD%D1%96-%D0%BC%D0%B5%D1%82%D0%BE%D0%B4%D0%B8_2019-%D0%97%D0%B1%D1%96%D1%80%D0%BD%D0%B8%D0%BA.pdf (date accessed:17.10.2022).

21 Чорноус Ю. М. Криміналістичне забезпечення розслідування злочинів : монографія. Вінниця, 2017. 492 с. URL: http://elar.naiau.kiev.ua/handle/123456789/16029 (date accessed:17.10.2022).

22 Шепітько В. Теоретико-методологічна модель криміналістики та її нові напрями. *Теорія та практика судової експертизи і криміналістики.* 2021. Вип. 3 (25). С. 9—20. DOI: 10.32353/khrife.3.2021.02 (date accessed:26.09.2022).

S. Kulo [23], Yu. Baltrunene [24], O. Dufeniuk [25], K. Dzhekson [26], A. Kolodina and T. Fedorova [27], I. Kohutych [28], L. Frimen [29], R. Stepaniuk and S. Perlin [30], V. Shepitko and M. Shepitko[31] etc.). Therefore, the issues of applying artificial intelligence technologies in the activities of law and order bodies and justice in modern conditions of global threats are very relevant and require thorough scientific research.

Research Purpose

To study the possibilities of applying artificial intelligence technologies in law enforcement and justice bodies in modern conditions of martial law and global threats, as well as to determine the main trends, issues and forensic research prospects using artificial intelligence through the prism of European integration processes.

Research Methods

To carry out the research, a system of scientific methods of scientific knowledge was applied, in particular general philosophical, general scientific (dialectical, analysis, synthesis, abstraction, analogy), private methods of scientific knowledge which are used in many branches of science (comparative, quantitative and qualitative analysis), as well as special legal ones (formal-legal, comparative-legal, systemic-structural). The methodological basis of the study is the dialectical method of scientific knowledge, which reflects the relationship between theory and practice, as well as the conceptual positions of forensics as a science.

23 Idder A., Coulaux S. Artificial intelligence in criminal justice: invasion or revolution? / International Bar Association. 13.12.2021. URL: https://www.ibanet.org/dec-21-ai-criminal-justice (date accessed:12.10.2022).

24 Baltrūnienė J. Op. cit. Pp. 201—220.

25 Дуфенюк О. Розслідування воєнних злочинів в Україні: виклики, стандарти, інновації. *Baltic Journal of Legal and Social Sciences.* 2022. № 1. С. 46—56. DOI: 10.30525/2592-8813-2022-1-6 (date accessed:12.10.2022).

26 Jackson C. Op. cit. URL: https://easychair.org/publications/preprint/1Fmk (date accessed:17.10.2022).

27 Колодіна А. С., Федорова Т. С. Цифрова криміналістика: проблеми теорії і практики. *Київський часопис права.* 2022. № 1. Pp. 176—180. DOI: 10.32782/klj/2022.1.27 (date accessed:12.10.2022).

28 Когутич І. І. Застосування цифрових технологій — новий напрям криміналістики. *Наукові читання пам'яті Ганса Гросса* : зб. тез міжнар. наук.-практ. конф. (Чернівці, 09.12.2021). Чернівці, 2021. С. 79—84.

29 Freeman L. Digital Evidence and War Crimes Prosecutions: The Impact of Digital Technologies on International Criminal Investigations and Trials. *Fordham International Law Journal.* 2018. No. 41. Is. 2. Pp. 284—336. URL: https://ir.lawnet.fordham.edu/ilj/vol41/iss2/1 (date accessed:12.10.2022).

30 Степанюк Р. Л., Перлін С. І. Цифрова криміналістика й удосконалення системи криміналістичної техніки в Україні. *Вісник Луганського державного університету внутрішніх справ ім. Е. О. Дідоренка.* 2022. № 3 (99). DOI: 10.33766/2524-0323.99.283-284 (date accessed:17.10.2022).

31 Шепітько В., Шепітько М. Формування цифрової криміналістики як стратегічний напрямок розвитку науки. *Kriminalistika a Forenzne Vedy: Veda, Vzdelavanie, Prax* : 17 Medzinarodny Kongres Zbornik Prispevkov (16—17 sept 2021, Bratislava, Slovenská republika). Bratislava, 2021. Pp. 187—198. URL: https://www.akademiapz.sk/sites/default/files/KKFV/2020/CrimCongres2021 zborník draft digit v6 202107.pdf (date accessed:26.09.2022).

The formal-logical method was applied during the analysis of the content of current European and domestic legislation regarding the use of artificial intelligence technologies in law enforcement and justice bodies in view of European experience and modern practice. Thanks to the comparative legal method, an analysis was carried out and the peculiarities of the legislative regulation of the use of artificial intelligence were studied in order to identify the most advanced legal means and mechanisms that can be implemented into the legislation of Ukraine in the relevant field of application of artificial intelligence technologies.

The theoretical basis of the research is mainly scientific works and conclusions of leading foreign experts, dedicated to the study of issues of the artificial intelligence functioning in law enforcement and justice bodies regarding the protection of human rights in the conditions of mass digitization of social relations. The normative base of this research includes acts of the European Parliament, recommendations of the European Commission, normative legal acts of European countries, international organizations, current laws and other normative legal acts of Ukraine, which regulate social and legal relations that arise in connection with the use of artificial intelligence. The analysis of the legal framework shows the presence in EU legislation of the necessary legal foundations and effective mechanisms for regulating social relations in the field of digital transformation and the development of information technologies in various spheres (in particular, in law enforcement and justice bodies), which Ukraine successfully applied in this field of knowledge.

Main Content Presentation

The modern stage of development of social relations is characterized by rapid activation and application of digital (information) technologies in all spheres of human life. Today, autopilots drive cars, smartphones distinguish their owners from outsiders, virtual assistants answer any question, street cameras recognize criminals, "cyber judges" make court decisions, robots perform surgical operations, high-precision military weapons and drones hit targets — and this is far from an exhaustive list of cases when modern artificial intelligence technologies help humans perform various complex tasks [32]. Under the influence of the achievements of scientific and technical progress and further digitization of society, people are moving step by step from the usual, material world to the digital space.

Under such conditions, our society is actively moving towards digital superintelligence, which is significantly superior to human intelligence. We see that artificial intelligence is capable not only of self-improvement: it knows the principles and mechanisms of its own functioning, the solution of complex intellectual tasks, which enables it to surpass human intelligence in some situations. The advantages of its use include, in particular: accuracy and speed of data processing; analysis of a significant amount of information in a short period of time; reducing errors and increasing the chances of achieving results of higher accuracy; cost reduction and labor productivity improvement; no need for sleep or a lunch break; fatigue; the ability to work in a potentially dangerous environment for humans [33].

32 Kosilova O. I., Rozghon O. V., Solodovnikova C. K., Stolbovyi V. M., Barabash O. O. Observance of Human Rights in the Use of AI as Technology. *Law, State and Telecommunications Review.* 2022. Vol. 14. No. 2. Pp. 38—67. DOI: 10.26512/lstr.v14i2.41558 (date accessed:17.10.2022).

33 Як діє штучний інтелект і перспективи його використання / AI Conference. Kyiv. 2020. URL: https://aiconference.com.ua/uk/news/printsipi-raboti-iskusstvennogo-intellekta-i-perspektiva-ego-ispolzovaniya-92238 (date accessed:17.10.2022).

Despite all the positive possibilities and potential, recently, artificial intelligence technologies are increasingly used by criminals inventing new ways of criminal activity using digital technologies and thus producing an increase in the level of crime. In addition, criminogenic factors of artificial intelligence cause new threats and new challenges to the legally protected interests of both individual citizens and the state and society in general, requiring adequate means of countering such criminal law [34] and forensic means [35].

Therefore, we also must admit the number of issues provoked by the use of artificial intelligence, the solution of which should become the primary task of the scientific community and the state. Thus, security, reliability, transparency, fairness, ethics and equality (impartiality), prevention of violations of basic human rights, especially when it is impossible to predict the consequences of the use of new technologies, require close attention in the development and introduction of artificial intelligence. As artificial intelligence spreads into the daily life of humanity, the problem of non-compliance and violation of basic human and citizen rights becomes more and more serious [36].

Among the current issues are the problems of determining the place of artificial intelligence in the activities of law enforcement and justice bodies, analyzing and defining the concept of artificial intelligence and the need for its improvement in the context of European integration processes, researching the legal prerequisites for the use of artificial intelligence in law enforcement activities and justice in view of European integration, analysis of gaps in the regulatory and legal regulation of the use of digital technologies, problems and prospects of the use of artificial intelligence in the justice system of Ukraine and the countries of the European Union, ensuring the protection of the rights and legitimate interests of individuals and legal entities from violations with the use of digital technologies, prosecution for damage caused by the use digital technologies, etc. Let's analyze the named problems and outline directions for their solution.

Legal prerequisites for the use of artificial intelligence in law enforcement and justice in the light of European integration.

It should be noted that the formation of the legislative framework in Ukraine on these issues is based on international standards and moves in the direction of the European strategy for the development of artificial intelligence [37]. Developing a legal framework based on human rights and fundamental values (as declared in this document), Ukraine, becoming a candidate for the EU, is obliged to form and implement

34 Radutniy O. E. Novel Criminal Delicts Related to Digital Human Being. *Вісник Асоціації кримінального права України.* 2020. Т. 1. № 13. С. 16—28. URL: http://vakp.nlu.edu.ua/issue/view/12594 (date accessed:17.10.2022).

35 Konovalova V. O., Shevchuk V. M. Op. cit. URL: https://sci-conf.com.ua/wp-content/uploads/2022/08/MODERN-RESEARCH-IN-WORLD-SCIENCE-7-9.08.2022.pdf (date accessed:26.09.2022).

36 Турута О. В., Турута О. П. Штучний інтелект крізь призму фундаментальних прав людини. *Науковий вісник Ужгородського національного університету. Серія Право.* 2022. Вип. 71. С. 50. DOI: 10.24144/2307-3322.2022.71.7 (date accessed:26.09.2022).

37 Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions — Coordinated Plan on Artificial Intelligence (COM(2018) 795 final) / European Commission. URL: https://digital-strategy.ec.europa.eu/en/library/coordinated-plan-artificial-intelligence (date accessed:19.10.2022).

an artificial intelligence system that will be useful to citizens, businesses and the national government. EU members, Ukraine and the European Commission should work together in this direction, ensuring advanced positions of artificial intelligence technologies and prospects for their implementation [38].

In view of the European integration course chosen by Ukraine, the formation and further improvement of domestic legislation regarding the legal regulation of the use of artificial intelligence should be based on already formed European standards, rules and recommendations [39]. Simultaneously, the European Commission defines as one of the three main goals of coordination in the field of artificial intelligence the mandatory consideration of all social values and fundamental rights of the EU in the use of new technologies of artificial intelligence, in particular, ethical and legal issues [40]. The development and formation of national legislation must necessarily be based on the advanced European experience of legal regulation of this field of activity, analyzing both positive and negative consequences, as well as the procedure for determining responsibility for mistakes that caused negative consequences [41].

A decisive step in choosing the direction of the European strategy regarding artificial intelligence in domestic politics was the Concept of the Development of Artificial Intelligence in Ukraine (hereinafter referred to as the Concept), the purpose of which is *"to determine the priority areas and main tasks of the development of artificial intelligence technologies to satisfy the rights and legitimate interests of individuals and legal entities, building a competitive national economy, improving the public administration system"* [42]. One of the tasks envisaged by this Concept for justice is to ensure *"judgment in cases of minor complexity (by mutual consent of the parties) based on the results of the analysis carried out using artificial intelligence technologies, the state of compliance with legislation and judicial practice"* [43].

An essential step for Ukraine was also the adoption of the European Ethical Charter on the use of Artificial Intelligence in judicial systems and their environment (hereinafter referred to as the Ethical Charter), which is considered a system of uniform principles and rules for the use of artificial intelligence in the judicial system and which specifies the main categories of the involvement of artificial intelligence, namely: advanced search systems of court practice; online dispute resolution; assistance in drafting claims; predictive analysis; categorization of the provisions of the law according to various criteria and

38 Пістракевич О. В. Стратегії розвитку штучного інтелекту в Європейському Союзі (на прикладі країн Вишеградської групи. *Міжнародні відносини, суспільні комунікації та регіональні студії.* 2021. № 1 (9). С. 162. URL: https://elibrary.kubg.edu.ua/id/eprint/39141/1/O_Pistrakevych_IRPCRS_1%289%29_2021.pdf (date accessed:17.10.2022).

39 Velykanova M. M. Artificial intelligence: legal problems and risks. *Journal of the National Academy of Legal Sciences of Ukraine.* 2020. Vol. 27. No. 4. Pp. 185—198. DOI: 10.37635/jnalsu.27(4).2020.185-198 (date accessed:17.10.2022).

40 Баранов О. А. Правові аспекти національних стратегій розвитку штучного інтелекту. *Юридична Україна*. 2019. № 7. С. 25—29.

41 Федоренко О. А., Стрільців О. М., Тарасенко О. С. Використання технологій штучного інтелекту у правоохоронній діяльності. Аналітичний огляд. Київ, 2022. С. 18—19.

42 Концепція розвитку штучного інтелекту в Україні : схвал. розпорядж. КМУ від 02.12.2020 р. № 1556-р (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/1556-2020-%D1%80#Text (date accessed:19.10.2022).

43 Ibidem.

identification of discrepant or incompatible provisions; chatbots to inform parties or support them in court proceedings [44]. The adoption of the Ethical Charter settled the issues of the implementation of artificial intelligence to the transformation of information technologies in the justice system of Ukraine.

Ukrainian experts also consider the *"White Paper on Artificial Intelligence — European Approach to Excellence and Trust"* (2020) relevant, which states that artificial intelligence should work for the benefit of people and society. The purpose of this document is to outline possible changes that will contribute to the reliable and safe development of artificial intelligence in Europe, respecting the values and rights of EU citizens [45].

Another significant achievement in determining the direction of the European strategy regarding artificial intelligence was that Ukraine (as a member of the Special Committee on Artificial Intelligence at the Council of Europe) joined the Organization for Economic Cooperation and Development, Recommendation of the Council on Artificial Intelligence, OECD/LEGAL/0449 in October 2019 [46]. The recommendations include suggestions for national policymakers for international cooperation in the development and safe use of artificial intelligence, namely: investment in research and development of artificial intelligence; promoting the development of a digital ecosystem for artificial intelligence; formation of a favorable political environment for artificial intelligence; building human potential and preparing for the transformation of the labor market.

In addition, Ukraine joined the *"Digital Europe"* Program (2021—2027) [47], aimed at the development of leading digital skills, introduction of digital technologies at enterprises, development of digital infrastructure, as well as the even greater availability of digital services for citizens and state institutions EU countries and associated countries. The *"Digital Europe"* Program provides funding for the digitalization of European countries in various directions, its goal is to accelerate economic recovery and digital transformation. Participation in the Program will bring Ukraine closer to the EU's Single Digital Market provides funding for the digitalization of European countries in various directions, its goal is to accelerate economic recovery and digital transformation. Participation in the Program will bring Ukraine closer to the EU's Single Digital Market [48].

Simultaneously, the lack of an appropriate legal framework for the use of artificial intelligence requires finding ways to overcome risks and threats to human rights, restore violated rights, and minimize

44 European ethical Charter on the use of Artificial Intelligence in judicial systems and their environment. Adopted at the 31st plenary meeting of the CEPEJ (Strasbourg, 3—4 December 2018) / Council of Europe. URL: https://rm.coe.int/ethical-charter-en-for-publication-4-december-2018/16808f699c (date accessed:16.10.2022).

45 White Paper on Artificial Intelligence: a European approach to excellence and trust / European Commission. URL: https://commission.europa.eu/publications/white-paper-artificial-intelligence-european-approach-excellence-and-trust_en (date accessed:17.10.2022).

46 Recommendation of the Council on Artificial Intelligence / OECD Legal Instruments. URL: https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449 (date accessed:19.10.2022).

47 Програма ЄС «Цифрова Європа» (2021—2027) / Дія.Бізнес. URL: https://business.diia.gov.ua/digital-europe-programme (date accessed:17.10.2022).

48 Україна долучилася до Програми «Цифрова Європа»: що це означає / Урядовий портал. 05.09.2022. URL: https://www.kmu.gov.ua/news/ukraina-doluchylasia-do-prohramy-tsyfrova-ievropa-shcho-tse-oznachaie (date accessed:19.10.2022).

threats to the use of artificial intelligence technologies in various spheres of life (in particular, legal). Since digital technologies (as a kind of innovation) affect various spheres of human life, the states embody the understanding of the importance of their intensive implementation in the relevant development strategies aimed at sustainable economic growth and strengthening the competitive position of each country in the global economic environment. A significant role in innovation is played by digital technologies that use electronic equipment and make it possible to speed up and facilitate various processes [49]. This fully applies to the legal principles of the use of artificial intelligence in law enforcement and justice.

The European Union, trying to transform the policy of digital plans into concrete goals and ensure their implementation by 2030, proposes to establish a digital policy index. The basis of the indicator will be an improved surveillance system in EU, which will monitor the speed of digital transformation, the shortcomings of the digital strategy in Europe and the implementation of digital principles. The document will indicate the means of applying the vision and define the main orientations in four directions. The first two areas are digital capabilities, education and skills development, the rest are digital transformation of business and public services [50].

In view of this, it is worth noting that artificial intelligence, like any other emerging transformative technology, may raise new ethical and legal issues — for example, those related to liability or potentially biased decision-making [51]. Therefore, the EU must ensure the development and deployment of artificial intelligence within the framework of an appropriate legal framework that promotes innovation in accordance with the values and fundamental rights of citizens, as well as ethical principles such as accountability and transparency. The EU has every opportunity to manage such processes at the global level [52]. Therefore, the issues of further developments in the field of artificial intelligence, as well as the regulation of activities in this area, are relevant for modern European and domestic politics.

The controversial definition of the concept of artificial intelligence and the need for its improvement in the context of European integration processes

Analyzing legal prerequisites for the use of artificial intelligence in law enforcement and justice in the EU countries and Ukraine, it is necessary to pay attention to a certain debatability of the concept of *"artificial intelligence"*: it is the Concept of the Development of Artificial Intelligence in Ukraine as an organized *"a set of information technologies, with the use of which*

49 Kosilova O. I.; Rozghon O. V., Solodovnikova C. K., Stolbovyi V. M., Barabash O. O. Op. cit. C. 39. DOI: 10.26512/lstr.v14i2.41558 (date accessed:17.10.2022).

50 Komisijos Komunikatas Europos Parlamentui, Tarybai, Europos Ekonomikos ir Socialinių Reikalų Komitetui ir Regionų Komitetui 2030 m. skaitmeninės politikos kelrodis : Europos skaitmeninio dešimtmečio kelias (COM(2021) 118 final). Briuselis, 2021.03.09 / Infolex. URL: https://www.infolex.lt/teise/default.aspx?id=1929&crd=1243617&qi=7005421 (date accessed:19.10.2022).

51 Von der Leyen U. A Union that strives for more. My agenda for Europe / European Commission. URL: https://www.europarl.europa.eu/resources/library/media/20190716RES57231/20190716RES57231.pdf (date accessed:19.10.2022).

52 Baltrūnienė J. Op. cit. P. 204.

it is possible to perform complex tasks by using a system of scientific methods of research and algorithms for processing information obtained or independently created during work, as well as to create and use one's own knowledge bases, decision-making models, algorithms for working with information and to determine the ways of achieving the set tasks" [53]. At the same time, the field of artificial intelligence is defined as *"an area of activity in the field of information technologies that ensure the creation, implementation and use of artificial intelligence technologies"* [54].

We consider that he disclosure of the concept of "artificial intelligence" only at the level of a domestic by-law is to some extent debatable from the point of view of its practical application. Therefore, the absence of a normative legal act in the form of a law, which would regulate the use of artificial intelligence in the judiciary of Ukraine, is one of the gaps in our legislation [55]. As for today in Ukraine, unfortunately, the concepts, types (forms) of artificial intelligence, principles, limits, conditions and order of its application, etc., have not been defined at the legislative level: these and other problems are currently considered only on a theoretical level. On the other hand, international legislation and foreign doctrines also do not provide a clear answer to certain questions in the field of the application of artificial intelligence [56]. Therefore, in today's realities, it is important to prepare and adopt a regulatory act in the form of a law that would regulate the use of artificial intelligence in the judiciary of Ukraine.

In our opinion, when forming the definition of the concept of *"artificial intelligence"*, it is necessary to take into account the work of foreign scientists [57], the positive experience of the EU countries, the USA, Japan, China and Ukraine [58]. For instance, the experience of EU countries shows the importance of two components — digital competence and awareness of the population and high-quality Internet coverage. In addition, we see securing cyberspace as a priority in order to motivate consumers of the digital market. At the same time, it is important to support the development of information and communication provision of state platforms and stationary centers for receiving administrative services on the spot with the help of the Internet and information and communication-savvy civil servants [59].

Therefore, it is necessary to specify the definitions of artificial intelligence proposed in international documents.

53 Концепція розвитку штучного інтелекту ... . URL: https://zakon.rada.gov.ua/laws/show/1556-2020-%D1%80#Text (date accessed:19.10.2022).

54 Ibidem.

55 Karmaza O., Koucherets D. Artificial intelligence in the civil process: prospects for use. The latest development of the modern legal sciences and education in Ukraine and EU countries: an experience, challenges, expectations : collective monograph. Riga, 2021. Pp. 233—262. DOI: 10.30525/978-9934-26-033-9-14 (date accessed:17.10.2022).

56 Кармаза О. О., Федоренко Т. В. Принципи штучного інтелекту в правосудді України. *Право і суспільство.* 2021. № 2. С. 20. DOI: 10.32842/2078-3736/2021.2.3 (date accessed:17.10.2022).

57 Freeman L. Op. cit. URL: https://ir.lawnet.fordham.edu/ilj/vol41/iss2/1 (date accessed:12.10.2022).

58 Федоренко О. А., Стрільців О. М., Тарасенко О. С. Op. cit. С. 8—26.

59 Чалабієва М. Р. Позитивний досвід цифровізації країн Європейського Союзу. *Україна і Європейський Союз: шлях до сталого розвитку* : зб. наук. ст. за мат-лами V Всеукр. наук.-практ. конф. з європ. права (Харків, 12.11.2021). Харків, 2021. С. 30. URL: https://ndipzir.org.ua/wp-content/uploads/2021/11/Conf_12.11.21.pdf (date accessed:19.10.2022).

Thus, according to the resolution of the European Parliament, artificial intelligence is a smart robot that has the following features: acquires autonomy with the help of sensors and/or data exchange; independently studies the experience or interaction; has weak physical support; adapts the behavior model to the environment; is inanimate in the biological sense [60]. In the message of the European Commission, artificial intelligence is interpreted as systems that demonstrate mental activity in the form of analyzing the environment and taking measures (with a certain degree of autonomy) to achieve a specific goal. AI-based systems are software used in the virtual world to analyze images; speech and face recognition systems; search engines, etc.; also, artificial intelligence can be embedded in hardware devices (for example, autonomous machines, drones or objects of the *"Internet of Things"* network) [61].

Analysis of modern concepts of artificial intelligence shows that artificial intelligence and human intelligence are interconnected phenomena, since the functioning of artificial intelligence (the main characteristics of which are the ability to think, perceive, solve problems, learn, etc.) is based on the principles of human functioning, the only difference is in their nature — artificial intelligence is created by people [62].

When formulating the definition of artificial intelligence, researchers rely on the *concept of rationality*, because in order to choose the most optimal actions necessary to achieve a certain goal, certain criteria should be optimized, and for this you need to have available resources [63]. The North Atlantic Treaty Organization (NATO) pays considerable attention to the technologies of artificial intelligence and the practical aspects of their application and use from the point of view of compliance with national priorities, and also fully takes into account the possible problems associated with the spread of relevant technologies in the world. The fundamental technologies of artificial intelligence are designed to contribute to the transformation of the economy, the labor market, state institutions and, as a result, society in general. The use of such technologies opens up immeasurable opportunities in various spheres of socio-economic life (increasing production efficiency, reducing costs, improving the quality of goods and services, etc.) [64].

Therefore, in any new legal document, the definition of artificial intelligence should be formulated flexibly, taking into account modern achievements and

60 European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)). *Official Journal of the European Union*. 18.7.2018. Pp. 239—257. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017IP0051&rid=9 (date accessed:19.10.2022).

61 Communication from the commission to the European Parliament, the European council, the council, the European economic and social committee and the committee of the regions. Artificial Intelligence for Europe. (COM/2018/237 final). Brussels, 25.4.2018 / EUR-Lex. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2018:237:FIN (date accessed:19.10.2022).

62 Baltrūnienė J. Op. cit. Pp. 211.

63 A definition of Artificial Intelligence: main capabilities and scientific disciplines / European Commission. 08 April 2019. URL: https://digital-strategy.ec.europa.eu/en/library/definition-artificial-intelligence-main-capabilities-and-scientific-disciplines (date accessed:17.10.2022).

64 Kosilova O. I.; Rozghon O. V., Solodovnikova C. K., Stolbovyi V. M., Barabash O. O. Op. cit. C. 43. DOI: 10.26512/lstr.v14i2.41558 (date accessed:17.10.2022).

prospects of scientific and technological progress and digital technologies, and at the same time sufficiently precisely to ensure the necessary legal certainty. Certainly, there will also be risky cases of using artificial intelligence (due to the danger it creates or the purpose of such use), that is, regardless of the specific conditions, it should be subject to requirements, which we will consider further. As a strategic tool, artificial intelligence is able to predict future risks (in particular, hybrid ones) and overcome real threats, thus increasing the security of the EU [65]. It can also contribute to the fight against crime and terrorism by helping law enforcement agencies track the technologies used by criminals and cross-border criminal activity.

At the same time, despite the perception of artificial intelligence as a successful and popular digital technology, its application in various spheres of social life must comply with basic human rights in international documents. This is due to the presence of a certain conflict between the interests of subjects (those seeking economic growth, automation and personnel changes) and the observance of human rights, freedoms and interests in the case of the use of artificial intelligence technologies (in particular, with regard to the distribution of personal data, interference with the right to inviolability of private life, violation of freedom of expression, which is stipulated by the Convention on the Protection of Human Rights and Fundamental Freedoms [66], hereinafter referred to as *Convention on Human Rights*).

Since Ukraine is aimed at European integration, its information policy (in particular, the development of digital technologies and the use of artificial intelligence technologies) must necessarily become part of this process. It is necessary to develop artificial intelligence as one of the priority areas of scientific and technological research in the context of the processes taking place in this area in the EU countries, providing an appropriate domestic legislative framework and developing strategies taking into account the experience of both individual countries and European trends in general [67].

Also noteworthy is the approach of the Ukrainian scientific school to the definition of artificial intelligence [68], which is based on the application of on principles and mechanisms of the human

65 Komisijos Komunikatas Europos Parlamentui, Tarybai, Europos Ekonomikos ir Socialinių reikalų Komitetui ir Regionų Komitetui. Europos požiūrio į dirbtinį intelektą formavimas (COM(2021) 205 final). Briuselis, 2021.04.21 / Infolex. URL: https://www.infolex.lt/teise/default.aspx?id=1929&crd=1245300 (date accessed:19.10.2022).

66 Конвенція про захист прав людини і основоположних свобод (Європейська конвенція з прав людини) : від 04.11.1950 р.; ратифік. Законом України від 17.07.1997 р. № 475/97-ВР; чинна для України з 11.09.1997 р. (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/995_004#Text (date accessed:21.10.2022).

67 Пістракевич О. В. Op. cit. URL: https://elibrary.kubg.edu.ua/id/eprint/39141/1/O_Pistrakevych_IRPCRS_1%289%29_2021.pdf (date accessed:17.10.2022).

68 Баранов О. А. Інтернет речей: теоретико-методологічні основи правового регулювання. Т. 1: Сфери застосування, ризики і бар'єри, проблеми правового регулювання : монографія. Харків, 2018. 344 с. ; Karmaza O., Koucherets D. Op. cit. DOI: 10.30525/978-9934-26-033-9-14 (date accessed:17.10.2022) ; Radutniy O. E. Op. cit. URL: http://vakp.nlu.edu.ua/issue/view/12594 (date accessed:17.10.2022) ; Striltsiv O. M., Fedorenko O. A. Problems of legal regulation of the use of artificial intelligence technologies by the National Police of Ukraine. *Scientific Journal of the National Academy of Internal Affairs*. 2022. Vol. 27. No. 1. Pp. 30—39. DOI: 10.33270/0122271.30 (date accessed:17.10.2022).

brain's functioning (in particular, its consciousness). Experts consider the development of artificial consciousness as a global self-organized information product of the computer system that evaluates and controls the key processes that take place in it, distributes information between different parts of the system to coordinate their work and provides social and personal perception of reality. Based on the draft National Strategy for the Development of Artificial Intelligence in Ukraine [69] and preliminary analysis, artificial intelligence should be considered as an algorithm for solving creative problems, created and controlled by artificial consciousness of an artificial personality (machine).

The purpose of creating artificial intelligence is called copying (modeling) the work of the human brain, intelligence, mental activity, reproduction of cognitive function equivalent or identical in criteria, characteristics and indicators to human cognitive functions. Artificial intelligence is a set of methods, techniques, technologies and tools (in particular, hardware), computer programs that implement one, several or all cognitive functions equivalent to human cognitive functions [70]; it is a human-designed device or computer program for obtaining, processing and applying information and forming skills similar to actions consciously performed by a person [71].

Despite the discussions and certain doubts regarding the provision of a legal basis for artificial intelligence, on the way to European integration, Ukraine will not give up the achievements of scientific and technological progress. Therefore, legal regulation in the field of development and use of artificial intelligence remains relevant for the domestic legislator. European standards and recommendations for the protection of the rights and freedoms of developers of artificial intelligence and users of its achievements, contractual obligations and legal liability in this field should be the basis for the regulation of the latest technologies. Legislation reform in accordance with the requirements of the digital age must be comprehensive. There is an urgent need to unify the terminology, in particular, the legislative definition of the term *"artificial intelligence"* [72]. Therefore, the adoption of the law on the use of artificial intelligence in the activities of law enforcement agencies and the judiciary of Ukraine is very relevant today (taking into account the European experience).

69 Проєкт Національної стратегії розвитку штучного інтелекту в Україні (2021—2030) / МОН України, НАН України, Інститут проблем штучного інтелекту. Київ, 2021. С. 10—11. URL: https://www.naiau.kiev.ua/images/news/img/2021/06/strategiya-110621.pdf (date accessed:19.10.2022).

70 Баранов О. Ідентифікація робота зі штучним інтелектом як суб'єкта права. *Інтернет речей: проблеми правового регулювання та впровадження* : мат-ли друг. наук.-практ. конф. (Київ, 29.11.2018). Київ, 2018. С. 9. URL: http://ippi.org.ua/sites/default/files/zbirnik_tez_19.12.2018-maket_3-converted.pdf (date accessed:19.10.2022).

71 Мічурін Є. О. Правова природа штучного інтелекту. *Форум Права.* 2020. № 64 (5). С. 67—75. DOI: 10.5281/zenodo.4300624 (date accessed:19.10.2022).

72 Токарєва К. С., Савліва Н. О. Особливості правового регулювання штучного інтелекту в Україні. *Юридичний вісник.* 2021. Вип. 3 (60). С. 151. DOI: 10.18372/2307-9061.60.15967 (date accessed:19.10.2022).

Issues and prospects of using artificial intelligence in the justice system of Ukraine and EU countries

To consolidate the efforts of the state, scientists, educators, business, public and expert communities in the field of artificial intelligence, the Ministry of Digital Transformation of Ukraine created the Expert Committee on the Development of the Field of Artificial Intelligence [73], which proposed eight key areas of state policy in this area:

1) education and human capital;
2) science and innovations;
3) economics and business;
4) cyber security;
5) defense and security;
6) public administration;
7) legal regulation and ethics;
8) justice.

In the context of our research, from a scientific and practical point of view, the issue of the application of artificial intelligence, first of all, in justice, activities of law enforcement agencies, and the improvement of legal support for these types of activities are interesting.

The analysis of the sociological research conducted in Ukraine confirms the positive attitude of the majority of respondents to the active development of artificial intelligence. They see such positive moments primarily in: 1) freeing people from difficult, dangerous and unskilled jobs (69,5 %); 2) increase in productivity in all branches of industry (50,4 %); 3) prevention of diseases, prolongation of human life (19,9 %); 4) securing humanity from natural disasters and catastrophes (18,1 %); 5) prevention of crime and war (14,1 %). At the same time, 35,6 % of respondents believe that artificial intelligence should be entrusted with law enforcement functions, 46,0 % — development and improvement of legislation, 54,9 % — consideration of case in cour[74]. Such indicators indicate positive expectations and support for the implementation of artificial intelligence in the activities of law enforcement agencies and the judiciary.

The prerequisite for the introduction of artificial intelligence in Ukraine is the start of the Unified Judicial Information and Telecommunication System (hereinafter referred to as *UJITS*) [75] — a set of information and telecommunication subsystems (modules) that ensure the automation of the processes of the courts, bodies and institutions in the justice system.

UJITS modules:

- official web portal *"Judiciary of Ukraine"*;
- unified state register of court decisions;
- official email address (*"Electronic Cabinet"*);
- unified subsystem for managing financial and economic processes;
- single contact center of the judiciary of Ukraine;
- *"Automated distribution"*;
- *"Electronic court"*;
- *"Court statistics"*.

The system of automated seizure of funds within the scope of executive proceedings should also be part of the UJITS,

73 Експертний комітет з питань розвитку сфери штучного інтелекту при Міністерстві цифрової трансформації України. URL: http://ai.org.ua/ua.html (date accessed:19.10.2022).

74 Майже 50 % українців вважають, що штучний інтелект може допомогти забезпечити чесні вибори і перемогти корупцію,— опитування / LB.ua. 11.12.2018. URL: https://lb.ua/news/2018/12/11/414638_pochti_50_ukraintsev_schitayut.html (date accessed:10.11.2022).

75 ЄСІТС / Вища рада правосуддя. URL: https://hcj.gov.ua/page/yesits (date accessed:10.11.2022).

the administrator of which will have access to the information of the Unified State Demographic Register. In general, the implementation of such a system involves the use of an electronic digital signature and electronic document management (that is, completely paperless record keeping). Today, three of its modules are functioning in test mode *("Electronic cabinet", "Electronic court"* and the video conferencing subsystem) [76].

At the same time, it is important to note that the full implementation of this system is a matter of more than one year. Currently, only some courts operate separate modules, and electronic claims have to be duplicated in paper form. This is caused by a number of problems of martial law, however, if the government's policy on digital transformation is activated, we can expect rapid development in this area and an increase in the efficiency and transparency of the work of Ukrainian courts. Therefore, the problems and prospects of introducing modern digital technologies and artificial intelligence tools are very relevant today [77] and require further study and practical steps in the direction of digitization and digitization of justice in Ukraine.

On the other hand, the full-scale armed aggression of the russian federation against Ukraine actualized the issue of creating a domestic system of military justice. Recommendations of the Committee of Ministers of the Council of Europe to member states CM/Rec(2010)4 *"On human rights in relation to military personnel"* (adopted at the 1077th meeting on February 24, 2010), the Convention on Human Rights and the precedent practice of the European human rights court, which has developed approaches to the functioning of military courts. Turning to this practice, which (among others) considered the issue of ensuring the right to a fair trial in the context of possible violations of Art. 6 of the Convention on Human Rights by military courts, makes it possible to synthesize key approaches that should be taken into account for the functioning of military courts in Ukraine [78]. Therefore, the analysis of the problems and prospects of the use of artificial intelligence in the justice system of our country, taking into account the work of the European Court of Human Rights, shows the perspective of introducing certain elements of digitalization into the judiciary of Ukraine, in particular, into the activities of military justice in wartime.

The question of whether artificial intelligence can replace a judge is also quite debatable and important [79]. Some lawyers

76 ЄСІТС / Вища рада правосуддя. URL: https://hcj.gov.ua/page/yesits (date accessed:10.11.2022).

77 Shepitko V. Yu., Shepitko M. V. The role of forensic science and forensic examination in international cooperation in the investigation of crimes. *Journal of the National Academy of Legal Sciences of Ukraine*. 2021. Vol. 28. Iss. 1. P. 179—186. DOI: 10.37635/jnalsu.28(1).2021.179-186 (date accessed: 10.11.2022).

78 Капліна О. В. Військова юстиція у фокусі Європейського суду з прав людини. *Науковий вісник публічного та приватного права*. 2022. Вип. 2. С. 181—191. DOI: 10.32844/2618-1258.2022.2.29 (date accessed:12.10.2022).

79 Кібенко О. Чи може штучний інтелект замінити українського суддю? / Протокол. Юридичний інтернет-ресурс. 13.12.2019. URL: https://protocol.ua/ua/chi_moge_shtuchniy_intelekt_zaminiti_ukrainskogo_suddyu/ (date accessed:12.10.2022) ; Гришин-Грищук Р. Коли штучний інтелект замінить суддів в Україні? / NV. 27.03.2021. URL: https://biz.nv.ua/ukr/experts/koli-shtuchniy-intelekt-zaminit-suddiv-v-ukrajini-prognoz-50150409.html (date accessed:12.10.2022).

justify the need to use artificial intelligence as a cyber judge by the fact that it will make decisions like a person, only it will do it more quickly, consistently, without bribery, impartially and objectively [80]. We believe that such radical innovations require a thoughtful and balanced approach.

It should be noted that Art. 6 of the Human Rights Convention [81] enshrines the right to consider cases by an independent and impartial court. However, neither in Article 6 itself, nor in the commentaries to it, there is no direct prohibition of the use of artificial intelligence and no claim that justice should be administered only by a human judge. The Practice of the European Court on Human Rights in light of the violation of Art. 6 of the Human Rights Convention due to the use of artificial intelligence during decision-making is still missing. Domestic law details the norm of the Convention on Human Rights in Art. 127 of the Constitution of Ukraine, which stipulates that justice is administered by judges and that judicial power is vested in them. A similar legal position is contained in Art. 92 of the Basic Law of the Federal Republic of Germany [82].

Introduction of the idea of *"cyber courts"* is connected with the formalization, creation and offering of appropriate templates in the form of programs and algorithms [83], therefore, such an approach should not be contrasted with a creative approach and it should not deprive the trial of individuality and professional thinking, since the individuality and uniqueness of the trial of a specific criminal offense, administrative misdemeanor, civil dispute (on the one hand) and the inability to definitely typify all possible situations, tasks and proposals in relevant programs, algorithms, typical court decisions (on the other hand) does not allow us to claim complete *"technologicalness",* i.e. one hundred percent formalization of the trial process in general and the liability to objectively and legally resolve all court situations in particular. In this activity, a creative approach remains important, when the ability to adapt typical recommendations to the conditions of a specific court proceeding is more important, which is impossible without the participation and control of a human judge [84].

It is worth noting the idea that artificial intelligence systems in the activities

80 Токар Л. В. Штучний інтелект на варті справедливості: утопія чи перспектива людства. *Порівняльно-аналітичне право*. 2020. № 2. С. 275. URL: https://dspace.uzhnu.edu.ua/jspui/bitstream/lib/35614/1/%d0%a8%d0%a2%d0%a3%d0%a7%d0%9d%d0%98%d0%99%20%d0%86%d0%9d%d0%a2%d0%95%d0%9b%d0%95%d0%9a%d0%a2%20%d0%9d%d0%90%20%d0%92%d0%90%d0%a0%d0%a2%d0%86%20%d0%a1%d0%9f%d0%a0%d0%90%d0%92%d0%95%d0%94%d0%9b%d0%98%d0%92%d0%9e%d0%a1%d0%a2%d0%86.pdf (date accessed:19.10.2022).

81 Конвенція про захист прав людини … . URL: https://zakon.rada.gov.ua/laws/show/995_004#Text (date accessed:21.10.2022).

82 Baltrūnienė J., Shevchuk V. Artificial Intelligence Technologies in Law Enforcement and Justice: Ukrainian and European experience. *Цифрова трансформація кримінального провадження в умовах воєнного стану* : мат-ли Всеукр. круглого столу (Харків, 16.12.2022). Харків, 2022. С. 81.

83 Idder A., Coulaux S. Op. cit. URL: https://www.ibanet.org/dec-21-ai-criminal-justice (date accessed:12.10.2022).

84 Шевчук В. М. Перспективи запровадження технологій штучного інтелекту у судову діяльність в сучасних умовах. *Використання технологій штучного інтелекту …* . С. 89—90.

of criminal justice bodies are most often used to solve standard tasks. Decisions obtained as a result of such a solution can only have an advisory nature because the final procedural decision will still be made by an authorized person (even if the result of the artificial intelligence system will be marked by a higher level of quality). At the same time, complex artificial intelligence systems also have certain shortcomings, which, in turn, can lead to erroneous court decisions [85]. In addition, according to Art. 6 of the Human Rights Convention, the participant in the legal process must be informed in clear language about all procedural aspects, as well as about the capabilities and functions of artificial intelligence. In order to increase public awareness during the implementation of new systems, it is worth organizing public discussions, following the principle of *"under user control"*.

When applying high information technologies in the judiciary, it is necessary to take into account the principles of the use of artificial intelligence in the administration of justice set forth in the Ethical Charter [86] (in particular: the principle of observing basic human rights; the principle of non-discrimination, namely the prevention of any discrimination between individuals or groups of individuals; the principle of quality and security regarding the processing of court decisions and data in a secure technological environment; the principle of *"under user control"*; the principle of transparency, impartiality and fairness).

Therefore, in our opinion, *artificial intelligence cannot replace judges, but nothing prevents optimizing the work of the judge and the court by involving artificial intelligence.* Thus, it is appropriate to note that the role of artificial intelligence should be defined not as a replacement for the judge during the administration of justice, but as a kind of assistance for him to administer justice. In this case, electronic technologies should be controlled by a person, not the other way around. First of all, artificial intelligence must adhere to the principles of the rule of law, respect for honor and dignity, equality before the law and the court, proportionality, competition between the parties, dispositiveness, etc. [87]. Accordingly, this direction of research requires a deep understanding, a critical attitude and further scientific developments and investigations.

Issues of using artificial intelligence in law enforcement

Recently, the use of artificial intelligence technologies in the practice of law enforcement has become extremely relevant: this is due to the need to confront criminals who increasingly using the most modern innovative technologies and achievements of the fourth industrial revolution, in particular, blockchain models, drones, robotics, etc.

Law enforcement of Ukraine, significantly increasing the efficiency of their work and optimizing the solution of crime prevention tasks, are actively using the following artificial intelligence technologies:

85 Авдєєва Г. К. Op. cit. С. 6—10.

86 European ethical Charter … . URL: https://rm.coe.int/ethical-charter-en-for-publication-4-december-2018/16808f699c (date accessed:16.10.2022).

87 Кожевнікова А. В. Застосування штучного інтелекту у цивілістичному процесі. *Науковий вісник Міжнародного гуманітарного університету. Сер.: Юриспруденція*. 2022. № 55. С. 42. DOI: 10.32841/2307-1745.2022.55.9 (date accessed:12.10.2022).

- identification (in particular, of the Russian occupiers) thanks to facial recognition on social networks and records from surveillance cameras [88];
- ensuring traffic, detecting and recording violations of traffic rules [89];
- use of drones to counter the illegal trafficking of firearms and drugs [90], to conduct military operations [91] and to collect evidentiary information in war conditions and conduct active combat operations with the aim of recording war crimes;
- prevention of criminal offenses using intelligent security systems with various devices (sensors) for collecting information [92];
- prediction of criminal offenses by the method of crime mapping [93] (by means of which local crime and individual criminal behavior are predicted).

For instance, thanks to artificial intelligence technologies, it is possible to make reasonable forecasts regarding the temporal, territorial and qualitative indicators of crime, which will optimize the use of available resources by law enforcement agencies and the performance of police functions [94]. In addition, with the help of artificial intelligence technologies, it is possible to identify Russian military personnel from social networks and surveillance cameras [95]. Artificial intelligence destroys the myths about the supposedly immortal soldiers of the so-called special operation, recognizing the faces of the corpses of the occupiers, finding them on social networks and using auto-dialers to notify relatives of their death. The Ministry of Defense of Ukraine uses *Clearview AI*

88 Kryvoruchko O., Bebeshko B., Khorolska K., Desiatko A., Kotenko N. Artificial intelligence face recognition for authentication. *Technical Sciences and Technology*. 2020. № 2 (20). Pp. 139—148. URL: http://tst.stu.cn.ua/article/view/215780 (date accessed:12.10.2022).

89 Мисливий В. А. Штучний інтелект як фактор запобігання дорожньо-транспортної злочинності. *Використання технологій штучного інтелекту …* . С. 55—60.

90 Мовчан А. В., Мовчан М. А. Використання безпілотних літальних апаратів у діяльності правоохоронних органів. *Соціально-правові студії*. 2020. Вип. 3 (9). С. 104—110. DOI: 10.32518/2617-4162-2020-3-104-110 (date accessed:12.10.2022).

91 Мосов С. П., Хорошилова С. Й. Особливості застосування стратегічної безпілотної розвідувальної авіації у воєнних конфліктах XXI століття. *Збірник наукових праць Центру воєнно-стратегічних досліджень Національного університету оборони України імені Івана Черняховського*. 2018. № 2 (63). С. 104—109. URL: http://nbuv.gov.ua/UJRN/Znpcvsd_2018_2_19 (date accessed:17.11.2022).

92 Бугера О. І. Використання штучного інтелекту для запобігання злочинності. *Вчені записки ТНУ імені В. І. Вернадського. Серія: юридичні науки*. 2021. Т. 32 (71). № 6. С. 82—86. DOI: 10.32838/TNU-2707-0581/2021.6/13 (date accessed:17.11.2022).

93 Манжай О. В., Потильчак А. О. Особливості картографування злочинних проявів. *Право і безпека*. 2020. № 4 (79). С. 66—72. DOI: 10.32631/pb.2020.4.10 (date accessed:17.11.2022).

94 Юртаєва К. В. Використання технологій штучного інтелекту в реалізації стратегій «predictive policing»: можливості, проблеми та перспективи для України. *Використання технологій штучного інтелекту …* . С. 99—104.

95 Латиш К. Цифрова криміналістика у період війни в Україні: можливості використання спеціальних знань у сфері інформаційних технологій. *Kriminalistika ir teismo ekspertologija* : *mokslas, studijos, praktika*. 2022. T. 18. C. 32. URL: https://repository.mruni.eu/bitstream/handle/007/18524/XVIII%20Vilnius%202022_compressed-18-21.pdf?sequence=1&isAllowed=y (date accessed:17.11.2022).

facial recognition technology to combat disinformation, recognize and identify dead and war criminals [96]. As we can see, in the realities of military aggression, digital forensics tools significantly contribute to the detection, disclosure and investigation of war crimes [97].

Therefore, the use of artificial intelligence in law enforcement activities is an important tool for improving the efficiency of law enforcement agencies thanks to the development and implementation of the latest digital technologies in the following main areas:

1) *information and analytical support of law enforcement activities* (for example, the information and telecommunication system *"Information Portal of the National Police of Ukraine"* is intended for processing information generated in the process of police activities and information and analytical support of such activities) [98];
2) *information and reference provision of law enforcement activities* (in particular, the use of maps or plans for the formation of geo-information systems for the spatial location of objects);
3) *creation of specialized information intelligence systems* for operational and investigative purposes (for example, development and implementation of an automated system for conducting operational and investigative activities and covert investigative (detective) actions in telecommunications networks of general use (similar to the American *Eshelon* and *DCS-1000 (Carnivore)* and the European *RES* system);
4) *formation and development of intelligent video surveillance systems* by two functional groups: a) recognition and classification of video surveillance objects; b) tracking the path of the video surveillance object);
5) *ensuring the protection of objects* (for example, by the systems *"Orlan", "Kronos", "AI-Gryphon",* etc., which are complexes of technical means and software for centralized monitoring of the state of security and fire alarm devices);
6) *creation of departmental specialized intelligent information systems* (for example, for the police — automated dactyloscopic information systems: Ukrainian *"Dakto-2000"*, French *MORFO*, American *PRINTRAK*, Japanese *NEX* etc.; for Boarder Guard Service — integrated information and telecommunication systems *"Arkan"* and *"Gart"*; for Customs Service — multifunctional complex information system *"Electronic Customs"*);
7) *development and implementation of intellectual information educational systems* (in particular, modeling of knowledge, communication, interpretation, self-improvement, interaction [99]);

96 Федоров М. Технології з розпізнавання облич та штучний інтелект дозволяють знайти кожного / SUNDRIES. 09.04.2022. URL: https://sundries.com.ua/tekhnolohii-z-rozpiznavannia-oblych-ta-shtuchnyi-intelekt-dozvoliaiut-znaity (date accessed:12.10.2022).

97 Мамедов Г. Цифрова криміналістика. Як це допомогло зібрати докази злочинів у Бучі? / New Voice. 08.06.2022. URL: https://nv.ua/ukr/opinion/viyna-v-ukrajini-yak-cifrova-kriminalistika-vikrivaye-zlochini-rf-v-ukrajini-novini-ukrajini-50248411.html (date accessed:12.10.2022).

98 Положення про інформаційно-комунікаційну систему «Інформаційний портал Національної поліції України» : затв. наказом МВС України від 03.08.2017 р. № 676 (зі змін. та допов.). URL: https://zakon.rada.gov.ua/laws/show/z1059-17#Text (date accessed:04.10.2022).

99 Ковтун В. О., Рвачов О. М. Огляд та перспективи використання технологій штучного інтелекту в правоохоронній діяльності. *Використання технологій штучного інтелекту …* . С. 46—47.

8) *introduction of information and telecommunication system of pre-trial investigation* [100] as an important step in the improvement of investigative (detective) activity (the use of artificial intelligence will significantly save time, money, means, resources; it will shorten the terms of consideration of relevant procedural documents; it will simplify the access of participants within their competence to the relevant materials of criminal proceedings, digitization of document flow, etc. [101]).

It is important to note: European practice and experience indicate that law enforcement agencies must be able to act in the changing modern conditions of the transformation of crime in order to ensure the protection and safety of citizens [102]. To implement the competences of law enforcement agencies, programs and algorithms created by elements of artificial intelligence are used. In addition, institutions performing law enforcement functions have various types of systems, the components of which are artificial intelligence algorithms [103].

The use of artificial intelligence in the investigation of war crimes and issues of the formation of digital forensics

Modern forensics corresponds to the development of digital technologies creating means and methods of extracting forensically significant information from new types of media. The development of scientific and technical progress makes it possible to use digital technologies in law enforcement activities, which increases the efficiency and accelerates the process of pre-trial investigation, contributes to a more complete formation of the evidence base in the investigation of criminal offenses, and this, in turn, improves the quality of consideration of criminal proceedings in court. Under such conditions, the defining trend of criminology is the integration of knowledge and the application of the latest, innovative scientific developments aimed at combating crime. The natural result of the informatization of the social environment is the *"technologicalization"* of forensics, the development and implementation of information,

100 Про внесення змін до Кримінального процесуального кодексу України щодо запровадження інформаційно-телекомунікаційної системи досудового розслідування : Закон України від 01.06.2021 р. № 1498-IX. URL: https://zakon.rada.gov.ua/laws/show/1498-20#Text (date accessed:18.10.2022).

101 Глобенко Г. І. Інформаційно-телекомунікаційна система досудового розслідування: міжнародний досвід і шляхи запровадження. *Вісник Харківського національного університету внутрішніх справ*. 2021. Т. 95. № 4. С. 188—198. DOI: 10.32631/v.2021.4.16 (date accessed:18.10.2022).

102 Europos Komisija „Priedas prie Komisijos komunikato Europos Parlamentui, Europos Vadovų Tarybai, Tarybai, Europos ekonomikos ir socialinių reikalų komitetui ir Regionų komitetui Europos požiūrio į dirbtinį intelektą formavimas" / EUR-Lex, 2018 m. balandžio 25 d., 237 galutinis, žiūrėta 2023 m. URL: https://eurlex.europa.eu/legal-content/LT/TXT/?uri=COM:2018:237:FIN (date accessed:16.10.2022).

103 Europos Komisija, „Feasibility study on a forecasting and early warning tool for migration based on artificial intelligence technology" / Europos Sąjungos leidinių biuras Ecorys, 2021 m. vasario 15 d., žiūrėta 2023 m. URL: https://op.europa.eu/lt/publication-detail/-/publication/5afa29f0-700a-11eb-9ac9-01aa75ed71a1/languageen/format-PDF/source-191372680 (date accessed:16.10.2022).

digital, telecommunication and other technologies in law enforcement practice and judicial proceedings [104].

In the conditions of war and global threats, all practitioners in the field of international criminal justice need to expand their understanding of the essence of the latest digital technologies (for example, in social networks, geolocation and mobile communication systems, computer information and in the rest of digital traces) and the possibilities of their application in war zones [105]. Taking into account the mass murders, rapes, looting, etc. committed by the Russian military on the territory of Ukraine, today the problem of collecting evidence of these crimes has become acute, which requires the activation and spread of the use of artificial intelligence for the purpose of detecting, documenting and investigating war crimes, crimes against humanity and genocide [106].

The use of artificial intelligence in the investigation of war crimes in Ukraine can be useful in many aspects, in particular in the following directions:

1) *analysis of satellite images.* Artificial intelligence is able to quickly detect changes in the landscape, in particular buildings, roads, infrastructure objects that can be associated with war crimes, as well as help in identifying the burial places of victims of war crimes;
2) *analysis of video&photo materials.* Artificial intelligence can be used to identify objects, suspects and witnesses from video and photo materials made at war crimes sites;
3) *processing of audio materials.* By recording, for example, telephone conversations, artificial intelligence can help identify voices and determine the location of subscribers during such a conversation;
4) *analysis of social networks.* By analyzing social networks, artificial intelligence can help identify links between suspects who may be associated with war crimes and identify individuals who may witness or have information about war crimes;
5) *analysis of data from medical institutions.* Artificial intelligence can assist in determining the cause of death, in identifying the bodies of victims of war crimes, as well as prisoners of war, and war criminals and their search for data on the disease and information about their identification characteristics in order to identify a specific person;
6) *face recognition.* Artificial intelligence can be used to recognize faces in photos and videos of war crimes. This can help identify suspects involved in the commission of such crimes and find witnesses who can provide important information about the war crime event under investigation;
7) *analysis of textual information.* Artificial intelligence analysis of textual information (for example, messages on social networks and other sources) related to war crimes will help identify suspects and witnesses and find out criminalistically significant information about war crimes under investigation.

104 Шепітько В. Ю. Формування доктрини криміналістики та судової експертизи в Україні — шлях до єдиного європейського криміналістичного простору. *Право України.* 2022. № 2. С. 83.

105 Freeman L. Op. cit. P. 335. URL: https://ir.lawnet.fordham.edu/ilj/vol41/iss2/1 (date accessed:12.10.2022).

106 Дуфенюк О. Op. cit. DOI: 10.30525/2592-8813-2022-1-6 (date accessed:12.10.2022).

Thus, the use of artificial intelligence can be useful for effective investigation of war crimes in Ukraine and help to identify the perpetrators and bring them to justice for what they have done. However, it should be noted that the use of artificial intelligence in the investigation of war crimes has its challenges and limitations. One of the biggest challenges is that during the war it is difficult to obtain reliable information due to the high degree of conflict and unpredictability of the situation on the spot. There is also the risk of using artificial intelligence to persecute political opponents or incorrectly display data due to certain algorithmic imperfections. In addition, it is important to take into account legislative restrictions on the use of artificial intelligence to investigate crimes (in particular, the ban on the use of certain types of data that may violate human rights). All these factors require careful analysis and planning before using artificial intelligence to investigate war crimes. At the same time, artificial intelligence is a powerful tool for investigating war crimes in Ukraine, capable of promoting the victory of justice and bringing those responsible to justice.

The use of artificial intelligence and modern digital technologies in military realities makes it possible to significantly increase the efficiency and speed up the investigation of war crimes and cybercrimes. It is known that almost any activity of people (in particular, criminals and their groups) in the modern world is accompanied by a kind of *"trace picture"*, a special place in which digital traces occupy [107] as an important source of criminalistically significant information. It is digital, not electronic traces, that today form the basis of the evidence base during the investigation of such criminal offenses. In digital footprints (despite the ever-changing form of information storage), one thing remains constant — it is a digital encoding of information that has given way to an analog signal. With this in mind, it is worth talking about digital traces left in virtual space.

Application of European standards of proof in criminal proceedings testifies to the European vector of development of criminalistics and forensic examination in Ukraine [108]. In such circumstances, it can be argued about the activation of trends in the formation and application of a new scientific direction — Digital Criminalistics [109].

In the special literature, there are different approaches to the definition of the concept of digital criminalistics and its place in the system of criminology and judicial sciences. Some scientists call digital criminalistics a separate branch of the judicial sciences, a system of scientific methods for researching digital evidence in order to facilitate the detection and investigation of criminal offenses [110].

107 Крицька І. О. «Доріжка цифрових слідів»: доказове значення й окремі аспекти збирання та дослідження у кримінальному провадженні. *Цифрові трансформації України 2020: виклики та реалії* : зб. наук. пр. НДІ ПЗІР НАПрН України № 1 за мат-ми кругл. столу (Харків, 18.09.2020). Харків, 2020. С. 92—97. URL: https://ndipzir.org.ua/wp-content/uploads/2020/12/Tezy_18_09_2020_17.pdf (date accessed:12.10.2022).

108 Шепітько В. Ю. Формування доктрини … . С. 87.

109 Латиш К. Op. cit. С. 31—37. URL: https://repository.mruni.eu/bitstream/handle/007/18524/XVIII%20Vilnius%202022_compressed-18-21.pdf?sequence=1&isAllowed=y (date accessed:17.11.2022).

110 Степанюк Р. Л., Перлін С. І. Op. cit. DOI: 10.33766/2524-0323.99.283-284 (date accessed:17.10.2022).

Others believe that digital criminalistics is associated with the process of collecting, obtaining, storing, analyzing and submitting electronic (digital) evidence in order to obtain operational-search information, evidentiary information and the investigation and criminal prosecution of various types of criminal [111] (in particular, cybercrimes and war crimes). Some sources note that digital criminalistics concerns the process of collecting, receiving, storing, analyzing and presenting electronic (digital) evidence in pre-trial and trial proceedings. Therefore, digital forensics should become a strategic direction in the development of forensic science.

According to our opinion, the subject of digital criminalistics is the laws of detection, fixation, preliminary research, the use of computer information, digital traces and means of their processing in order to solve the problems of detecting, disclosing, investigating and preventing criminal offenses, as well as the development (based on knowledge of these laws) of technical means, techniques and methodological recommendations aimed at optimizing activities to counter criminal offenses in the digital space. Thus, digital criminalistics is a branch of criminalistics, which studies the patterns of occurrence and use of digital traces, development on the basis of knowledge about these patterns of technical means, techniques and methods for identifying, fixing, extracting and studying digital information (evidence) and means of its processing in order to disclose, investigate and prevent criminal offenses [112].

During the war, the arsenal of traditional forensic tools and forms of collecting evidence on war crimes is quite limited due to the danger to all participants of investigative (search) actions and the impossibility of direct access to the scene [113], thus, there is a need to use digital forensic tools.

Modern approaches to the investigation of war crimes make it possible to determine the sources of digital information, which determine the directions of collecting and studying digital traces to obtain information:

- from mobile devices seized from participants in criminal proceedings;
- from personal computers of individuals and legal entities;
- from servers and other information storage devices in organizations and institutions;
- from radio frequency identifiers, *GPS*-tackers, sensors, stationary and mobile measuring devices using geolocation, video surveillance and positioning systems;
- from network services that provide voice and video communication between computers via the Internet (*ICQ, Skype, WhatsApp, Viber, Telegram* and others);
- from banking systems on digital media (*HDD, SSD*, flash drives, etc.);

111 Колодіна А. С., Федорова Т. С. Op. cit. DOI: 10.32782/klj/2022.1.27 (date accessed:12.10.2022).

112 Шевчук В. М. Цифрова криміналістика: воєнні виклики сьогодення та нові завдання у сучасних умовах. *Правові виклики сучасності* : мат-ли Всеукр. круглого столу (Харків, 20.12.2022). Харків, 2022. С. 35—39.

113 Дуфенюк О. Розслідування воєнних злочинів: логістичні, криміналістичні та судово-медичні питання. *Юридичний науковий електронний журнал*. 2022. № 4. С. 369—374. DOI: 10.32782/2524-0374/2022-4/88 (date accessed:17.11.2022).

- from mobile operators regarding the details of subscriber communication and determining the location of the subscriber using geolocation;
- from recordings of surveillance cameras of commercial and state structures;
- from cameras and video cameras seized from participants in criminal proceedings.

No less important in today's conditions of the active spread of digital technologies is the connection between the application of specific expertise during the collection of digital traces, the possibilities of forensic research, the evaluation and use of the results of examinations in proving and transforming the competencies of forensic experts in most types of forensic examinations [114]. Today, objects in digital form are submitted for examination both on individual data carriers and in the form of complete computer systems, therefore, in order to legally obtain digital traces, it is necessary to use appropriate specific expertise and to appoint and conduct forensic computer-technical examination and examinations of telecommunication systems and means (research of digital and analog devices) [115].

We consider that the application of artificial intelligence and the process of digitization of forensics is a natural stage in the development and formation of modern forensic knowledge, which involves the introduction of digital technologies in various fields of forensic science, forensic expertise and legal practice, which requires further research into the issues of digital criminalistics. Particular attention should be paid to increasing the role of forensic didactics [116], in particular to the forensic training of investigators, prosecutors, judges, detectives, forensic investigators, forensic experts in the field of digital technologies. It's time to start a new profession and train a digital *forensic scientist* [117]. Under such circumstances, it is expedient to direct the modern paradigm of criminology to the formation and further development of digital criminalistics in order to effectively solve new tasks in the conditions of martial law and the digitalization of society.

Conclusions

As an integral attribute of the modern activity of criminal justice bodies, digital information determines the prospects and trends of the development of criminology. In today's realities, an important task of criminology is the development and application of innovative means, techniques and methods that allow for the effective collection, research, and use of various (in particular, digital) evidence

114 Zhuravel V. A., Konovalova V. E., Avdeyeva G. K. Reliability Evaluation of a Forensic Expert's Opinion: World Practices and Ukrainian Realities. *Вісник Національної академії правових наук України*. 2021. Vol. 28. No. 2. Pp. 252—261. DOI: 10.37635/jnalsu.28(2).2021.252-261 (date accessed:17.11.2022).

115 Шепітько В., Шепітько М. Доктрина криміналістики та судової експертизи: формування, сучасний стан і розвиток в Україні. *Право України.* 2021. № 8. С. 12—27.

116 Malevski H., Kurapka V. E., Tamelė I. Motivation and expectations of students — an important factor in the implementation of the new bachelor's degreeprogram "Law and Criminalistics". *The Criminalist of the First Printing.* 2021. № 21—22. Pp. 12—26.

117 Шевчук В. М. Цифрова криміналістика: формування та роль у забезпеченні безпекового середовища України. *Нова архітектура безпекового середовища України* : зб. тез Всеукр. наук.-практ. конф. (Харків, 23.12.2022). Харків, 2022. С. 146—150.

in pre-trial investigation and court proceedings. That is why the question of increasing the role of forensic knowledge is urgent because the issue of applying artificial intelligence technologies in the activities of law enforcement and justice bodies is of particular importance and requires special scientific research in view of European experience and modern practice. The formation of a new field of knowledge — digital forensics as a strategic direction in the development of modern forensic science — is urgent.

At the same time, a significant problem in the case of the use of artificial intelligence technologies during the investigation of offenses is a possible violation of human rights (regarding the protection of personal data confidentiality and interference in private life). Therefore, it is important not to exaggerate the potential and advantages of artificial intelligence: it is worth considering its individual shortcomings. We see that the use of artificial intelligence in judicial proceedings and law enforcement activities is permissible only under the condition of mandatory observance of the principles of the rule of law, basic human rights, respect for honor and dignity, equality before the law and the court, proportionality, competition between the parties, transparency, impartiality and justice etc. As of today, it is impossible to completely replace the judge with artificial intelligence in the administration of justice, on the other hand, there are no legal prohibitions on optimizing the work of the judge and the court by involving artificial intelligence technologies. Therefore, the leading role of artificial intelligence is not to replace the judge in the administration of justice, but only a kind of high-tech assistance. In addition, in order to prevent the uncivilized (illegal) use of artificial intelligence, it is necessary to form a global (mandatory) international legal framework for its development and implementation. Governments and private companies must be aware of the imperfection of the raw data and technologies on which artificial intelligence is based, and therefore take care to prevent discrimination and human rights violations. It is advisable to direct further research to the development of issues related to the development and use of artificial intelligence as a component of information technologies in law enforcement and justice in view of international experience and modern practice.

Штучний інтелект в діяльності органів правопорядку та юстиції: вітчизняний та європейський досвід

Сніґоля Матуелєне, Віктор Шевчук, Юрґіта Балтрунене

Мета статті — дослідити актуальні проблеми застосування технологій штучного інтелекту в діяльності органів правопорядку та юстиції в умовах воєнного стану і глобальних загроз; визначити основні тенденції, проблеми й перспективи криміналістичних досліджень із використанням штучного інтелекту крізь призму євроінтеграційних процесів; висвітлити прогалини в нормативно-правовому регулюванні використання цифрових технологій, окреслити напрями його вдосконалення. Для досягнення поставленої мети застосовано загальнонаукові та спеціальні методи наукового дослідження (зокрема, діалектичний, аналітичний, індукції й дедукції та ін.). Проаналізовано вітчизняний і європейський досвід застосування технологій штучного інтелекту в діяльності органів правопорядку та юстиції, визначено їхні перспективні напрями.

Убачаємо, що правове регулювання використання штучного інтелекту в Україні доцільно здійснювати за європейськими стандартами, правилами й рекомендаціями — згідно з обраним нашою державою євроінтеграційним курсом. Зауважено, що запровадження штучного інтелекту в судочинство має передусім ґрунтуватися на принципах верховенства права, дотримання основних прав людини, поваги до честі й гідності, рівності перед законом і судом, пропорційності, змагальності сторін, прозорості, неупередженості та справедливості. Штучний інтелект не здатний цілком замінити суддів, однак його застосування сприятиме оптимізації роботи судді й суду. Обґрунтовано, що у воєнних реаліях сьогодення гостро постало питання про підвищення ефективності розслідування сучасних воєнних злочинів і кіберзлочинів за допомогою цифрових технологій.

Ключові слова: *штучний інтелект; криміналістика; криміналістичні знання; спеціальні знання; цифрова криміналістика; судова експертиза; цифрові докази; розслідування воєнних злочинів; протидія злочинності; тенденції розвитку криміналістики.*

Financing
This research has not received any specific grants from funding institutions in state, commercial or non-profit sectors.
Disclaimer
The founders played no role in creation of the research, selection and analysis of data, decision to publish or prepare the manuscript.
Participant
The authors have contributed exclusively to the intellectual discussion that is the basis of this document, the study of judicial practice, writing and editing, and take responsibility for its content and interpretation.
Conflict of Interests
The authors declare no conflict of interest related to this topic; although Viktor Shevchuk is a member of the Collection's Advisory Board, he was not involved in the publication decision, and this article has undergone a full peer review and editing process.

References

A definition of Artificial Intelligence: main capabilities and scientific disciplines / European Commission. 08 April 2019. URL: https://digital-strategy.ec.europa.eu/en/library/definition-artificial-intelligence-main-capabilities-and-scientific-disciplines.

Ackermann, V. R., Kurapka, V. E., Malewski, H., Shepitko, V. (2020). Schaffung eines einheitlichen europaisehen Kriniinalistischen Raumes: Die Tatigkeit offentlicher Organisationen zur Starkung der internationalen Beziehungen. *Kriminalistik*. Is. 6.

Avdieieva, H. K. (2020). Problemy vykorystannia system shtuchnoho intelektu v roboti orhaniv kryminalnoi yustytsii [Issues of using artificial intelligence systems in the work of criminal justice bodies]. *Vykorystannia tekhnolohii shtuchnoho intelektu u protydii zlochynnosti* : mat-ly nauk.-prakt. onlay-seminaru (Kharkiv, 05.11.2020). Kharkiv [in Ukrainian].

Baltrūnienė, J. (2022). Dirbtinis intelektas ir duomenų apsauga kriminalistikos plėtros kontekste / *Kriminalistikos teorijos plėtra ir teismo ekspertologijos ateitis: liber amicorum profesoriui Egidijui Vidmantui Kurapkai*. Kolektyvinė monografija. Vilnius, 2022 [in Lithuanian].

Baltrūnienė, J., Shevchuk, V. (2022). Artificial Intelligence Technologies in Law Enforcement and Justice: Ukrainian and European experience. *Tsyfrova transformatsiia kryminalnoho provadzhennia v umovakh voiennoho stanu* : mat-ly Vseukr. kruhloho stolu (Kharkiv, 16.12.2022). Kharkiv.

Baranov, O. (2018). Identyfikatsiia robota zi shtuchnym intelektom yak subiekta prava [Identification of robot with artificial intelligence as a subject of law]. *Internet*

rechey: problemy pravovoho rehuliuvannia ta vprovadzhennia : mat-ly druh. nauk.-prakt. konf. (Kyiv, 29.11.2018). Kyiv, 2018. URL: http://ippi.org.ua/sites/default/files/zbirnik_tez_19.12.2018-maket_3-converted.pdf [in Ukrainian].

Baranov, O. A. (2018). *Internet rechey: teoretyko-metodolohichni osnovy pravovoho rehuliuvannia. T. 1: Sfery zastosuvannia, ryzyky i bariery, problemy pravovoho rehuliuvannia* [Internet of things: theoretical and methodological foundations of legal regulation. V 1: Fields of application, risks and barriers, problems of legal regulation]: monohrafiia. Kharkiv [in Ukrainian].

Baranov, O. A. (2019). Pravovi aspekty natsionalnykh stratehiy rozvytku shtuchnoho intelektu [Legal aspects of national strategies for the development of artificial intelligence]. *Yurydychna Ukraina*. № 7 [in Ukrainian].

Bilous, V. V. (2016). Rol zasobiv kryminalistyky u protydii kiberzlochynnosti [Role of forensic tools in countering cybercrime]. *Mizhnarodni standarty z kiberbezpeky ta ikh zastosuvannia v Ukraini* : mat-ly «kruhl. stolu» (Kharkiv, 19.04.2016). Kharkiv. URL: http://dspace.nlu.edu.ua/handle/123456789/10885 [in Ukrainian].

Bugera, O. I. (2021). Use of artificial intelligence to prevent crime. *Scientific notes of Taurida National V. I. Vernadsky University. Series: Juridical Sciences.* T. 32 (71). № 6. DOI: 10.32838/TNU-2707-0581/2021.6/13 [in Ukrainian].

Chalabiieva, M. R. (2021). Pozytyvnyi dosvid tsyfrovizatsii krain Yevropeiskoho Soiuzu [Positive experience of digitalization of the countries of the European Union]. *Ukraina i Yevropeiskyi Soiuz: shliakh do staloho rozvytku* : zb. nauk. st. za mat-lamy V Vseukr. nauk.-prakt. konf. z yevrop. prava (Kharkiv, 12.11.2021). Kharkiv. URL: https://ndipzir.org.ua/wp-content/uploads/2021/11/Conf_12.11.21.pdf [in Ukrainian].

Chornous, Yu. M. (2017). *Kryminalistychne zabezpechennia rozsliduvannia zlochyniv* [Forensic support for the investigation of crimes]: monohrafiia. Vinnytsia. URL: http://elar.naiau.kiev.ua/handle/123456789/16029 [in Ukrainian].

Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions — Coordinated Plan on Artificial Intelligence (COM(2018) 795 final) / European Commission. URL: https://digital-strategy.ec.europa.eu/en/library/coordinated-plan-artificial-intelligence.

Communication from the commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. Artificial Intelligence for Europe. (COM/2018/237 final). Brussels, 25.4.2018 / EUR-Lex. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2018:237:FIN.

Domashenko, O. M. (2019). Problemni pytannia vykorystannia tsyfrovykh dokaziv u kryminalistytsi [Problematic issues of using digital evidence in forensics]. *Innovatsiini metody ta tsyfrovi tekhnolohii v kryminalistytsi, sudovii ekspertyzi ta yurydychnii praktytsi* : mat-ly mizhnar. «kruhl. stolu» (Kharkiv, 12.12.2019). Kharkiv. URL: https://ivpz.kh.ua/wp-content/uploads/2020/01/%D0%97%D0%B1%D1%96%D1%80%D0%BD-%D0%9A%D1%80%D1%83%D0%B3%D0%BB%D0%B8%D0%B9-%D1%81%D1%82%D1%96%D0%BB_%D0%86%D0%BD%D0%BD%D0%BE%D0%B2%D0%B0%D1%86%D1%96%D0%B9%D0%BD%D1%96-%D0%BC%D0%B5%D1%82%D0%BE%D0%B4%D0%B8_2019-%D0%97%D0%B1%D1%96%D1%80%D0%BD%D0%B8%D0%BA.pdf [in Ukrainian].

Dufeniuk, O. (2022). Investigation of war crimes in Ukraine: challenges, standards,

innovations. *Baltic Journal of Legal and Social Sciences*. № 1. DOI: 10.30525/2592-8813-2022-1-6 [in Ukrainian].

Dufeniuk, O. M. (2022). War crimes investigation: logistics, forensic science and medical issues. *Yurydychnyi naukovyi elektronnyi zhurnal*. № 4. DOI: 10.32782/2524-0374/2022-4/88 [in Ukrainian].

Dumchykov, M. (2020). The processes of digitization and forensics: a retrospective analysis. *Criminalistics and Forensics*. No 65. DOI: 10.33994/kndise.2020.65.10 [in Ukrainian].

European ethical Charter on the use of Artificial Intelligence in judicial systems and their environment. Adopted at the 31st plenary meeting of the CEPEJ (Strasbourg, 3—4 December 2018) / Council of Europe. URL: https://rm.coe.int/ethical-charter-en-for-publication-4-december-2018/16808f699c.

European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL)). *Official Journal of the European Union*. 18.7.2018. URL: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017IP0051&rid=9.

Europos Komisija „Priedas prie Komisijos komunikato Europos Parlamentui, Europos Vadovų Tarybai, Tarybai, Europos ekonomikos ir socialinių reikalų komitetui ir Regionų komitetui Europos požiūrio į dirbtinį intelektą formavimas“ / EUR-Lex, 2018 m. balandžio 25 d., 237 galutinis, žiūrėta 2023 m. URL: https://eurlex.europa.eu/legal-content/LT/TXT/?uri=COM:2018:237:FIN.

Europos Komisija „Feasibility study on a forecasting and early warning tool for migration based on artificial intelligence technology“ / Europos Sąjungos leidinių biuras Ecorys, 2021 m. vasario 15 d., žiūrėta 2023 m. URL: https://op.europa.eu/lt/publication-detail/-/publication/5afa29f0-700a-11eb-9ac9-01aa75ed71a1/languageen/format-PDF/source-191372680.

Fedorenko, O. A., Striltsiv, O. M., Tarasenko, O. S. (2022). *Vykorystannia tekhnolohii shtuchnoho intelektu u pravookhoronnii diialnosti. Analitychnyi ohliad* [Use of artificial intelligence technologies in law enforcement activities: Analytical review]. Kyiv [in Ukrainian].

Freeman, L. (2018). Digital Evidence and War Crimes Prosecutions: The Impact of Digital Technologies on International Criminal Investigations and Trials. *Fordham International Law Journal*. No. 41. Is. 2. URL: https://ir.lawnet.fordham.edu/ilj/vol41/iss2/1.

Hlobenko, H. I. (2021). Information and telecommunication system of pre-trial investigation: international experience and ways of implementation. *Bulletin of Kharkiv National University of Internal Affairs*. No 95(4). DOI: 10.32631/v.2021.4.16 [in Ukrainian].

Idder, A., Coulaux, S. (2021). *Artificial intelligence in criminal justice: invasion or revolution?* / International Bar Association. 13.12.2021. URL: https://www.ibanet.org/dec-21-ai-criminal-justice.

Jackson, C. (2021). Artificial Intelligence Changing the World of Forensics Science. *EasyChair Preprint*. No. 5815. URL: https://easychair.org/publications/preprint/1Fmk.

Kaplina, O. V. (2022). Military justice in the focus of the European Court of human rights. *Scientific Bulletin of Public and Private Law*. No 2. DOI: 10.32844/2618-1258.2022.2.29 [in Ukrainian].

Karmaza, O. O., Fedorenko, T. V. (2021). Principles of artificial intelligence in the justice of Ukraine. *Law and Society*. № 2. DOI: 10.32842/2078-3736/2021.2.3 [in Ukrainian].

Karmaza, O., Koucherets, D. (2021). Artificial intelligence in the civil process: prospects for use. *The latest development of the modern legal sciences and education*

in Ukraine and EU countries: an experience, challenges, expectations : collective monograph. Riga. DOI: 10.30525/978-9934-26-033-9-14.

Kohutych, I. (2020). Some challenges of forensic science and the methods of its formation. *Criminalistics and Forensics*. Vyp. 65. DOI: 10.33994/kndise.2020.65.01 [in Ukrainian].

Kohutych, I. I. (2021). Zastosuvannia tsyfrovykh tekhnolohiy — novyy napriam kryminalistyky [Application of digital technologies — a new direction of forensics]. *Naukovi chytannia pamiati Hansa Hrossa* : zb. tez mizhnar. nauk.-prakt. konf. (Chernivtsi, 09.12.2021). Chernivtsi [in Ukrainian].

Kolodina, A. S., Fedorova T. S. (2022). Digital forensics: problems of theory and practice. *Kyiv Law Journal*. No 1. DOI: 10.32782/klj/2022.1.27 [in Ukrainian].

Komisijos Komunikatas Europos Parlamentui, Tarybai, Europos Ekonomikos ir Socialinių Reikalų Komitetui ir Regionų Komitetui 2030 m. skaitmeninės politikos kelrodis : Europos skaitmeninio dešimtmečio kelias (COM(2021) 118 final). Briuselis, 2021.03.09 / Infolex. URL: https://www.infolex.lt/teise/default.aspx?id=1929&crd=1243617&qi=7005421.

Komisijos Komunikatas Europos Parlamentui, Tarybai, Europos Ekonomikos ir Socialinių reikalų Komitetui ir Regionų Komitetui. Europos požiūrio į dirbtinį intelektą formavimas (COM(2021) 205 final). Briuselis, 2021.04.21 / Infolex. URL: https://www.infolex.lt/teise/default.aspx?id=1929&crd=1245300.

Konovalova, V. O., Shevchuk, V. M. (2022). Modern criminalistics in the conditions of war: problems of adaptation and reload. *Modern research in world science* : Proceedings of the 5th International scientific and practical conference (August 7—9, 2022). Lviv. URL: https://sci-conf.com.ua/wp-content/uploads/2022/08/MODERN-RESEARCH-IN-WORLD-SCIENCE-7-9.08.2022.pdf.

Kosilova, O. I., Rozghon, O. V., Solodovnikova, C. K., Stolbovyi, V. M., Barabash, O. O. (2022). Observance of Human Rights in the Use of AI as Technology. *Law, State and Telecommunications Review*. Vol. 14. No. 2. DOI: 10.26512/lstr.v14i2.41558.

Kovtun, V. O., Rvachov, O. M. (2020). Ohliad ta perspektyvy vykorystannia tekhnolohiy shtuchnoho intelektu v pravookhoronniy diialnosti [Overview and prospects of using artificial intelligence technologies in law enforcement]. *Vykorystannia tekhnolohii shtuchnoho intelektu u protydii zlochynnosti* : mat-ly nauk.-prakt. onlayn-seminaru (Kharkiv, 05.11.2020). Kharkiv [in Ukrainian].

Kozhevnikova, A. (2022). The use of artificial intelligence in the civil process. *Scientific Bulletin of the International Humanities University. Series: Jurisprudence*. № 55. DOI: 10.32841/2307-1745.2022.55.9 [in Ukrainian].

Krytska, I. O. (2020). «Dorizhka tsyfrovykh slidiv»: dokazove znachennia y okremi aspekty zbyrannia ta doslidzhennia u kryminalnomu provadzhenni [Digital footprint trail: evidentiary value and separate aspects of collection and research in criminal proceedings]. *Tsyfrovi transformatsii Ukrainy 2020: vyklyky ta realii* : zb. nauk. pr. NDI PZIR NAPrN Ukrainy № 1 za mat-my kruhl. stolu (Kharkiv, 18.09.2020). Kharkiv. URL: https://ndipzir.org.ua/wp-content/uploads/2020/12/Tezy_18_09_2020_17.pdf [in Ukrainian].

Kryvoruchko, O., Bebeshko, B., Khorolska, K., Desiatko, A., Kotenko, N. (2020). Artificial intelligence face recognition for authentication. *Technical Sciences and Technology*. № 2 (20). URL: http://tst.stu.cn.ua/article/view/215780.

Kryvytskyi, Yu. (2021). Artificial Intelligence as a Tool of Legal Reform: Potential, Trends and Prospects. *Scientific Journal*

of the National Academy of Internal Affairs. 26(2). DOI: 10.33270/01211192.90.

Kurapka, V. Eh., Malevski, G. (2019). Nauchnaia kontseptsiia kriminalisticheskoi politiki v strategiiakh organov pravoporiadka kak innovatsionnyi proryv v obespechenii sozdaniia obshchego evropeiskogo kriminalisticheskogo prostranstva [Scientific concept of forensic policy in the strategies of law enforcement agencies as an innovative breakthrough in the creation of a common European forensic space]. *Innovatsiini metody ta tsyfrovi tekhnolohii v kryminalistytsi, sudovii ekspertyzi ta yurydychnii praktytsi* : mat-ly mizhnar. «kruhl. stolu» (Kharkiv, 12.12.2019). Kharkiv. URL: https://ivpz.kh.ua/wp-content/uploads/2020/01/%D0%97%D0%B1%D1%96%D1%80%D0%BD-%D0%9A%D1%80%D1%83%D0%B3%D0%BB%D0%B8%D0%B9-%D1%81%D1%82%D1%96%D0%BB_%D0%86%D0%BD%D0%BD%D0%BE%D0%B2%D0%B0%D1%86%D1%96%D0%B9%D0%BD%D1%96-%D0%BC%D0%B5%D1%82%D0%BE%D0%B4%D0%B8_2019-%D0%97%D0%B1%D1%96%D1%80%D0%BD%D0%B8%D0%BA.pdf [in Russian].

Latysh, K. (2022). Tsyfrova kryminalistyka u period viyny v Ukraini: mozhlyvosti vykorystannia spetsialnykh znan u sferi informatsiynykh tekhnolohiy [Digital Forensics During the War in Ukraine: Possibilities of Using Special Knowledge in the Field of Information Technologies]. *Kriminalistikairteismo ekspertologija : mokslas, studijos, praktika*. T. 18. URL: https://repository.mruni.eu/bitstream/handle/007/18524/XVIII%20Vilnius%202022_compressed-18-21.pdf?sequence=1&isAllowed=y [in Ukrainian].

Malevski, H., Kurapka, V. E., Tamelė, I. (2021). Motivation and expectations of students — an important factor in the implementation of the new bachelor's degreeprogram "Law and Criminalistics". *The Criminalist of the First Printing*. № 21—22.

Manzhai, O. V., Potylchak A. O. (2020). Crime mapping features. *Law and Safety*. No 79 (4). DOI: 10.32631/pb.2020.4.10 [in Ukrainian].

Michurin, I. O. (2020). Legal Nature of Artificial Intelligence [Legal nature of artificial intelligence]. *Forum Prava*. No 64 (5). DOI: 10.5281/zenodo.4300624 [in Ukrainian].

Mosov, S. P., Khoroshylova, S. Y. (2018). Osoblyvosti zastosuvannia stratehichnoi bezpilotnoi rozviduvalnoi aviatsii u voiennykh konfliktakh XXI stolittia [Peculiarities of the use of strategic unmanned reconnaissance aircraft in military conflicts of the XXI century]. *Zbirnyk naukovykh prats Tsentru voienno-stratehichnykh doslidzhen Natsionalnoho universytetu oborony Ukrainy imeni Ivana Cherniakhovskoho*. № 2 (63). URL: http://nbuv.gov.ua/UJRN/Znpcvsd_2018_2_19 [in Ukrainian].

Movchan, A., Movchan, M. (2020). Use of unlimited aerial vehicles in the activities of law enforcement agencies. *Social & Legal Studios*. No 3 (9). DOI: 10.32518/2617-4162-2020-3-104-110 [in Ukrainian].

Musiienko, O. L. (2019). Vykorystannia tsyfrovykh tekhnolohiy pry rozsliduvanni zlochyniv [The use of digital technologies in the investigation of crimes]. *Innovatsiini metody ta tsyfrovi tekhnolohii v kryminalistytsi, sudovii ekspertyzi ta yurydychnii praktytsi* : mat-ly mizhnar. «kruhl. stolu» (Kharkiv, 12.12.2019). Kharkiv. URL: https://ivpz.kh.ua/wp-content/uploads/2020/01/%D0%97%D0%B1%D1%96%D1%80%D0%BD-%D0%9A%D1%80%D1%83%D0%B3%D0%BB%D0%B8%D0%B9-%D1%81%D1%82%D1%96%D0%BB_%D0%86%D0%BD%D0%BD%D0%BE%D0%B2%D0%B0%D1%86%D1%96%D0%B9%D0%BD%D1%96-%D0%BC%D0%B5%D1%82%D0%BE%D0%B4%D0%B8_2019-%D0%97%D0%B1%D1%

96%D1%80%D0%BD%D0%B8%D0%BA.pdf [in Ukrainian].

Myslyvyi, V. A. (2020). Shtuchnyi intelekt yak faktor zapobihannia dorozhno-transportnoi zlochynnosti [Artificial intelligence as a factor in the prevention of traffic crime]. *Vykorystannia tekhnolohii shtuchnoho intelektu u protydii zlochynnosti* : mat-ly nauk.-prakt. onlain-seminaru (Kharkiv, 05.11.2020). Kharkiv [in Ukrainian].

Petryshyn, O. V., Hyliaka, O. S. (2021). Human rights in the digital age: Challenges, threats and prospects. *Journal of the National Academy of Legal Sciences of Ukraine*. Vol. 28. No. 1. DOI: 10.37635/jnalsu.28(1).2021.15-23.

Pistrakevych, O. V. (2021). Stratehii rozvytku shtuchnoho intelektu v Yevropeiskomu Soiuzi (na prykladi krain Vyshehradskoi hrupy [Strategies for the development of artificial intelligence in the European Union (on the example of the countries of the Visegrad Group)]. *Mizhnarodni vidnosyny, suspilni komunikatsii ta rehionalni studii*. № 1 (9). URL: https://elibrary.kubg.edu.ua/id/eprint/39141/1/O_Pistrakevych_IRPCRS_1%289%29_2021.pdf [in Ukrainian].

Pylypchuk, V. G., Baranov, O. A., Gilyaka, O. S. (2022). The problem of legal regulation in the field of artificial intelligence in the context of the development of the legislation of the European Union. *Journal of the National Academy of Legal Sciences of Ukraine*. T. 29. № 2. DOI: 10.37635/jnalsu.29(2).2022.35-62 [in Ukrainian].

Radutniy, O. E. (2020). Novel Criminal Delicts Related to Digital Human Being. *Herald of the Association of Criminal Law of Ukraine*. T. 1. № 13. URL: http://vakp.nlu.edu.ua/issue/view/12594.

Recommendation of the Council on Artificial Intelligence / OECD Legal Instruments. URL: https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449.

Shepitko, V. (2021). Theoretical and methodological model of criminalistics and its new directions. *Theory and Practice of Forensic Science and Criminalistics*. 25(3). DOI: 10.32353/khrife.3.2021.02.

Shepitko, V. Yu. (2022). Formuvannia doktryny kryminalistyky ta sudovoi ekspertyzy v Ukraini — shliakh do yedynoho yevropeiskoho kryminalistychnoho prostoru [Formation of the doctrine of criminalistics and forensics in Ukraine — the way to a single European forensic space]. *Pravo Ukrainy*. № 2 [in Ukrainian].

Shepitko, V. Yu., Shepitko, M. V. (2021). The role of forensic science and forensic examination in international cooperation in the investigation of crimes. *Journal of the National Academy of Legal Sciences of Ukraine*. Vol. 28. Iss. 1. DOI: 10.37635/jnalsu.28(1).2021.179-186.

Shepitko, V., Shepitko, M. (2021). Doktryna kryminalistyky ta sudovoi ekspertyzy: formuvannia, suchasnyi stan i rozvytok v Ukraini [Doctrine of criminology and forensic examination: formation, current state and development in Ukraine]. *Pravo Ukrainy*. № 8 [in Ukrainian].

Shepitko, V., Shepitko, M. (2021). Formuvannia tsyfrovoi kryminalistyky yak stratehichnyi napriamok rozvytku nauky [The Formation of Digital Criminalistics as a Strategic Direction for the Development of Science]. *Kriminalistika a Forenzne Vedy: Veda, Vzdelavanie, Prax* : 17 Medzinarodny Kongres Zbornik Prispevkov (16—17 sept 2021, Bratislava, Slovenská republika). Bratislava. URL: https://www.akademiapz.sk/sites/default/files/KKFV/2020/CrimCongres2021 zborník draft digit v6 202107.pdf [in Ukrainian].

Shevchuk, V. M. (2020). Perspektyvy zaprovadzhennia tekhnolohii shtuchnoho intelektu u sudovu diialnist v suchasnykh umovakh [Prospects for the introduction of artificial intelligence in judicial activity in modern conditions]. *Vykorystannia tekhnolohii shtuchnoho intelektu u protydii*

zlochynnosti : mat-ly nauk.-prakt. onlayn-seminaru (Kharkiv, 05.11.2020). Kharkiv [in Ukrainian].

Shevchuk, V. M. (2022). Tsyfrova kryminalistyka: formuvannia ta rol u zabezpechenni bezpekovoho seredovyshcha Ukrainy [Digital forensics: formation and role in ensuring the security environment of Ukraine]. *Nova arkhitektura bezpekovoho seredovyshcha Ukrainy* : zb. tez Vseukr. nauk.-prakt. konf. (Kharkiv, 23.12.2022). Kharkiv [in Ukrainian].

Shevchuk, V. M. (2022). Tsyfrova kryminalistyka: voienni vyklyky sohodennia ta novi zavdannia u suchasnykh umovakh [Digital forensics: military challenges of today and new tasks in modern conditions]. *Pravovi vyklyky suchasnosti* : mat-ly Vseukr. kruhloho stolu (Kharkiv, 20.12.2022). Kharkiv [in Ukrainian].

Shevchuk, V. M. (2022). Yevropeiskyi vektor rozvytku suchasnoi kryminalistyky [European vector of modern forensics development]. *Adaptatsiia pravovoi systemy Ukrainy do prava Yevropeiskoho Soiuzu: teoretychni ta praktychni aspekty* : mat-ly Vseukr. nauk.-prakt. konf. z nahody 20-yi richn. stvor. Poltav. yuryd. in-tu NIuU im. Yaroslava Mudroho (Poltava, 29.09.2022). Poltava. URL: http://pli.nlu.edu.ua/wp-content/uploads/2022/12/Zbirnyk-29.09.pdf [in Ukrainian].

Stepaniuk, R., Perlin, S. (2022). Digital forensics and improvement of the forensic technology system in Ukraine. *Bulletin of Luhansk State University of Internal Affairs Named After E. Didorenko*. 3(99). DOI: 10.33766/2524-0323.99.283-284 [in Ukrainian].

Striltsiv, O. M., Fedorenko, O. A. (2022). Problems of legal regulation of the use of artificial intelligence technologies by the National Police of Ukraine. *Scientific Journal of the National Academy of Internal Affairs*. Vol. 27. No. 1. DOI: 10.33270/0122271.30.

Textbook of criminalistics (2016). Vol. 1: General theory / Ed. by H. Malevski, V. Shepitko. Kharkiv.

Tokar, L. V. (2020). Shtuchnyy intelekt na varti spravedlyvosti: utopiia chy perspektyva liudstva [Artificial intelligence as guard of justice: utopia or the prospect of humanity]. *Porivnialno-analitychne pravo*. № 2. URL: https://dspace.uzhnu.edu.ua/jspui/bitstream/lib/35614/1/%d0%a8%d0%a2%d0%a3%d0%a7%d0%9d%d0%98%d0%99%20%d0%86%d0%9d%d0%a2%d0%95%d0%9b%d0%95%d0%9a%d0%a2%20%d0%9d%d0%90%20%d0%92%d0%90%d0%a0%d0%a2%d0%86%20%d0%a1%d0%9f%d0%a0%d0%90%d0%92%d0%95%d0%94%d0%9b%d0%98%d0%92%d0%9e%d0%a1%d0%a2%d0%86.pdf [in Ukrainian].

Tokarieva, K., Savliva, N. (2021). Peculiarities of legal regulation of artificial intelligence in Ukraine. *Scientific Works of National Aviation University. Series: Law Journal «Air and Space Law»*. 3 (60). DOI: 10.18372/2307-9061.60.15967 [in Ukrainian].

Turuta, O., Turuta, O. (2022). Artificial intelligence through the prism of fundamental human rights. *Uzhhorod National University Herald. Series: Law*. No 71. DOI: 10.24144/2307-3322.2022.71.7 [in Ukrainian].

Tymoshenko, Y. P., Kozachenko, O. I., Kyslenko, D. P., Horodetska, M. S., Chubata, M. V., Barhan, S. S. (2022). Latest technologies in criminal investigation (testing of foreign practices in Ukraine). *Amazonia Investiga*. Vol. 11. No. 51. DOI: 10.34069/AI/2022.51.03.14.

Vebb, E. (2020). Velyka deviatka. Yak IT-hihanty ta yikhni rozumni mashyny mozhut zminyty liudstvo [The Big Nine: How the Tech Titans and Their Thinking Machines Could Warm Humanity]/ per. z anhl. I. Vozniaka. Kharkiv [in Ukrainian].

Velykanova, M. M. (2020). Artificial intelligence: legal problems and risks. *Journal of the National Academy of Legal Sciences of Ukraine*. Vol. 27. No. 4. DOI: 10.37635/jnalsu.27(4).2020.185-198.

Von der Leyen, U. A Union that strives for more. My agenda for Europe / European Commission. URL: https://www.europarl.europa.eu/resources/library/media/20190716RES57231/20190716RES57231.pdf.

White Paper on Artificial Intelligence: a European approach to excellence and trust / European Commission. URL: https://commission.europa.eu/publications/white-paper-artificial-intelligence-european-approach-excellence-and-trust_en.

Yurtaieva, K. V. (2020). Vykorystannia tekhnolohii shtuchnoho intelektu v realizatsii stratehii «predictive polic-ing»: mozhlyvosti, problemy ta perspektyvy dlia Ukrainy [The use of artificial intelligence in the implementation of «predictive policing»: opportunities, problems and prospects for Ukraine]. *Vykorystannia tekhnolohii shtuchnoho intelektu u protydii zlochynnosti* : nauk.-prakt. seminar (Kharkiv, 05.11.2020). Kharkiv [in Ukrainian].

Zhuravel, V. A. (2021). Zahalna teoriia kryminalistyky: geneza ta suchasnyi stan [General theory of criminology: genesis and current state]: monohrafiia. Kharkiv [in Ukrainian].

Zhuravel, V. A., Konovalova, V. E., Avdeyeva, G. K. (2021). Reliability Evaluation of a Forensic Expert's Opinion: World Practices and Ukrainian Realities. *Journal of the National Academy of Legal Sciences of Ukraine*. Vol. 28. No. 2. DOI: 10.37635/jnalsu.28(2).2021.252-261.

Zhuravel, V. A., Shepitko, V. Yu. (2021). Rozvytok kryminalistyky ta sudovoi ekspertyzy v Ukraini: nablyzhennia do yedynoho yevropeiskoho prostoru [Development of Criminalistics and Forensics in Ukraine: Approaching a Single European Space]/ *Pravova nauka Ukrainy: suchasnyi stan, vyklyky ta perspektyvy rozvytku* : monohrafiia. Kharkiv [in Ukrainian].

Shevchuk, V. (2022). Artificial Intelligence in Law Enforcement and Justice Bodies: Domestic and European Experience. *Theory and Practice of Forensic Science and Criminalistics.* Issue 4 (29). P. 12—46. DOI: 10.32353/khrife.4.2022.02.