

Artificial Intelligence in the Criminal Justice System: Leading Trends and Possibilities

Tatyana Sushina*

Department of Criminal Procedure Law
Kutafin Moscow State Law University (MSAL)
Sadovaya - Kudrinskaya str. 9, 125993 Moscow
Russian Federation
e-mail: suschin2011@yandex.ru

Andrew Sobenin

Department of Criminal Procedure Law
Kutafin Moscow State Law University (MSAL)
Sadovaya-Kudrinskaya str. 9, 125993 Moscow
Russian Federation
e-mail: andruwik@gmail.com

Abstract This paper focuses on the transformation of criminal proceedings in the framework of the development of digital technologies in the international space, in which a significant place belongs to artificial intelligence. We demonstrate that a variety of digital tools in legal proceedings is used by the United States where legal start-ups specializing in Artificial Intelligence (AI) are capable determine the content of a future court decision with a high degree of probability.

One can see that most of the European Union (EU) Member States already apply advanced technologies in their legal systems and for legal support. Nevertheless, an issue of using the AI in legal proceedings calls for a deeper dialogue on its affinity with the principles of the European Convention on Human Rights (ECHR). With regard to the above, it might be useful to employ the European Ethical Charter on the Use of Artificial Intelligence that provides five basic principles that define the role and place of AI in legal proceedings. This paper focuses on the leading trends and possibilities for using AI in the criminal justice system.

Keywords: *artificial Intelligence, criminal justice system, leadership, digital technologies*

1 Introduction

In the recent years, the science of criminal procedure law has been actively discussing issues of the possibilities of using Artificial Intelligence (AI). The concept of “Artificial Intelligence” (AI) has not been embedded into the legislation but is represented in terms of scientific theories, techniques and methods that have one thing in common – namely, to replicate human cognitive abilities using a computer. A number of Russian authors present artificial intelligence in the form of a device capable of “acting, determining its actions and evaluating their consequences without full control on the part of a human according to the information processing results from the external environment” (Grishin and Naumov 2015). Other authors offer to consider the artificial intelligence as a computer program that imitates a human brain, where the learning mechanism is built in (Morhat 2017). In other words, recognizing the growing importance of artificial intelligence in modern law, the representatives of Russian science and practice unanimously believe that the artificial intelligence is necessary for the machines to replace human in solving complex problems, which will certainly improve the quality of criminal proceeds and make it more transparent, impartial and fair.

Research literature also notes the need for a theoretical understanding of the artificial intelligence phenomenon. In general, the artificial intelligence is understood as a set of theories and techniques used to create machines that can simulate intelligence. It is offered to single out strong, moderate and weak artificial intelligence. The use of strong artificial intelligence will allow autonomously solving complex problems and even simulating the world as a whole. It will be possible to achieve high performance in a specific field of study through moderate artificial intelligence, and weak artificial intelligence will improve the performance of existing information systems due to algorithmic processing (Barr and Feigenbaum 1981; Hutter 2005; or Neapolitan and Jiang 2018).

Some authors define AI as “the system's ability to correctly interpret external data, learn from such data and use this knowledge to achieve specific goals and objectives through flexible adaptation” (Kaplan Haenlein 2020). In other scientific publications, the term AI is used to describe programs that simulate cognitive functions

that people associate with other human minds. First of all, this concerns the training and problem-solving functions (Russell and Norvig 2009).

In computer science, the artificial intelligence is considered as a set of “intelligent agents”, including any device that perceives the environment and takes actions, maximizing its chances to successful achievement of its goals (Nilsson 1998).

The stated approaches of Russian and foreign authors to the analysis of the artificial intelligence concept and the definition of its substantial features, of course, are of great theoretical and practical importance (Apostololova 2019; Biryukov 2019; Alexandrov et al. 2019). However, many issues connected with simplifying and optimising the decision-making procedure in the field of criminal justice by using AI have not yet been tackled (Lupinskaya 2010).

2. Literature review

In the United States of America, the artificial intelligence tools have been used for several decades in decision-making in the criminal justice system. The system of “predictive” (prognostic) justice which is built on full access to all available judicial information and law cases is well-developed there. The predictive justice proved its value, because it reduced legal uncertainty and unpredictability of court decisions.

The artificial intelligence systems have recently appeared in the criminal proceedings of European states. Their development and implementation are due to a number of reasons, primarily, an increase in the burden on criminal justice and a reduction in funds allocated to the administration of justice. European Union law specialists turned to the American lawyers’ experience with using AI in an attempt to minimise the discrimination against a person against whom the criminal procedure decisions and arrived to a conclusion that it has to be influenced by the technological development (Kehl and Kessler 2017). A number of German, French, and British lawyers found that using AI for combating crime might lead to an adverse effect of police activities becoming increasingly out of control. This, in turn, leads to serious violations of the fundamental rights of citizens and impedes their access to justice in some cases (Wilson 2018, Ferguson 2017, Egbert 2018).

In addition, many authors note that the decision-making process carried out through the artificial intelligence systems contains elements of human discrimination on the basis of gender, racial, ethnic, religious, socio-economic features, political and philosophical views, sexual orientation, which violates the equality principle of rights of the parties in the criminal proceedings. Moreover, the use of artificial intelligence systems for commercial purposes may lead to the confidential data disclosure.

3. Research methods

The methodology for studying the possibilities of using artificial intelligence in the criminal proceedings by Russian and foreign lawyers has not been finally formed (Vilkova and Maslennikova 2019). Currently, the artificial intelligence is regarded as a complex phenomenon that is developed at the junction of criminal procedure and information law. The science of criminal procedure law, which should determine the place of artificial intelligence in the system of criminal procedure relations, its substantial aspect and practical significance in the new digital reality, is the main.

Studying the basics of information law will make it possible to comprehend the specific nature of the development of legal relations in the information environment and to understand the information security provision mechanisms.

For the purposes of this study, the capabilities of artificial intelligence were studied using the sociological, regulatory-value, functional, and comparative legal scientific approaches.

4. Results

On the one hand, a study of the experience of using the artificial intelligence in the criminal proceedings of a number of foreign states demonstrates that it provides ample opportunities to ensure transparency, predictability, and standardization of the legal system. On the other hand, AI poses many threats with regard to the limited software possibilities that the IT sector can provide. Taking all of these into account, the government officials and legal bodies involved in the law and criminal proceedings should be aware of the opportunities AI might provide and to watch over its effectiveness and development in the real time.

For example, there are certain risks of calibrating the AI algorithms and using the past family history and criminal behaviour of certain groups of people that might influence its decision-making on fundamentally different groups of people with other social origins, education, skills, perception of guilt and other traits. Human decisions and behaviour are based on different, sometimes uncalculatable factors which are beyond the algorithm’s comprehension. Just to give an example: let us imagine a judge has to decide upon the release a pregnant female

offender who is at risk of relapsing. The AI algorithm would rationally decide against such an individual being released, while the human judge might make a different decision based on the new hierarchy of values that would be created once the offender becomes a mother.

Therefore, we believe that the artificial intelligence cannot be used to resolve all issues arising in the field of criminal proceeding activities.

It seems that the use of artificial intelligence systems to process the statistical data, assist in the preparation of legal documents, browsing the websites for information and making decisions on the criminal act qualification will be the most successful.

In cases then AI is used in the criminal proceedings, it is necessary to ensure compliance with the rule of law, presumption of innocence, and other general principles established by Article 6 of the European Convention for the Protection of Human Rights. The interested party should be able to challenge the scientific validity of the application of artificial intelligence algorithms, the procedural significance attached to its various elements, as well as to justify the fallacy of conclusions made. There is the judge who should decide on the use of the artificial justice system. In addition, such issues as the honour and dignity of a human being, or the protection of the personal data should not be neglected. Therefore, it is worth giving individuals the right not to comply with the decisions made on the basis of automated data processing.

It seems that the judge's role will be significant in the criminal justice system, as before. When deciding, the judge should take into account the totality of objective elements of an individual (education, employment, marital status, health status). For example, in the context of expedited judicial procedures, generalized and averaged data submitted by the penitentiary system bodies can be considered.

In addition, the responsibility of artificial intelligence developers for the harm caused by a particular software product should be studied in detail.

5. Discussion

The algorithmizing trends in the criminal proceedings are of great interest in science and practical jurisprudence (Stanier 2016). For example, it can be seen that at least some crime assessment tools used in the Anglo-American legal systems can be improved with the help of machine learning and artificial intelligence (Egbert 2018; Ferguson 2017; or Wilson 2018).

The tools called “predictive police activities” (before the trial or before the case is brought to court) are being developed quite quickly and are gaining popularity in the European countries. A significant number of algorithms are usually used there to prevent the commission of criminal acts (by identifying possible places where they can happen or people who can commit them).

Big data analytics is increasingly being used in the criminal prosecution of criminals. Some well-known examples include Connect used by the British police for analysing billions of data from the financial transactions to find correlations or patterns in the transactions, or the International Children Sexual Exploitation Database (ICSE DB) managed by the Interpol. The ICSE DB helps identify victims and/or criminals by analysing, for example, furniture and other objects on abusive images or analysing background noise in vide files. Both tools demonstrated their effectiveness in crime combating and prevention. Using the Connect database, a search that previously took several months of investigation can now be completed within minutes with a high level of precision and accuracy.

The law enforcement agencies in different countries are increasingly using crime forecasting software. They include such algorithms as PredPol (Santa Cruz, California, USA), HunchLab (Philadelphia, USA), Precobs (Zurich, Munich), Maprevelation (France) (Kehl and Kessler 2017). Also, the artificial intelligence is used in the work of criminal courts and probation commissions in the USA (Harcourt 2015).

In 2018, the European Commission on the Effectiveness of Justice (CEPEJ) adopted the “Ethical Charter on the Use of Artificial Intelligence in the Judiciary”. When it comes to the criminal proceedings, the most important principles are:

- principle of respecting the fundamental rights: ensuring the compatibility of the AI’s tools and services with the fundamental human rights;
- principle of non-discrimination: prevention of violation of the principle of equality between subjects or groups;
- principle of quality and safety: this concerns the processing of court decisions and data; the certified information sources and data are used with the models in a safe technological environment;
- principle of objectivity and justice: ensuring the availability and comprehensibility of data processing methods, the possibility of conducting external audits;
- principle of user control: excluding a prescriptive approach and ensuring that the users are informed and control their choices.

The experience of Kazakhstan, where a project to introduce the artificial intelligence to predict court decisions, has been implemented since 2019, will also be useful. The artificial intelligence system includes 1.2 million judicial acts and 120 thousand statements of claim now. It is assumed that if it is difficult to make a decision, the judge will turn to this system for help: after certain criteria are specified, the artificial intelligence will form the top 10 court cases similar to that one considered by the judge, upon request. However, the question arises of how the court case outcome forecasting service will affect the judges in making their decisions, given the fact that Kazakhstan has no case law (forbes.kz 2020).

It is worth noting that there is a fundamental difference in approaches to the implementation of the right to protect confidential data and intellectual property results between the countries of the EU and the USA. American lawyers are still reluctant to fully acknowledge this right and believe that private interests, such as intellectual property protection, are higher than the right to defence. The European countries, by contrast, use the right to information on logic underlying the decisions made using the algorithms (GDPR).

The US experience in developing the Harm Assessment Risk Tool (HART), which is currently being tested in the UK, is also very interesting. This machine learning-based technology was developed using the Durham Police Archives 2008-2012. The AI can assess the risk (from low to high) of repeated crimes that may be committed by suspects based on approximately thirty factors by examining the decisions made by the police during the past period. Some of the factors are not even related to the criminal behaviour (e.g. zip code and gender).

In the tests held in 2013, HART proved to be 98% efficient at predicting a low risk and 88% effective at predicting the risk of relapse. So far, the HART has an exclusively advisory role for the judge, and the police regularly check the HART functioning systems and evaluate the validity of its findings. For example, in the United States of America, the non-governmental organization ProPublica identified the discriminatory value of the method used in the COMPAS (Correctional Officer Management Profiling for Alternative Sanctions) software which was created for evaluating the risk of relapsing under specific circumstances. This algorithm was created by a private company and is applied by the judges in several U.S. states. It includes 137 questions to which either the accused answers or the answers are formed according to the information from the criminal case. The questions are diverse and relate to various areas (presence of a home phone, problems with debt on family history, crimes committed earlier, etc.). The algorithm estimates a person on a scale of 1 (lower risk) to 10 (great risk). This scale serves as a kind of auxiliary tool for making judicial decisions, since its conclusions are only one of the circumstances considered by a judge in sentencing.

The system assigns a high level of risk of relapse to the African American representatives twice as often as others within two years after the sentencing, even though the developers did not put such an algorithm into the system. Moreover, the system concluded during its work that other citizens were much less prone to commit a repeated offense. However, this misleading interpretation only shows the social and economic delicacy of certain groups of the population that are not criminogenic in nature. The researchers from Dartmouth College detected that this type of algorithm does not have the additional efficiency, since people without a criminal registration can get the same thing rate by answering the questions.

Another reason for concern was the lack of transmittance in the operating procedures of algorithms developed by individual companies for which the intellectual property rights were registered. Since the data comes from the national authorities, the personal rights protection might become a serious issue here. Sometimes the general public is informed about operations with big data inconsistently, with leaks or mistakes. There was a cause when ProPublica identified flaws in the COMPAS algorithm after the owner company refused to share the data. The non-governmental organization had to turn to special state bodies in order to gain access to the data and hire its own specialist to study the algorithm.

The outcome of discussions (Završnik 2019) on the prospects for using the artificial intelligence in the criminal proceedings may lead to the conclusion that the artificial intelligence should become a tool that serves to achieve the purpose of criminal proceedings, subject to respect for the fundamental rights and freedoms of an individual, absence of discrimination and creation of an effective personal data protection mechanism.

6. Conclusions

All in all, in this paper we finalized the methodology for researching the possibilities of using artificial intelligence in criminal proceedings by Russian and foreign lawyers. Currently, artificial intelligence is regarded as a complex phenomenon that develops at the junction of criminal procedure and information law. The main one is the science of criminal procedure law, which should determine the place of artificial intelligence in the system of criminal procedure relations, its substantial aspect and practical significance. Studying the basics of information law will make it possible to comprehend the specifics of the development of legal relations in the information environment and to understand the mechanisms for ensuring information security.

In relation to the Russian criminal proceedings, artificial intelligence can be used to process statistical data, assist in the preparation of documents, saturate the sites of law enforcement agencies and courts with legal

information, and make decisions on the qualification of a criminal act. Therefore, it is crucial to observe the rule of law, the presumption of innocence, as well as other general principles of criminal proceedings.

Acknowledgments

This publication was prepared within the scope of the RFBR-supported research project No. 18-29-16018 “The concept of criminal procedure building ensuring access to justice in the development of digital technologies”.

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