

PROPOSAL FOR INTRODUCING THE INSTITUTION OF FORENSIC ARTIFICIAL INTELLIGENCE

Aleksandar Ivanović

Doctor of Science, regular university professor, adviser,
Police Administration of Montenegro, e-mail: ialeksandar@t-com-me

Natalia Filipenko

Doctor of Law, Professor, Professor at the Law Department of National Aerospace
University – “Kharkiv Aviation Institute” NAU “KhAI”, Kharkiv, Ukraine,
e-mail: n.filipenko@khai.edu

This article deals with the application of artificial intelligence in forensic science. The article presents a proposal for the application of artificial intelligence in judicial proceedings, and it refers to the introduction of a new institution. Refers to Forensic Artificial Intelligence (FAI)! FAI would represent a software system, which would consist of software and hardware and would have the possibility to be engaged as a court expert-forensic expert at the main hearings in court! The paper will present arguments on what advantages would be the formation of the FAI, and also what disadvantages could arise from the application of this, in the author's opinion, advanced idea for a just and fair presentation of forensic evidence in court!

Keywords: artificial intelligence, forensic sciences, expert reports.

ПРОПОЗИЦІЯ ЩОДО ВПРОВАДЖЕННЯ ІНСТИТУТУ ШТУЧНОГО ІНТЕЛЕКТУ НА ДОПОМОГУ КРИМІНАЛІСТИЦІ

Александр Ивановіч, Наталія Філіпенко

Розглянуто застосування штучного інтелекту в криміналістиці. Запропоновано запровадити новий інститут — штучний інтелект на допомогу криміналістиці — програмний комплекс, який міститиме програмне й апаратне забезпечення та матиме змогу долучатися як судовий експерт-криміналіст на слуханнях у суді. Аргументовано переваги штучного інтелекту на службі у криміналістики, а також окреслено недоліки застосування цієї, на думку автора, прогресивної ідеї для справедливого й неупередженого представлення судових доказів у суді!

Ключові слова: штучний інтелект; судові науки; експертні висновки.

INTRODUCTION

The role and importance of forensics and forensic sciences in society is generally known. Every modern society strives to be based on justice, security and freedom. Each of the mentioned contemporary segments of social value is based on an independent and modern judiciary. Modern justice implies the application of modern and sophisticated forensic techniques and technologies. All three mentioned segments of modern, democratic society depend

on the quality of the application of forensic sciences in the judiciary. There is no justice, security, and especially the freedom of citizens, if society does not provide them with a judicial system where evidence and facts are based on repeatable, verifiable and internationally agreed forensic analyses, examinations and expertise. Expert examination and comparison of fingerprints, handwriting, traces of firearms (shells, projectiles...), traces of shoes, traces of glass, photos and videos from the crime scene

and various forensic traces, requires a long-term, often exhausting and demanding engagement of a court expert. So the question is sometimes (un)justifiably asked whether such long-term, exhausting work can lead to errors due to fatigue and/or other circumstances? Especially with the application of subjective forensic methods, can it be suspected that the forensic scientist was tired, biased, emotional and/or under any prejudices during the forensic analysis, examination and expert examination? The elimination of this type of (un)justified doubts about the application of forensic sciences in the judiciary in certain, and especially subjective methods, would be solved by the application of artificial intelligence! When defining the term artificial intelligence, the European Union was the first to react, so the experts of the European Commission defined it as: "Artificial intelligence systems are software (and possibly hardware) systems developed by humans, and have a complex goal of acting in the physical or digital dimension, collecting environmental data, interpretation of collected and systematized or unsystematized data in the form of conclusions based on previously acquired knowledge, i.e. the results of processing new information and the ability to make decisions about the best ways. Such artificial intelligence systems can follow the rules set by the programmer, construct a digital model of a certain process or occurrences, and they can also change their own behavior, adapting it to the environment. conditions that have changed as a result of previously perfect actions.

Artificial intelligence in forensic science can be applied to process and analyze large amounts of data, and the emphasis is on data interpretation. Artificial intelligence helps to overcome the shortcomings of forensic investigation and human error, but primarily in improving, speeding up and facilitating the investigation (Ahmed Alaa El-Din, 2022; Budić, 2022; Budić, 2023; Gupta, Sharma and Johri, 2020; Jadhav, Sankhla and Kumar, 2020).

Forensic sciences require the analysis of large amounts of complex data, while artificial intelligence offers problem solving in real time

and space, saving the time of forensic experts and at the same time court proceedings in individual cases. Although artificial intelligence in forensic sciences would be used in all forensic disciplines, its application would be the most and mainly represented during the reconstruction of the crime scene, the use of 3D scanners, and then also in the analysis of DNA evidence, the analysis of fingerprints (dactyloscopy).), forensic odontology, forensic ballistics and firearms trace detection, toxicology and narcotics analysis (Ahmed Alaa El-Din, 2022, pp. 24-26).

The basis of the application of artificial intelligence in forensic sciences is digital forensics, which is based on complex analysis of databases. How complex is the application of digital techniques and technologies analyzing forensic data, we can see on the example of the DNA database of Great Britain, which contains over 4.5 million samples, both convicted and innocent persons who are suspected.

Forensic of Artificial Intelligence (FAI)

The authors of this paper propose a new thing in judicial procedure, namely the formation of an institution - Forensic Artificial Intelligence (FAI)! Forensic Artificial Intelligence (FAI) would be a software system consisting of hardware and software. He would be available to the participants in the court proceedings (judges, prosecutors, lawyers) and could be "engaged" in court hearings like all court experts hired by the court, who were chosen from the state register of court experts. The FAI hardware would be the carrier of artificial intelligence, that is, the electronic and mechanical parts that make up the system. The software would contain the programs used to manage the system. FAI would collect all data from a specific forensic discipline that is available on all kinds of scientific and professional networks. In this way, through the FAI, all data, which can be useful and which any party in the court proceedings would request, would be available to all participants in the court proceedings and would be available in real time and space. Also, FAI could conduct a meta-analysis of data extracted from all scientific and professional databases (monographs,

textbooks, magazines, studies...), and transform the aforementioned metadata into an understandable and simplified format in the form of useful information (which is sought by judges, prosecutors, lawyers) in a very short time. Collecting and storing a large amount of information and data for forensic experts is a very difficult, extensive process that requires a long time. But FAI solves that problem with the large capacity of its database, which it uses to collect and store forensic data, its properties, research and results. By collecting and analyzing a large amount of data, the FAI would be of great use when confirming or refuting certain evidence in court, and thus also when investigating various types of criminal offenses.

Arguments for and against the institution — Forensic Artificial Intelligence (FAI)

In addition to the argumentation for the formation and application of the Forensic Artificial Intelligence institution, which would greatly contribute to the accuracy and efficiency of court proceedings, and refers to the presentation of forensic expertise, analysis and examination, artificial intelligence algorithms are implied. The mentioned algorithms are able to process huge amounts of forensic data in a very short period of time. Such a short time period for the analytical processing of a large amount of forensic data, such as fingerprints, DNA profiles, marks on the casings of firearms and others, is unattainable by human forensic scientists. In addition to the speed in the work of the application of AI, which enables the efficient and effective action of the police, prosecutors and judges in criminal proceedings in which a large amount of forensic data needs to be processed in a short time, the application of AI in cases of forensic identifications is exempt from any type of error, which can possibly be report in the case when a human-forensic expert examines (compares) a large number of forensic data (for example, fingerprints). The application of FAI in elucidating and solving certain criminal acts, by automating routine tasks (such as the analysis of fingerprints, DNA profiles, digital forensics, etc.) will greatly help

forensic scientists and criminologists to completely and exclusively direct and focus their work and engagement on interpretive aspects of the investigation, that is, based on their experience and logic, summarize the work of the FAI and draw conclusions based on which the criminal offense in question will be resolved effectively and efficiently.

In opposing arguments, one should think about ethical and privacy issues, dependence on technology, for example, although artificial intelligence can improve forensic capabilities, it is not infallible. On the basis of the above-mentioned statement, an (un)justified question arises: who is responsible in the event of a mistake when engaging the FAI? Is it the FAI itself and how and in what way can this institution be exposed to responsibility and/or is the responsibility of the experts who created the FAI, created the algorithms and entered the forensic data? Furthermore, by applying FAI in court proceedings, there is also the risk of technological malfunctions, as well as potential cyberattacks on forensic databases. Mentioned are critical shortcomings that should be addressed in future articles and research.

CONCLUSION

The application of artificial intelligence in forensic sciences is not a matter of choice but an inevitability, but its application carries numerous challenges and the process should be approached seriously. The generally accepted view would be that the introduction of artificial intelligence into forensic science precludes any bias, prejudice, errors caused by fatigue, loss of forensics concentration and the like. The availability of a large amount of data and information, which can be used during forensic analysis, examination and expertise, further saving of time during forensic research, accuracy, precision, competence, are all arguments that indicate that the application of artificial intelligence would greatly modernize and improve work and engagement court experts, and therefore the judiciary as a whole! But, apart from the aforementioned optimism, there is also (un)warranted caution?

This mainly and mainly refers to what rights and obligations the digital system called in this article - Forensic Artificial Intelligence (FAI) would have. In addition to the obligation that FAI must respect human rights in order to protect personal data (DNA profiles, fingerprints and other forensic data, which are treated by the law on the protection of personal data of citizens), FAI should also have ethical responsibility. The most important aspect of FAI's work is ethics, followed by security, transparency, impartiality, privacy protection. In the application of forensic sciences in the judiciary, but also in society in general, the development of FAI should not be primary in relation to ethics, on the contrary, but at the beginning it should be defined whose, what and how much ethical responsibility. in the work of the FAI, and then to the responsibility for any errors in the work of the FAI? However, apart from the stated obligations, it is necessary to define what rights the FAI would have? Like any forensic professional, the FAI should have the right to protect its integrity. In this way, by applying artificial intelligence in the judiciary, the FAI would be recognized as having consciousness and conscience in addition to forensic data!

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