ЖИНОЯТЛАРНИ ФОШ ЭТИШ ВА УЛАРНИ ТЕРГОВ ҚИЛИШ ЖАРАЁНИДА СУНЪИЙ ИНТЕЛЛЕКТ АФЗАЛЛИКЛАРИ

Халилов Шоҳруҳ Мирзо Боймурод ўғли

Ўзбекистон Республикаси Ҳуқуқни муҳофаза қилиш академияси ўқитувчиси

E-mail: ***shokhrukh.khalilov@list.ru***

https://doi.org/10.5281/zenodo.14613457

Аннотация. *Мазкур мақола жиноят-процессуал ҳуқуқи ҳамда тезкор-қидирув фаолияти, шунингдек криминалистика соҳасининг муҳим ва долзарб институтларидан бири ҳисобланган жиноятларни фош этиш ва улар бўйича терговга қадар текширув, суриштирув ҳамда дастлабки тергов ҳаракатларини олиб боришда сунъий интеллектнинг тутган ўрни, улардан фойдаланиш истиқболлари, шу билан бирга жиноятларни тергов қилишда сунъий интеллект ютуқлари ва инсон интеллекти даражаларини ўзаро қиёслаш масалаларини ёритишга бағишланган.*

Мақолада сунъий интеллектни қўллаш асослари, тартиби, қўллаш соҳалари, ҳамда мазкур воситаларни қўллашга доир фикр-мулоҳазалар, бу борадаги қонун ҳужжатларини такомиллаштиришга оид бўлган таклиф ва тавсиялар берилган.

Мақолада айрим тергов ҳаракатларини ўтказишда сунъий интеллектдан фойдаланишнинг имкониятлари ва афзалликлари ҳақида фикр билдирилади. Хусусан, сўроқ жараёнида сунъий интеллект ёрдамида овозни таниш, сўзлардаги эмоционал ўзгаришларни аниқлаш ва юз ифодаларини таҳлил қилиш масалалари берилган. Сўроқ жараёнида гувоҳ ёки жабрланувчининг психологияси ва айтилаётган маълумотнинг ишончлилик даражасини баҳолашга ёрдам беради. Шу билан бирга, сўроқ жараёнида аудио ва видео ёзувни автоматик равишда қайд этадиган сунъий интеллект тизимларини жорий қилиш, бу ёзувларни кейинги таҳлил учун сақлаб қолиш ва автоматлаштирилган таҳлил қилиш тизимини ишлаб чиқиш лозимлиги ҳақида таклифлар берилади.

Таянч сўзлар: *тезкор-вакил, суриштирувчи, терговчи, тергов, сунъий интеллект, тезкор-қидирув фаолияти, терговга қадар текширув, суриштирув, дастлабки тергов, процессуал ҳаракат, электрон ҳужжат, тезкор таҳлил.*

THE ADVANTAGES OF ARTIFICIAL INTELLIGENCE IN THE PROCESS OF REVEALING AND INVESTIGATING CRIMES

Abstract. *This article is devoted to the disclosure of crimes, which are one of the important and relevant institutions of criminal procedural law and operational-search activities, as well as criminalistics, and the role of artificial intelligence in conducting pre-trial investigation, inquiry and preliminary investigation on them, the prospects of their use, as well as the issues of*

comparing the achievements of artificial intelligence and the levels of human intelligence in the investigation of crimes.

The article presents the foundations, procedure, areas of application of artificial intelligence, as well as opinions on the application of these tools, proposals and recommendations for improving the legislation in this area.

The article discusses the possibilities and advantages of using artificial intelligence in conducting separate investigative actions. In particular, in the process of the survey, questions were given about voice recognition using artificial intelligence, identifying emotional changes in words and analyzing facial expressions. During the interrogation process, it helps to assess the psychology of the witness or victim and the level of reliability of the information provided. At the same time, it is proposed to introduce artificial intelligence systems that automatically record audio and video recordings during the survey, save these records for further analysis and develop an automated analysis system.

Keywords: *operational officer, investigator, investigator, investigation, artificial intelligence, operational-search activity, pre-investigation check, inquiry, preliminary investigation, procedural action, electronic document, operational analysis.*

ПРЕИМУЩЕСТВА ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ПРОЦЕССЕ РАСКРЫТИЯ И РАССЛЕДОВАНИЯ ПРЕСТУПЛЕНИЙ

Аннотация. *Данная статья посвящена раскрытию преступлений, являющихся одним из важных и актуальных институтов уголовно-процессуального права и оперативно-розыскной деятельности, а также криминалистики, и роли искусственного интеллекта в проведении доследственной проверки, дознания и предварительного следствия по ним, перспективам их использования, а также вопросам сравнения достижений искусственного интеллекта и уровней человеческого интеллекта при расследовании преступлений.*

В статье представлены основы, порядок, области применения искусственного интеллекта, а также мнения по применению этих средств, предложения и рекомендации по совершенствованию законодательства в этой области.

В статье говорится о возможностях и преимуществах использования искусственного интеллекта при проведении отдельных следственных действий. В частности, в процессе опроса даны вопросы распознавания голоса с помощью искусственного интеллекта, выявления эмоциональных изменений в словах и анализа выражений лица. В процессе допроса помогает оценить психологию свидетеля или потерпевшего и уровень достоверности сообщаемой информации. При этом предлагается внедрить системы искусственного интеллекта, которые автоматически фиксируют

аудио-и видеозаписи в процессе опроса, сохранить эти записи для дальнейшего анализа и разработать систему автоматизированного анализа.

Ключевые слова: *оперативный сотрудник, дознаватель, следователь, следствие, искусственный интеллект, оперативно-розыскная деятельность, доследственная проверка, дознание, предварительное следствие, процессуальное действие, электронный документ, оперативный анализ.*

Introduction

1.1. Relevance of the Topic

In our Republic, special attention is being paid to combating crime, preventing offenses, solving crimes, and ensuring the implementation of the principle of the inevitability of punishment for every crime. This is because ensuring the peace and security of our country, as well as the tranquility of its citizens, is a matter of critical importance. To this end, several normative-legal acts have been developed in our country, such as, the Decree of the President of the Republic of Uzbekistan No. PD-4996 dated February 17, 2021, “On Measures to Create Conditions for the Accelerated Introduction of Artificial Intelligence Technologies”, the Decree of the President of the Republic of Uzbekistan No. PD-5234 dated August 26, 2021, “On Measures to Introduce a Special Regime for the Use of Artificial Intelligence Technologies”, the Decree of the President of the Republic of Uzbekistan No. PD-229 dated June 21, 2024, “On Measures to Organize Scientific Research Activities in the Field of Digital Forensics” and the Decree of the President of the Republic of Uzbekistan No. PD-358 dated October 14, 2024, “On Approval of the Strategy for the Development of Artificial Intelligence Technologies until 2030.”

1.2. Justification of the article’s specific purpose and issues to be addressed

The purpose of this scientific article is to explain the necessity of applying artificial intelligence (AI) in pre-investigation checks, inquiries, and preliminary investigation activities, to reveal the specifics of using AI in conducting certain investigative actions, and to expand the integration of digital technologies and automation systems into the investigative process.

This approach aims to organize work processes more efficiently and transparently, optimize procedural actions and mechanisms, and reduce errors in the investigative process. The article provides an opportunity to study the problems in the field, propose recommendations for their resolution, and prepare scientifically grounded conclusions.

The necessity of applying artificial intelligence (AI) in pre-investigation checks, inquiries, and preliminary investigative activities can be observed in the following aspects:

- ensuring the principles of independence, efficiency, transparency, and impartiality in the activities of authorized officials of law enforcement agencies during pre-investigation checks, inquiries, and preliminary investigations;
- simplifying the processes of conducting pre-investigation checks, inquiries, and preliminary investigative activities;
- providing prompt and justified solutions to citizens' applications;
- timely elimination of issues in the field;
- conducting procedural actions with speed and accuracy, analyzing large datasets, and automating repetitive processes;
- predicting crimes and preventing their occurrence;
- enhancing interagency collaboration and coordination among various institutions;
- utilizing AI to recognize voices, detect emotional changes in speech, and analyze facial expressions during interrogations;
- integrating AI programs capable of identifying individuals through video or image recognition;
- detecting crimes committed with the help of digital technologies and developing proposals to address existing challenges in investigative practices.

What is Artificial Intelligence?

Artificial Intelligence (AI) is a field of science and a collection of technologies aimed at creating systems capable of simulating human intellectual abilities. These systems reflect the capabilities inherent in the human brain in the processes of data processing, decision-making, and problem-solving. AI refers to the ability of computer systems to perform processes similar to human intellectual activity. These processes include:

1. **Data processing** – the ability to collect, organize, and derive meaning from information.
2. **Decision-making** – finding effective solutions based on data.
3. **Problem-solving** – performing complex tasks typical of humans using algorithms.
4. **Self-learning** – developing knowledge and skills based on new information.

Advantages and Limitations of Artificial Intelligence:

While artificial intelligence (AI) expands the possibilities of human intellect, it also has inherent limitations and challenges.

- **AI** enables fast and accurate analysis, effective processing of large datasets, automation of repetitive processes, and reduced error rates compared to human performance. It is widely applied in fields such as healthcare, industry, education, and crime monitoring.

Despite its advantages, AI is not equivalent to human cognitive abilities, particularly in understanding and reasoning. It struggles with ethical or social decision-making in the same way

humans do. Additionally, AI algorithms may sometimes yield inconsistent results due to the complexity and diversity of the data. The misuse of AI technologies also raises concerns, especially regarding privacy and security, which remain subjects of significant debate.

The integration of AI into criminal investigations provides several key benefits. Firstly, AI strengthens the procedural and forensic aspects of investigations. Secondly, AI simplifies the work of investigators by automating repetitive and complex tasks. Thirdly, the use of AI opens the door for introducing modern and necessary amendments, additions, and updates to criminal procedural laws, including those related to the rights and obligations of participants in criminal proceedings, such as individuals and their legal representatives. By incorporating AI tools, the criminal investigation process can become more dynamic, transparent, and adaptable to the demands of contemporary legal practices.

1.3. How other authors have approached the issue raised in the article, what methods they have applied, etc. (literature review).

The application of artificial intelligence (AI) in the processes of preliminary investigation and inquiry, including its benefits, effective directions and methods, achievements, as well as potential errors, has been explored in various national and international educational and scientific works (textbooks, study guides, dissertation research, monographs, etc.). Diverse opinions and relevant ideas have been put forward in this regard. Notably, several proceduralist scholars (Y. Polatov, G. Tulaganova, D. Suyunova, U. Tukhtasheva, S. Rakhmonova, D. Bozorova, D. Mirazov, Sh. Qulmatov, I. Astanov, and others) have paid particular attention in their research to issues related to investigative activities, the authority of investigators, or the subject matter, either in general or from specific perspectives.

In the article titled "Issues of Ensuring the Procedural Independence of an Investigator in Criminal Proceedings" by B. Elmurzaev and K. Mavlonov[1], the legal status of the investigator as a participant in criminal proceedings, who plays a significant role in the conduct of criminal cases, is analyzed. The article examines the investigator's position, rights, and responsibilities in conducting preliminary investigations in criminal cases. Additionally, the authors explore the investigator's powers as an official responsible for the burden of proof, as well as the influence of departmental, prosecutorial, and judicial oversight on the investigator's exercise of those powers.

Artificial Intelligence (AI) is being actively introduced into the field of crime detection and the initial stages of investigation, offering significant advantages in these areas. Some

[1] Мавлонов К. Повышение прозрачности в судебно-следственной деятельности. Общество и инновации. 3, 8/S (сен. 2022), 279–284. DOI:https://doi.org/10.47689/2181-1415-vol3-iss8/S-pp279-284.; Билолиддин Элмурзаев, Камолиддин Мавлонов, Вопросы обеспечения процессуальной независимости следователя в уголовном процессе , Общество и инновации: Том 3 № 1 (2022): Междисциплинарный электронный научный журнал «Общество и инновации»

proceduralist scholars (both domestic and foreign) emphasize the following key aspects of using AI in these processes:

1. Automation and acceleration of data analysis (rapid analysis):

AI has the capability to process large volumes of data within a short period, enabling the rapid identification of patterns and connections between various pieces of information. This significantly accelerates the investigation process and enhances its efficiency. As noted by O.N. Paliyeva and I.A. Sementsova[2], the use of information technologies and AI in criminal investigations aids in the faster and higher-quality consolidation of evidence.

2. Enhancing the accuracy and reliability of evidence:

AI can be used to analyze and interpret evidence, reducing the likelihood of human error and increasing the reliability of the obtained information. As highlighted by A.V. Tarasov and A.R. Temzoko[3], AI helps improve the quality of law enforcement work by automating routine operations and analyzing data.

3. Predicting and preventing crimes:

AI systems are capable of analyzing historical data and predicting potential crimes, allowing law enforcement agencies to take preventive measures. Valery Vasilyevich Biryukov emphasizes[4] that AI can be used to forecast crimes and their locations, enabling proactive measures to prevent crime and enhance public safety.

4. Improving Collaboration Between Agencies:

AI facilitates integration and information exchange among various law enforcement agencies, improving coordination and the effectiveness of joint actions.

The introduction of AI into forensic medical examination opens new opportunities for investigating crimes and ensuring public safety.

5. Legal Aspects and Procedural Consequences:

When using artificial intelligence (AI), it is crucial to address issues such as data confidentiality, algorithmic bias, and accountability for decisions made based on AI. Lydia Alexandrovna Grebenkova and Ekaterina Romanovna Zakharova[5] emphasize the necessity of

[2] Палиева О.Н., И.А. Семенцова. Использование искусственного интеллекта и информационных технологий в ходе расследования уголовных дел. //Актуальные аспекты уголовного права, уголовного процесса и криминалистики. Вестник Московского университета имени С.Ю. Витте. Серия 2. Юридические науки. 2021. № 2 (28) 35-39;

[3] ЮРИСПРУДЕНЦИЯ В ТЕОРИИ И НА ПРАКТИКЕ: АКТУАЛЬНЫЕ ВОПРОСЫ И СОВРЕМЕННЫЕ АСПЕКТЫ: Сборник статей XVIII Международной научнопрактической конференции. – Пенза: МЦНС «Наука и Просвещение». – 2024. – 198 с.

[4] Бирюков В.В. Искусственный интеллект: потенциал, проблемы и перспективы использования в расследовании преступлений. //V. V. BIRYUKOV. BULLETIN OF THE LAW FACULTY, SFEDU. 2024. Vol. 11, No. 2. P. 94–102.

[5] Гребенькова Л.А., Захарова Е.Р. Проблемы уголовно-правового регулирования искусственного интеллекта и пути их решения //Вестник МГПУ «Юридические науки», 2023, №4 (52), 108. https://doi.org/10.25688/2076-9113.2023.52.4.1.

developing legal mechanisms to regulate the use of AI in criminal law to ensure the protection of citizens' rights and freedoms.

Thus, while the use of AI in solving crimes and during the initial stages of investigation offers significant advantages, it also requires careful consideration of ethical and legal issues.

For instance, O.N. Palieva and I.A. Sementsova, in their research, describe AI as a program embedded in specific computer systems that adapts to environmental conditions and mimics human intellectual activity. They highlight the constant need for investigators to utilize AI and the latest information technologies more quickly and effectively to expedite the detection of crimes and improve the quality of investigations. The application of information technologies aids in effectively consolidating evidence in criminal cases and enables participants in the criminal process to exercise their legal rights and interests.

2. Materials and Methods

2.2. Justification of the Methods, Methodology, and Research Objects

Research Methods: In the process of studying the topic, scientific methods such as logical-legal analysis, formal analysis, comparative-legal analysis, systematic analysis, statistical methods, as well as sociological surveys and interviews are used. For example, as a result of logical analysis, questions such as "To what extent does the use of artificial intelligence tools facilitate the activities of investigators?", "Which investigative actions become more active due to artificial intelligence?", and "To what extent does the use of artificial intelligence simplify the activities of investigators?" are posed, and their solutions are provided.

1. Rapid and efficient processing of large volumes of data:

One of the main challenges in the criminal investigation process is the large volume of information. Through artificial intelligence (AI):

- **Collecting and analyzing data from multiple sources:** Data from various sources, such as camera footage, social media, news, and documents, is automatically collected and analyzed by AI. In one study, it was reported that AI was able to analyze 12 hours of video footage in just 1 hour[6]
- **Forming criminal scenarios:** By identifying connections between data, AI helps model the likelihood and scenarios of a crime occurring.[7]

2. Documentation and Data Organization Capabilities

[6] *Lee, K., et al. (2021). AI Applications in Surveillance and Crime Analysis. Surveillance Studies, 29(4), 485–503.*
[7] *Brown, J., & Taylor, S. (2020). The Power of AI in Processing Big Data for Crime Analysis. Law & Technology Journal, 28(1), 113-130.*

Artificial intelligence (AI) has the ability to automate and organize data, presenting information to investigators in a convenient manner:

- **Centralizing Data into a System:** During the investigation process, various information, including data on suspects and witnesses, is placed into a single database. This increases the efficiency of analyzing a crime by identifying and organizing the relationships between the data[8]
- **Improving User Interfaces:** With AI, adaptable interfaces are created for investigators, helping them to easily view, analyze, and make decisions based on the information. These interfaces enable the visualization of data and automate the analysis process.[9]

3. Identifying and Analyzing Crime Patterns:

Through artificial intelligence (AI), various patterns and models can be identified from the data collected at crime scenes:

- **Identifying Similarities Between Crimes**: Technical and mathematical learning algorithms help identify patterns based on the methods of crime commission, time, and location factors. These methods allow for understanding the behaviors of individuals who commit serial crimes[10]
- **Identifying Individuals Who Commit Serial Crimes**: By monitoring their typical movements, it becomes possible to predict the future actions of subjects, which helps in quickly identifying those who have committed crimes.[11]

4. Facial and Voice Recognition:

Artificial intelligence (AI) simplifies the process of facial and voice recognition by analyzing video and audio recordings:

- **Computer Vision Technologies**: AI recognizes the faces of individuals from camera footage and compares them with data stored in a database. The technologies used in this process enhance the efficiency of analyzing video recordings.[12]
- **Voice Analysis**: Voice-to-text algorithms are used to analyze various recordings. For example, phone recordings related to a crime (such as murder) or witness audio recordings are automatically analyzed.[13]

5. Saving Time and Resources in the Investigation Process:

[8] *Garcia, M., et al. (2022). Centralized Information Systems in Crime Investigation: AI Applications. Journal of Criminology and Informatics, 49(3), 289-305.*
[9] *Patel, S., & Nguyen, T. (2021). User-Friendly Interfaces for AI-Based Criminal Investigation. Policing Technology Journal, 17(2), 96-111.*
[10] *Roberts, P., et al. (2020). AI-Driven Crime Pattern Analysis and Serial Offender Identification. Forensic Science Journal, 35(4), 402-420.*
[11] *Harris, L. (2023). Using Machine Learning to Predict Criminal Behavior Patterns. Crime and Law Journal, 62(5), 193-211.*
[12] *Zhao, Y., & Choi, D. (2022). Facial Recognition in Criminal Investigations. Journal of Digital Forensics, 54(3), 275-287.*
[13] *Blake, R., et al. (2021). Audio Analysis and AI in Law Enforcement. Law and Forensics Journal, 47(4), 193–205.*

Using artificial intelligence (AI) significantly reduces the time and costs spent during the initial stages of an investigation:

- **Data Sorting and Filtering**: With AI, automatic filtering algorithms present only relevant and crucial information to investigators. This process greatly reduces the time spent by humans.[14]
- **Cost Reduction**: AI, through automated processes, reduces the need for human resources, helping law enforcement agencies to significantly cut down on costs.[15]

3. Research Results

3.1. Analysis of the Dynamics of Key Indicators Describing the Research Object (within the scope of the data relevant to solving the issues presented in the article) and Conclusions

Which areas of the pre-trial investigation process (investigative procedures) can artificial intelligence (AI) be applied to?

The following provides detailed information on the capabilities of artificial intelligence (AI) for each investigative action and the procedure for its implementation:

1. Interrogation (Witnesses, Victims, Suspects, and Accused Individuals)

During the interrogation process, AI can be used for voice recognition, detecting emotional changes in speech, and analyzing facial expressions. AI assists in evaluating the psychology of the witness or victim and assessing the reliability of the information being provided.

2. Identification Procedures

AI enables the automatic recognition of a suspect (perpetrator) through photofits or various facial appearances and processes video surveillance materials. This application allows for the rapid identification of the person who committed the crime.

3. Inspection and Verification of Statements at the Crime Scene

AI can be used to automatically recognize and analyze traces and objects found at the crime scene. It helps document the exact location of each object and piece of evidence and simplifies the creation of a detailed representation (model) of the crime scene.

4. Collection of Samples for Examination and Expert Review

AI facilitates the analysis of data during the examination process, allowing for the automatic comparison of DNA and other biometric information. It also enables the storage of this data in a centralized database for further use.

5. Seizure and Search Procedures

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[14] *Taylor, R. (2021). Efficient Data Processing for Law Enforcement with AI. Journal of Security Management, 38(2), 143-158.*

[15] *Yamada, T., & Tanaka, A. (2022). Resource Optimization in Crime Investigation Using AI. Policing Technology Review, 33(1), 165-179.*

AI can be utilized to systematize items and documents obtained during seizure and search processes through an automated system. This process enables the organization of evidence, its electronic recording, and integration into the relevant database.

6. Listening to Communications and Extracting Information via Telecommunication Devices

AI enables the automated analysis of conversations conducted through phones and other devices, identification of keywords, and the overall analysis process. For instance, using audio from phone conversations, AI programs can automatically identify and mark significant words and phrases.

7. Investigative Experiment

AI facilitates the analysis and comparison of results from investigative experiments. During the process, actions can be recorded using video cameras, and AI can analyze each movement (trace) captured in the footage.

3.2. Analysis of the Scientific-Practical Results Obtained, Their Effectiveness, and Reliability

Conclusion: The implementation of artificial intelligence (AI) allows for the automation of numerous tasks within the investigative process, enabling time savings and enhancing the reliability of evidence. It is essential to develop specialized programs for each stage of the process, coordinate their integration, train personnel with the skills to utilize and analyze AI technologies, and establish and ensure the legal foundations of these systems.

Recommendations and Suggestions:

First, implement artificial intelligence (AI) systems that automatically record audio and video during interrogations, store these recordings for further analysis, and develop automated analysis systems for this data.

Second, integrate AI programs capable of recognizing individuals through video or images.

These systems, based on facial recognition algorithms, should store the results in a centralized database.

Third, utilize AI systems to scan crime scenes through video and photo recordings, analyze collected evidence and objects from multiple angles, and store the findings in a database.

Fourth, in forensic examination processes, it is recommended to use AI-powered programs for automated data analysis and comparison. Experts can analyze information using AI tools and connect it with updated data as needed.

Fifth, during searches, use specialized AI systems to record and digitize discovered evidence. Each item and document can be automatically entered into an electronic database through these systems.

Sixth, develop AI systems capable of automatically monitoring and analyzing conversations. These systems should notify investigators once specific words or phrases are identified.

Seventh, in investigative experiments, establish systems for recording and automatically analyzing movements through video surveillance and AI technologies.