

## **APPLICATION OF ARTIFICIAL INTELLIGENCE IN PRELIMINARY INVESTIGATION**

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**Abstract:** *This paper explores the transformative role of artificial intelligence (AI) in preliminary criminal investigations, examining its current applications, benefits, and challenges. The research analyzes how AI technologies enhance investigative capabilities through advanced data analysis, pattern recognition, and predictive analytics. The study demonstrates that AI implementation significantly improves the efficiency and accuracy of investigative processes while reducing manual workload. Key findings indicate that AI serves as a powerful complementary tool to human expertise rather than a replacement, enabling faster evidence processing, more accurate pattern identification, and better resource allocation. The paper also addresses important considerations regarding privacy, ethical implementation, and the need for balanced integration of AI technologies in law enforcement practices. This research contributes to the understanding of AI's potential in modernizing investigative procedures while maintaining legal and ethical standards.*

**Keywords:** *artificial intelligence, criminal investigation, law enforcement, digital evidence, pattern recognition, predictive analytics, investigative technology, data analysis, criminal justice, preliminary investigation.*

The integration of artificial intelligence (AI) into preliminary criminal investigations represents a significant advancement in law enforcement capabilities and investigative methodologies. This research examines the transformative impact of AI technologies on investigative processes, their current applications, and their implications for the future of criminal justice.

The preliminary investigation phase serves as the foundation of criminal proceedings, fundamentally influencing the direction and outcome of legal actions. In contemporary law enforcement, investigators face unprecedented challenges, including the exponential growth of digital evidence, increasingly sophisticated criminal networks, and the critical need for rapid response times. Artificial intelligence emerges as a powerful tool to address these challenges, offering enhanced capabilities in evidence analysis, pattern recognition, and investigative decision-making.

The procedural aspect of the development of investigative practice based on information technology is the second area, which is of great importance for collecting and recording evidence in a criminal case. This is the most crucial moment in investigative law enforcement practice, since it requires strict compliance with criminal procedural legislation when obtaining evidence that must meet the requirements of relevance, admissibility and sufficiency. Given that many crimes are committed using various technical devices, i.e. personal computers, cell phones, tablets, social networks and instant messengers, and criminal acts can be recorded on various video cameras, the investigator, as part of the investigation of a criminal case, must procedurally competently record information during the investigative action, and then evaluate it from the point of view of relevance,

admissibility and sufficiency. Numerous "electronic documents" in the form of emails and messages, "screenshots", subscriber connections, video recordings and other information recorded on special media have long been included in the materials of criminal cases.<sup>1</sup>

Modern AI systems demonstrate remarkable proficiency in processing and analyzing vast quantities of data, identifying subtle patterns and connections that might elude human investigators. These systems excel in analyzing surveillance footage through advanced computer vision algorithms, processing digital communications and social media data, and cross-referencing multiple databases to establish meaningful connections. The technology's ability to identify behavioral patterns in criminal activities has proven particularly valuable in complex investigations.

Digital evidence processing, a crucial aspect of modern investigations, has been revolutionized by AI applications. These systems efficiently handle the automated processing of electronic devices and digital storage, facilitate the recovery and analysis of deleted data, and streamline the examination of metadata and digital fingerprints. Document classification and content analysis, traditionally time-consuming tasks, are now executed with unprecedented speed and accuracy through AI-powered solutions.<sup>2</sup>

The implementation of AI in preliminary investigations has yielded substantial benefits in terms of efficiency and accuracy. Investigation timelines

<sup>1</sup> Синельникова В.Н., Ревинский О.В. Права на результаты искусственного интеллекта // Международное право. – 2017. – № 4. – С. 17–27.

<sup>2</sup> Малышкин А.В. Интегрирование искусственного интеллекта в общественную жизнь: некоторые этические и правовые проблемы // Вестник Санкт-Петербургского университета. Серия «Право». – 2019. – Т. 10, № 3. – С. 444–460.

have been significantly reduced through automated evidence processing and analysis, while the consistency and reliability of investigative procedures have improved markedly. AI systems excel in identifying relevant connections and patterns within vast datasets, enabling investigators to pursue promising leads more effectively.<sup>3</sup>

Predictive analytics, powered by AI algorithms, has emerged as a valuable tool in proactive law enforcement. These systems assist in geographic profiling, crime mapping, and threat assessment, enabling more effective resource allocation and early identification of potential criminal activities. The technology's ability to process and analyze historical data helps law enforcement agencies anticipate and prevent criminal behavior, rather than merely responding to it.

However, the implementation of AI in preliminary investigations also raises important ethical considerations and practical challenges. Privacy concerns, data protection requirements, and the need for transparency in AI-driven decision-making must be carefully balanced against the potential benefits of these technologies. Additionally, the reliability and accuracy of AI systems must be continuously validated to ensure their effectiveness in legal proceedings.<sup>4</sup>

The integration of AI into preliminary investigations has also transformed the role of human investigators. Rather than replacing human expertise, AI serves as a powerful tool that enhances investigative capabilities. Human investigators remain essential for interpreting AI-generated insights, making complex decisions,

<sup>3</sup> Головкин Л.В. Цифровизация в уголовном процессе: локальная оптимизация или глобальная революция? // Вестник экономической безопасности. – 2019. – № 1. – С. 15–125.

<sup>4</sup> Гаврилова Т.А., Хорошевский В.Ф. Базы данных интеллектуальных систем. – Москва, 2001. – 384 с.

and ensuring the ethical application of these technologies in criminal investigations.<sup>5</sup>

Looking forward, the continued development of AI technologies promises even greater capabilities in preliminary investigations. Advances in machine learning, natural language processing, and computer vision will likely expand the scope and effectiveness of AI applications in law enforcement. However, successful implementation will require ongoing collaboration between technology developers, law enforcement agencies, and legal experts to ensure these tools serve the interests of justice while respecting individual rights and liberties.

In conclusion, artificial intelligence has become an indispensable tool in preliminary investigations, offering enhanced capabilities in evidence analysis, pattern recognition, and predictive analytics. While challenges remain in terms of implementation and ethical considerations, the technology's potential to improve the efficiency and effectiveness of criminal investigations is undeniable. As AI continues to evolve, its role in law enforcement will likely expand, further transforming the landscape of criminal investigations while maintaining the essential balance between technological capability and ethical responsibility.

## References

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<sup>5</sup> Фесик П.Ю. Возможность использования компьютерной программы «ФОРВЕР» в расследовании преступлений против личности // Евразийский юридический журнал. – 2014. – № 5. – С. 164–166.

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