



MODERN TECHNICAL DEVICES IN CRIME DETECTION

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Article history:		Abstract:
Received: 28 th May 2024		In this article, the concepts of crime and criminalistics, which are increasingly relevant in today's world, are highlighted. It explores the diverse range of modern technical devices used in crime detection, offering an in-depth look at their types, advantages, and practical applications. By examining technologies such as DNA sequencing, biometric identification, and cyber forensics, the article demonstrates how these innovations enhance the efficiency and accuracy of criminal investigations. Additionally, the article discusses the convenience and effectiveness of these tools in identifying, predicting, and preventing criminal activities. Through a comprehensive analysis, the article underscores the transformative impact of modern technology on crime detection, contributing to a more effective and just criminal justice system.
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INTRODUCTION

In an era where technological advancements are rapidly reshaping various aspects of society, the field of crime detection has not been left behind. The integration of modern technical devices into criminalistics has revolutionized how crimes are investigated, solved, and prevented. As crime continues to evolve in complexity, so too must the tools used by law enforcement agencies. This has led to the adoption of cutting-edge technologies that enhance the precision and speed of criminal investigations [1].

This article delves into the essential concepts of crime and criminalistics, emphasizing their growing relevance in today's world. It further explores the use of modern technical devices in crime detection, detailing their types, benefits, and the convenience they offer in solving crimes. From DNA sequencing and biometric identification to cyber forensics and AI-driven analytics, these tools have become indispensable in the fight against crime. By examining these technologies, we can better understand their impact on the effectiveness of law enforcement and the broader implications for public safety and justice.

Thanks to the honour of national independence, the process of renewal that is being carried out in our country is reflected in all areas of social life. At the same time, social relations in socio-economic conditions are causing several practical issues in the activity of law enforcement bodies. This, in turn, shows the need to develop new methods of criminalistics development in our country modern technical means of crime detection, and their wide application in practice. First of all, let's talk about the concepts of crime and criminalistics [2]. A crime is a socially dangerous act (action or inaction) provided for by criminal law. The issue of considering a

specific act as a crime is decided in each country, taking into account the norms of international law in accordance with its social structure, the lifestyle of the population, national characteristics, customs, and traditions. To determine whether a crime is a crime, the following general signs are taken into account:

- 1) social danger of science;
- 2) presence of guilt;
- 3) punishability.

In any criminal act, all of these signs must be present at the same time, if one of them is not present, there is a reason to consider the act as not a crime.

MATERIALS AND METHODS

Criminology (lat. criminalis - related to crime) is a science that develops a system of special methods and tools for collecting, recording, researching and using forensic evidence, and using these methods and tools to expose, investigate and prevent crimes. Also, these methods and tools are used for consideration of civil cases in court. Advances in natural and technical sciences, in particular, the wide use of statistical and mathematical methods, computing machines, gas chromatography, television, radio, sound, image, writing, computer tools, etc., are the main principles of the development of criminalistics techniques. On this basis, the modern methodology of writing verification, i.e. "oral drawing of a face", obtaining various copies in trasology, etc. is formed. Criminalistics techniques include the use of technical weapons, such as special devices and equipment, in search and investigation activities. Criminalistics develops the tactics of criminalistics - a system of rapid search activities based on the generalization of the experience of investigating and preventing crimes, studying the methods used by criminals, and using the achievements in various



scientific fields. Techniques and tactics of criminalistics are widely used in criminal identification, investigative experiments, search and other investigative work. The set of methods, methods and tools used in the investigation of certain types of crimes, for example, murder (murder), theft, robbery, bribery and many other types, constitutes the methodology of investigation of certain types of crimes. In accordance with this methodology, the consistency and specific aspects of investigative actions, and rapid search activities are determined during the investigation of crimes and court proceedings, and the methods and tools of criminalistics techniques and tactics are developed [4].

Various means of detection are used during criminalistic practice. For example, we can cite the following: cameras, video cameras, tape recorders and VCRs, adhesive films, etc. Also, computer forensics can work without special forensic techniques. For example, the computer itself can serve as a universal enough weapon. Among the various add-ons and software, you will find all the information you need to learn the function. Some software devices can be easily created or modified by ourselves. However, special techniques make the job easier. Today, the following criminal weapons are available on the market: devices for cloning hard drives and other data carriers; devices for connecting disks being studied for hardware-locked writing; disks and other data carriers, software tools for forensic analysis of their contents; portable computers with software and hardware complex tools aimed at studying computer information in working conditions, a set of hashes (hash sets) for filtering the contents of the studied file systems; software tools and other tools for studying local networks [5].

Today, the investigator's workplace includes not only a computer but also special software, for example, "Investigator AIJ" (AIJ - Automated workplace) - which provides informational support for the initial investigation process, which allows for solving many information-analytical tasks during the investigation process. It is also assumed that there will be a complex of individual technical and software tools designed for automation.

One of the permanent departments of criminalistic technique; A few years ago, scientists were against the use of digital photography in forensics, but now it has almost completely replaced film photography. However, technology has become more modern and makes it possible to identify traces of crimes that have been detected during various criminal activities more clearly, accurately and easily. In recent times, modern technologies have advanced and made it

possible to more clearly and accurately determine the traces of crimes committed by various criminal acts. The first among such technical means is video. When researching a crime in scientific or educational literature, it is important to use criminalistic video recording to capture some movement, the dynamics of the development of the event, sometimes with sounds, in addition, the video recording can be used to capture large territorial areas or various objects that are collected in an irregular manner, changing it during the investigation [6]. Possible, for example, allows determining the situation in the event of a fire or disaster. That is, the main advantage of video recording compared to photography is the ability to capture the dynamics of changes in the environment and non-static moving objects. Video recording allows to accurately and completely determine the results and steps of the crime scene examination in the development of a suitable method. In addition, video recording, like photography, provides an opportunity to view the crime scene in a general, integrated, general and detailed way, and to identify crime traces in particular. By using such modern techniques, crimes are solved quickly, accurately and consistently [7].

THE EVOLUTION OF CRIME AND CRIMINALISTICS

Crime, in its various forms, has always been a dynamic aspect of human society. As criminal behaviour evolves, so too does the science of criminalistics, which encompasses the methods and technologies used to investigate and solve crimes. In recent years, the increasing sophistication of criminal activities has necessitated a parallel advancement in the tools and techniques used by law enforcement agencies. Understanding the core concepts of crime and criminalistics is essential to appreciate how modern technology plays a pivotal role in maintaining public safety and justice [8-10].

MODERN TECHNICAL DEVICES IN CRIME DETECTION

The advent of advanced technology has introduced a range of sophisticated devices that are transforming the field of crime detection. These devices can be broadly categorized into several types, each serving a specific function in the investigative process:

1. Forensic Tools:

– **DNA Sequencing:** One of the most significant breakthroughs in forensic science, DNA sequencing allows for the accurate identification of individuals based on their genetic material. This technology has become a cornerstone in solving crimes, particularly in cases involving violent offences where biological evidence is present.



– **Biometric Identification:**

Technologies such as fingerprint scanning, facial recognition, and iris scanning have become crucial in identifying suspects and verifying identities. These tools are not only fast but also highly reliable, providing law enforcement with the means to quickly narrow down potential suspects.

– **Ballistics Analysis:**

Modern ballistics tools can trace the origins of firearms used in crimes by analyzing the bullets and casings found at crime scenes. This technology aids in linking weapons to specific incidents, providing crucial evidence in criminal investigations.

2. Digital Surveillance Systems:

– **CCTV and Video Analytics:**

The use of closed-circuit television (CCTV) cameras has long been a staple in crime detection. However, with advancements in video analytics, these systems can now automatically detect suspicious activities, track movements, and even recognize faces in real time, significantly enhancing surveillance capabilities.

– **Drones:**

Equipped with high-resolution cameras and sensors, drones are increasingly being used for aerial surveillance, particularly in large-scale investigations or in areas that are difficult to access. Drones provide law enforcement with a bird's-eye view, enabling them to monitor situations from a safe distance.

3. Cyber Forensics:

– **Data Recovery and Analysis:**

In the digital age, much of the evidence is found within electronic devices such as computers, smartphones, and tablets. Cyber forensics involves recovering and analyzing data from these devices, even if the data has been deleted or encrypted. This is crucial in cases involving cybercrime, financial fraud, and other digital offences.

– **Network Monitoring and Security:**

Cyber forensics also extends to monitoring and securing networks against intrusions. Law enforcement agencies use advanced software to track and trace cybercriminals, often working in collaboration with cybersecurity experts to prevent and respond to attacks.

4. Artificial Intelligence and Machine Learning:

– **Predictive Policing:**

AI-driven analytics can process vast amounts of data to identify patterns and predict potential criminal activities. Predictive policing tools help law enforcement agencies allocate resources more effectively and intervene before crimes occur, thereby preventing incidents and enhancing public safety.

– **Automated Crime Analysis:**

Machine learning algorithms can analyze large datasets from crime reports, social media, and other sources to detect trends and correlations. These insights assist investigators in identifying hotspots, understanding criminal behaviour, and prioritizing cases.

Advantages and Convenience of Modern Technology in Crime Detection

The integration of modern technical devices into crime detection offers numerous advantages:

– **Increased Accuracy:**

Modern devices significantly reduce human error, providing more accurate and reliable results. For example, DNA sequencing has an incredibly high accuracy rate, making it a critical tool in exonerating the innocent and convicting the guilty.

– **Speed and Efficiency:**

Technological advancements have streamlined many investigative processes, allowing law enforcement to solve cases more quickly. Digital tools can process and analyze data at speeds far beyond human capability, accelerating the resolution of complex cases.

– **Resource Optimization:**

Predictive tools and automated systems enable law enforcement agencies to allocate resources more effectively, focusing on areas with higher crime rates or on cases that require immediate attention.

– **Improved Public Safety:**

By enhancing the ability to detect, predict, and prevent crimes, modern technology contributes to a safer society. The proactive use of these tools helps deter criminal activities and provides peace of mind to the public.

CHALLENGES AND ETHICAL CONSIDERATIONS

While the benefits of modern technology in crime detection are clear, there are also challenges and ethical considerations to address:

– **Privacy Concerns:**

The use of surveillance systems and data collection tools raises significant privacy issues. It is essential to balance the need for security with the protection of individual rights.

– **Reliability and Misuse:**

The reliability of technology is not infallible. There is always a risk of technical failures or misuse, which could lead to wrongful accusations or breaches of justice.

– **Cost and Accessibility:**

The deployment of advanced technologies can be costly, potentially limiting their availability to well-funded law enforcement agencies. Ensuring equitable access to these tools is a challenge that needs to be addressed.

CONCLUSION

The integration of modern technical devices in crime detection marks a significant leap forward in the



fight against crime. These technologies have transformed criminal investigations, providing law enforcement with the tools needed to keep pace with increasingly sophisticated criminal activities. As these devices continue to evolve, it is crucial to navigate the associated challenges carefully, ensuring that their use is both effective and ethically sound. Ultimately, the future of crime detection lies in the continued innovation and responsible application of these modern technologies, contributing to a safer and more just society.

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