THE LATEST METHODS OF MODERN CRIMINALISTICS

ZOZULIA Ihor,
Prof., Doctor of Law, National University of Internal Affairs, Ukraine,
ORCID ID: 0000-0002-3507-0012

STOROZHENKO Vileta,
Cadet of the Kharkiv National University of Internal Affairs, Ukraine,
ORCID ID: 0009-0003-4507-1638

Summary: The importance of innovative criminalistic technologies and research methods in solving criminal cases in terms of evidence collection and analysis and improving the effectiveness of the investigation is stressed. Special modernized and promising forensic technical methods in relation to certain branches of Criminalistics technology are considered.

Key words: innovative criminalistics, modernizing and promising methods, the effectiveness of crime investigation.

Modern criminalistics, also known as forensic science, is a multidisciplinary field that applies scientific principles to investigate crimes and provide evidence in legal proceedings. Modern criminalistics is constantly evolving and uses old and new technologies and research methods to solve criminal cases in terms of collecting and analysing evidence and increasing the effectiveness of investigations.

M.V. Zhizhina’s opinion that forensic innovations must meet the requirements of admissibility of use, ensuring the preservation of sources of evidentiary information, providing guarantees of scientific ability and reliability, their qualified use by relevant particular subjects, safety and efficiency application in practise, recording the conditions, procedure, and results of their application in documents [1, p. 35]. V. Yu. Shepitka’s statement that the implementation of innovations contributes to the optimization of the investigation, and the avoidance of investigative errors and can be implemented in such directions as 1) development and use of new scientific and technical means for identifying, collecting and preliminary research of evidence; 2) use of the latest information technologies in the work of the investigator; 3) development and involvement in the application of new techniques, methods, methods of conducting investigative actions and investigating crimes [2, p. 50].

As you know, in forensics both classical methods of dialectic and formal logic, as well as general scientific and special methods are used. The general scientific ones include observation, description, comparison, measurement, experiment, modeling and mathematical methods. Unique methods include technical and forensic methods with certain branches of forensic technology. Such methods of forensic photography are distinguished (enhancement of colour contrasts, colour separation, micro or macro photography, signaling photography, panoramic method, etc.); methods of forensic ballistics (expansion of a bullet or casing, a method of determining the location of a shot, establishing the model of a firearm behind a casing, etc.); methods of document research (inspection in oblique light, surface dusting with powders, method of photographic exclusion), etc. Unique methods are also identification methods (for example, establishing the whole by parts). Unique methods sometimes include forensic verification, forensic planning, forensic situation analysis, and forensic experimentation [3].

Accordingly, it is the modernised special methods of criminology due to the uniqueness, perspective and efficiency of the technologies involved in them, for example, expert [4], that have received the greatest development in recent times, and apply to the latest methods of modern criminology.
Such, for example, are genetic studies used to identify suspects and establish who was at the crime scene. Trace crime scene analysis is used to identify, analyze and compare traces of the crime, such as shoe prints and other physical evidence, to identify the person who left the traces and reconstruct the events that occurred at the crime scene. A variant is bio forensics – the analysis of fingerprints, hair, traces of blood and other biological materials that can be found at the scene of a crime. Forensic medical examination is used to investigate criminal acts related to medical issues. Allows you to determine the cause of death and assess injuries and their relevance to the charge. Forensic toxicology is used to investigate criminal acts related to the abuse of drugs and other poisonous substances. Allows to determine the presence of poisonous substances in samples of biological materials and their relevance to the accusation.

Ballistic analysis is used to identify firearms and ammunition and compare bullets and casings that may provide evidence of firearm use. Explosive forensics is used to investigate explosions and determine their causes. Allows you to determine which explosives were used and identify those responsible for the crime.

Electronic (computer) forensics is used to investigate criminal cases involving computers and the Internet, social networks, electronic financial transactions, and other virtual crimes. Enables the discovery and analysis of electronic evidence such as email, file systems, web pages, browser history, and other electronic communications; detects digital traces and restores lost or damaged information. Digital modeling is used to create virtual models of crime scenes, vehicles and other details. Forensic data analytics uses computer technology and statistical methods to analyse large volumes of data and information to identify patterns and relationships between various factors in cyber crimes. Mobile forensics is used to investigate criminal cases related to phones and tablets. Allows access to the location and history of calls and messages to establish motives and convict suspects. Social Media Analysis: Social networks can be used to obtain additional information about suspects and potential witnesses. It can help identify connections between different people and establish motives.

Voice examination is used to determine the authorship of audio recordings and voice messages, as well as to determine differences in accent, timbre, and other features of speech that can be used as evidence in court cases. Allows experts to use knowledge of the acoustic properties of the human voice to determine whether a voice in an audio recording belongs to a suspect. Graphological (handwriting) forensics is used to investigate criminal acts related to the misuse of documents containing handwritten text. Allows you to establish the authorship and authenticity of documents by comparing the handwritten text known documents that were written by the author. Document examination is used to analyze manuscripts, documents, and other materials that can be used as evidence in court cases. This allows you to establish the authenticity of documents and detect forgeries.

Archaeological forensics is used to investigate criminal cases related to archaeological objects. Helps establish the date and source of artefacts to investigate crimes related to the illegal removal of artefacts or destruction of historical monuments. Forensics of financial activity are used to investigate criminal actions related to a financial activity. Makes it possible to determine where the funds came from and how they were used, which can be useful in establishing motives and convicting suspects. Transportation forensics is used to investigate criminal cases involving transportation, including cars, aircraft, and ships. Allows to determine the cause of accidents and other dangerous situations on roads and other places. Fire forensics is used to investigate fires and determine their causes. Allows you to determine whether the fires were caused by hazardous substances, electricity, or other factors that may be related to criminal activities. Drone forensics is used to obtain aerial images for crime scene analysis and to find and collect evidence of crimes such as espionage, kidnapping, smuggling, escape and others. Space forensics is used to investigate criminal activities related to the misuse of space technology and space communications. Allows you to collect evidence that can be useful for investigating criminal cases related
to the misuse of space technology.

Therefore, scientists include the most important aspects of investigative practice in modern developments in the field of forensic techniques and methods, namely: new or existing technical and forensic means of investigative practice: modern information technologies, electronic knowledge bases, methods of recording, accumulating, analyzing and evaluating evidentiary information, new tactical techniques, their complexes, algorithms of priority investigative actions and verification of typical investigative versions, and methods for the investigating new types of crimes, etc.

As an example, I. Hel cites ten future forensics of the future, among which recognition of people by smart phones and other mobile devices with software to identify people in ideal conditions, for example having a high-quality photo in a database that you can compare in real time; compilation of a „genetic profile“ of a suspect, whose DNA fingerprints allow forensics to reproduce his physical likeness; prediction of the suspect's hair and eye colour; microbiological identification of a person as an effective tool for combating sexual violence; matching tattoos; morphometry (measurement of body shapes) to determine the skeletal remains of missing children; virtual autopsy by using three-dimensional models; pollen biomarkers; forensic examination of vehicles; portable police laboratory for field forensics [5]. V.I. Alyekseychuk adds the identification of a person by his external features through video systems, using thermal imaging technology, to the promising methods of forensics in the future; by voice, by articulation during the pronunciation of individual sounds, and words [6].

In general, modern criminalistics relies on a wide range of scientific and technological methods to analyse evidence and solve crimes. These modern criminalistic methods demonstrate the wide range of techniques and technologies used by forensic scientists and investigators to bring justice to victims. As technology continues to evolve, the field of criminalistics will continue to develop new methods and approaches to improve the accuracy and effectiveness of criminal investigations.

Bibliographic references:
3. Klasyfikatsiya metodiv kriminalistyky ta yikh vydy. [Classification of forensic methods and their types]. https://buklib.net/books/22869/ (in Ukr.).