

To be able to validate the performance of the three proposed algorithms we have employed 166 AM and 166 PM dental records provided by Dr. Kahana. All these dental records correspond to real forensic cases she dealt with along her career at the National Center of Forensic Medicine (Abu Kabir) in Israel.

The three algorithms performed accurately. The worst results were achieved by the 7 codes approach with a mean ranking of 2.73, i.e. in average the positive case is within the three first solutions in the provided ranking. Percentile 75% of the ranking is 1, i.e. in 75% of the cases the positive match is in the first

position of the ranking. Percentile 95%, i.e. in 95% of the cases the positive match is in the ninth position (or lower) of the ranking. Results of the other two algorithms will be provided during the conference as we are still developing further experiments.

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Criminalistics — from scientific findings of Mykhailo Vasylovych Saltevskyi up to artificial intelligence

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This paper will present the contribution of Mykhailo Vasylovych Saltevskyi to the development of the theory of criminalistics. The development of criminalistics from the time when outstanding scientists worked to the present is studied. The main emphasis is placed on the development and application of information technologies and artificial intelligence in criminalistics. It is emphasized that scientific criminalistic thought can be qualitatively developed by scientists who, first of all, are concerned not only with issues of theoretical developments but first of all develop the ethical foundations of science, without which modern and complex methods and technologies would not be applicable.

Keywords: criminalistics, information technologies, artificial intelligence, ethics.

Криміналістика — від М. В. Салтевського до штучного інтелекту **Александр Иванович, Наталья Філіпенко**

У статті розглянуто внесок Михайла Васильовича Салтевського в розвиток теорії криміналістики. Досліджено розвиток криміналістики від часів, коли працював видатний вчений, до сучасності. Головний акцент зроблено на розвиток і застосування в криміналістиці інформаційних технологій та штучного інтелекту. Підкреслено, що наукову криміналістичну думку можуть якісно розвивати науковці, які, передусім, переймаються не тільки питаннями теоретичних доробок, а насамперед розвивають етичні основи науки, без яких сучасні та складні методи й технології не були б застосовні.

Ключові слова: криміналістика; інформаційні технології; штучний інтелект; етика.

The main topic that is dealt with in our work can be formulated in the form of a question: what is the scope of Mykhailo Vasylovych Saltevskyi's work and engagement in the development and promotion of criminalistics? Also, Mykhailo Vasylovych Saltevskyi's work engagement, effort, dedication and systematicity can serve as an example of how and in what way an expert researcher can contribute

to the environment in which he lives and works, to his country, but also to the wider (European and world) scientific community. The scientific and professional reach of M. V. Saltevskyi could not be compared with the work of Edmond Locard (1877—1966), whom we consider the founder of forensics, and Ivan (Juan) Vučetić (1858—1925), who is associated with the first use of fingerprints in

the identification of persons, as well as Alec Jeffreys (1950-), who first introduced DNA identification in criminal investigations. However, M. V. Saltevskiy made a great contribution to the environment in which he worked! His contribution was not of a local character, the results of his work and research have a general meaning. During his work at National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute», from 1953 to 1962, he worked, among other things, on the development of forensic disciplines that were still in their infancy, such as forensic odorology and forensic acoustics. The year 1983 was a long time ago when DNA analysis was used for the first time, the most powerful weapon in criminal investigations, followed ten years later by the expansion of information technologies and their application in forensic science. So even in the years, when the aforementioned techniques and technologies were not available to experts and researchers for their identification application in criminal investigations, people like M. V. Saltevskiy felt within themselves the idea of contribution and prosperity.

Thus, in 1969, M. V. Saltevskiy successfully defended his doctoral dissertation on the topic "The theory of the basis of determining group affiliation in forensic expert examinations (methods of technical and legal problems)". This dissertation is a contribution to forensic science in cases where identification traces (DNA and fingerprints) are not available (which is quite common in practice), but when we have clues and clues to solve a criminal act. In these and such cases, the opinion of experts becomes important in order to increase the reliability of the available traces as evidentiary information. The significance and contribution of the work and activity of M. V. Saltevskiy are reflected precisely in the part of forensic research on the scientific classification of forensic evidence, in relation to which group affiliation and identity are confirmed. At the end of his working life, M. V. Salveskyi, full of life, professional and scientific experience, makes a great practical contribution to the fight against crime, by applying research into human speech, identifying the speaker and determining his psychophysical parameters. He also dealt with the application of computer programs, the use of witness statements, issues of systematization of signs of the appearance of persons, and proposed new methods of forensic and phonetic methods.

Forensic sciences, by definition, invent methods of other, most often fundamental sciences, after

which they are adapted and applied in order to find material traces at the scene of a crime, their analysis, examination and expert examination, all with the aim of elucidating criminal acts and identifying their perpetrators. Starting from the aforementioned definition, forensic sciences experienced a great expansion at the end of the twentieth century! Namely, in that period, forensic sciences began to apply methods of scanning electron microscopy, DNA analysis, highly sophisticated chromatographic methods, and especially methods of advanced information technologies. Modern forensic procedures are moving in the direction of minimizing (or even completely eliminating) the influence of the human-forensic expert when giving an opinion on a fact or trace, which is being examined. In the opinion of the author of this paper, this is to a large extent justified, because in this way, in forensics, the possibility of error is reduced to the smallest measure or it is completely eliminated. The modern forensic process relies on the implementation of new technologies, which largely eliminates human subjectivity of any kind!

Also, in the last twenty years, one of the most important trends in forensics is the accreditation and standardization of forensic laboratories. Accreditation, among other things, implies the creation of standard operating procedures (SOP), which serve as mandatory instructions and guidelines for the work of forensic scientists in every part of their work and engagement. These two segments of contemporary trends in forensics are particularly emphasized in the "Vision of forensics scientific area 2030", prepared by ENFSI (European Network of Forensic Sciences Institute), as a unique and monopolistic association of forensic laboratories in Europe. Thus, in the part of this document, whose purpose is the harmonization and balance of the development of forensic sciences with the aim of more efficient and reliable enforcement of laws in the countries of Europe, which part is called "Meeting the future", the part related to artificial intelligence in forensics is stated:

Applications of Artificial Intelligence (AI) is an umbrella term for explaining advanced computer intelligence. It summarises the efforts to simulate human cognitive thinking and decision-making, leading to machines able to use experience for learning, adapting, adjusting and revising to new inputs on basis of large amounts of data. ENFSI should explore the possibilities of using AI in processes relevant to forensic science.

Next, part of the document in question, entitled "Proving the reliability of forensic results", refers to the process of accreditation in forensics: *Quality and competence assurance are topics that are most relevant when exploring new techniques and procedures. ENFSI should promote the continuation of support in quality and competence assurance matters and also in relation to new demands that are relevant to new techniques or methods that are not yet fully established in the forensic community. Dissemination of information/training activities (including e-learning) on an expert working level and the conduction of proficiency tests/collaborative exercises are important tools to achieve this goal.*

At the end of this paper, they would state the fact that the application of modern techniques and technologies in forensic sciences and criminal investigations is of great importance in the direction of precision and reliability of the results of forensic examinations and criminal investigations. However, as Mykhailo Vasylovych Salteviskyi stated in his works, only with the help of experienced and well-trained forensic experts, who can think outside the box, only then can we have an optimal application of modern techniques and technologies, as well as artificial intelligence in forensic sciences and in an efficient manner, solve and investigate criminal offenses.

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Chronological discrepancies in forgery

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Forgeries are usually produced later to justify several claims based on the past. Forgers are often unable to reproduce the correct chronological frame because they currently experience different historical parameters in relation to the crucial date they refer to, making fatal errors of discrepancy.

Keywords: forgery; discrepancy; chronological; pathological.

Хронологічні розбіжності в підробці

Павлос Кіпоурас

Підробки зазвичай виготовляються постфактум, щоб підтвердити заяви, які базуються на подіях, що вже відбулися в минулому. Часто фальсифікаторам не вдається відтворити правильну хронологічну послідовність, оскільки вони спираються на різні історичні параметри, щодо важливої дати, на яку вони посилаються, і роблять фатальну помилку невідповідності.

Ключові слова: підробка; невідповідність; хронологічний; патологічний.