

BIOMETRIC FEATURES OF A PERSON AND FORENSIC IDENTIFICATION

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Abstract: The authors of the article deal with issues of misuse of the term of criminalistic identification replacing it with the concept of biometric verification. They point out that for biometric features of a person only those biometric features can be considered of people who are individually unique and unmistakable ever, verifiable and inimitable with another person.

Keywords: criminalistics, forensic identification, biometric features.

INTRODUCTION

The concept of biometrics is very often used and even abused in different contexts.

For example, in connection with securing of premises against intrusion by unauthorized persons, the opening of different databases, registration of persons, the protection of financial accounts, electronic form of the document, etc. Not always, however, the identifiers are chosen for the biometric data that are truly biometric. In security then there is the fact that these data are easily falsified and consequently unsafe. A forensic expertise is then powerless in those cases because of incorrect choice of the protective element. A common cause of this condition is superficial assessment of the importance of criminalistics and the selection is often conditioned only by commercial interests.

At this post we want to point out the mistakes we commit due to wrong interpretation of the findings of the forensic tracks, forensic identification and in particular the methods of forensic investigation.

Criminalistics is an interdisciplinary science, not only due to the fact that while examining forensic tracks it uses the methods of other sciences but it has also provided other sciences with forensic methods. The knowledge of criminalistics can

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be used in different areas of life in a society. In everyday life we are not even aware that the signature – such a simple operation to confirm the very significant acts – is actually the use of the knowledge of criminalistics on handwriting of a person on the constituent elements of the manual signature fonts. The use of rubber stamps is based on the knowledge of criminalistics of the inimitability of the relief at a micro level, the use of the photographs as a means of identification on various licenses, which is based on the knowledge of criminalistics on the uniqueness of the photographic portrait of a person, a description of the person, etc.

The different types of registers are based on the knowledge about one's relative stability as well as inimitability of forensic traits. Here it is necessary to point out that forensic traits are even traces of memory, which we usually include in the existing system of criminalistics to criminalistic tactics.

In the Slovak Republic in recent years we also started to exploit more fully the knowledge of criminalistics on the identification of the person, and this for a variety of purposes – mostly for the security of objects of a different kind. Generally known are personal computer security systems against misuse of data based on the voice and the imprint of a finger, securing, opening and closing doors, but also to secure the deeds and documents. Recently the hot topic is also an electronic form of the document, the problem of ensuring the safe conversion of written documents to electronic documents by performing a visual check of a document and the subsequent narrative description of all the visible security features, the introduction of an advanced electronic signature with time stamp, but in particular the possibility of using the handwritten signature by using a touch tablet with special pen introduced by some banks, mobile operators, etc. This type of signature is massively promoted compared with advanced electronic signature (EP or KEP) as a less expensive, more readily available, and even as a more secure (Krajnikova et al., 2014)!

Extremely quickly and with a wide range of activities, various types of information technology are being used for the purpose of ensuring and simplifying various – mostly administrative – actions. These technologies are based on various features, dispositions and characteristics of the persons that we call summary biometric data – the biometric identifiers. The concept of biometrics here actually reflects the characteristics of a “live” person given the biological nature. Emphasized is the fact that any change to these characteristics is either factually impossible or would require such interference with the integrity of the person, that it is very unlikely that the person would be willing to undergo such interference, or that it would find the apparatus that would be legally able and willing to do it.

The term “biometric data” became “discreetly” and almost automatically associated with a term “forensic trait”. It relies on the fact that it is given once and for all and that there are no doubts about its individuality because the criminalistics is using it for the purpose of individualization. But it is not as simple and direct as that. The feature of the person who creates a forensic trait, or is directly a foren-

sic trait, can also be the biometric data. However, not every feature of a person, which can be a forensic trait, is in fact also a biometric data.

It is necessary to deal with the term “biometrics”. If you have the space for this concept of defining a living person, we need to emphasize that biometric data are those that can be responsibly used for individualization of the person, or biometric verification. They are, however, (if we adhere to the principle of science) in criminal practice proven and recognized characteristics – the parts of the human body that make up the forensic traits. Certainly, there is not a signature among them, nor the voice of a person, nor the smell of a person. It means those data, which make up the forensic traits, but traces of the functional and dynamic properties of the examination are basically different. A fundamental difference is that, in the examination of such forensic traits it is necessary to evaluate and explain the natural differences and inaccuracies, and they can still lead to individualization of the person (e.g. mechanical differences in font, signature). On the contrary, if the traits resemble or even overlap, it may not lead to individualization of a person. Signature, which at first glance resembles, or is almost identical with another signature, may not to be the result of the handwriting of the same person. Evaluation of external characters is considerably easier, but not easy. We can make use of information technology resources, which, in any case “fail” to assess the individuality, which does not mean that they can be good helpers that can simplify the examination, but not replace.

This reasoning also has practical consequences. Such biometric characteristics cannot be evaluated without special training, and it requires several years of systematic training.

The question that remains unanswered is what the real individual biometric data are, whether it is the shape of the retina of the eye, the shape of the veins on the hands or feet, the relief of nails and feet. These are the questions that criminalistics does not evaluate them as forensic traits also due to a fact that these characteristics do not often form forensic traits. Its characteristics – if they remain relatively still, individual and fixed, might be biometric data. Traces of the functional and dynamic features, however, are not biometric data. Thus, manual font, signature, voice of the person, walking, the smell of a person are not biometric data of the person!

What is the relationship between the biometric identifier, biometric data, and personal data?

In section 4 part 1 of the Act No. 122/2013 Coll. on Protection of Personal Data and on Changing and Amending of other acts, resulting from amendments and additions executed by the Act. No. 84/2014 Coll. the creator of the Slovak Act defines personal data as „any information relating to an identified or identifiable natural person, while such person is one who can be identified, directly or indirectly, in particular by reference to an identifier of general application or by reference to one or more characteristics or factors specific to his physical, physiological, psychic, mental, economic, cultural or social identity“ (Act

No. 122/2013 Coll. on Protection of Personal Data and on Changing and Amending of other acts, resulting from amendments and additions executed by the Act. No. 84/2014 Coll.). According to the methodological guidance of the Office for the protection of personal data no. 6/2013 of 28.11.2013, the Office defines the biometric data as follows: biometric data is the “personal data of a natural person that identifies its biological or physiological characteristic or characteristics, on the basis of which it is clearly and individually determinable; biometric data in particular is fingerprint, palm print, analysis of deoxyribonucleic acid (Methodological Guidance of the Office for Personal Data Protection No. 6/2013 of 28.11.2013). In the next paragraph of the same methodological guidelines there is addition for the calculation of the biometric data as follows: “Biometric signature, walking, etc.”, with which it is not possible to agree from the point of view of criminalistics and forensic identification. Under the abbreviation “etc.” it is not specified what the creator of the methodological guidelines had in mind, but practice proves that as a biometric data, for example, in the banking sector, in addition to the signature on the touch-sensitive tablet and pen they are making use of the human voice. The creator of a methodological guidance notes that “the value of biometric data is based on the universal biometric element, or sample, which implies the uniqueness (distinguish the individual from others), stability (individual maintains the individual element throughout the life) and measurability-characteristic/feature is comparable and quantified (Methodological Guidance of the Office for Personal Data Protection no. 6/2013 of 28. 11. 2013).

Is the signature of the person seen as a personal, biometric data? The signature is the result of a handwriting of man (bio) and has its (metric) signs. Metric signature characters are: the inclination of letters, character strokes, and the total size of the signature, the ratios of the heights, widths, shapes and letters. This means that these are the characters that are measurable. The analysis of the measurable characters of the signature is insufficient for the forensic identification, because these characters may appear as similar, consistent with two different writers at the same time and on the other hand, the signatures of the same author may be different. For the forensic identification of the author's signature the morphological characteristics of the signature are essential. Any signature that is unreadable (learned by practice signature, signature brand, or abbreviated signature “para-fa”), it is not possible to read the text of the name of the person. Therefore, no signature as an isolated phenomenon can be a personal data and as mentioned above, quite logically, biometric data.

In forensic examination of a signature some of the basic axioms apply:

- No two genuine signatures of the same author are, nor can ever be absolutely identical. Narrowing down the match to only metric characters would mean incomprehension of the forensic identification.
- Two genuine signatures of the same correspondent reported similar, identical and different characters.
- Different characters in two or more genuine signatures are an expression of the natural variability of expression of the same author's variability of handwriting.

- Variability in the expression of handwriting itself is a valuable feature of the identification.
- Each one of the signatures, which is the subject of a forensic examination, can be genuine signature, intentionally or unintentionally changed author's signature, imitated signature, drawn up by using one of the methods of a technical or mechanical tampering.
- The forensic identification of the writer of one signature requires a sample comparison of signatures (approx. 15-20 samples of signatures), which must come from an objective source, and of a comparable period of time. Only under these conditions it is possible to examine the variability of writer's expression. Figuratively expressed: it is possible to compare apple to apples at each other, from the same tree, and from a single harvest.
- Signatures change over time. Their characters are not only affected by the time (the author's age), but also the quality of the pads, the type and quality of the resource, the author's mental and physical health at a particular time.

One writer can use several types of signatures, when compared they show different characters.



Figure: 1 *The signatures of one and the same author showing different characters*

At present the writers, but also for example, banks in asking for specimen signature, pay less and less attention to the signature. Formally (by law or some sort of mandatory regulations, regulation) it is not provided what form should signature have ("how many" and "which" characters should contain), and so it is actually possible for the article to instead of the text or learned by practice signature to use abbreviated signature "parafa", which often consists of one simple letter, a tilde — and if we exaggerate - three crosses. Such signatures are very simple, they do not contain a sufficient number of identifiable valuable characters, and therefore they are vulnerable (easily imitable). If the signature is used only occasionally, the reason that the writer does not work and prefers the electronic form of communication – then his signature often does not have a steady (a practiced enough) appearance.

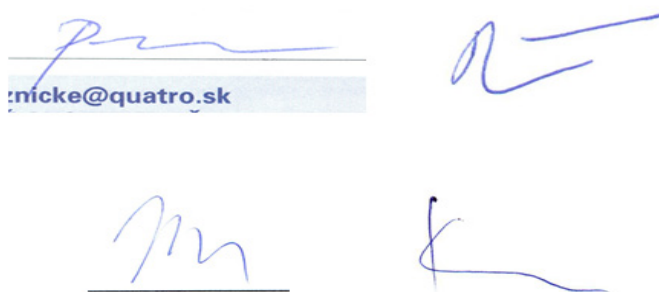


Figure 2: *Examples of simple, easily imitable signatures of four writers*

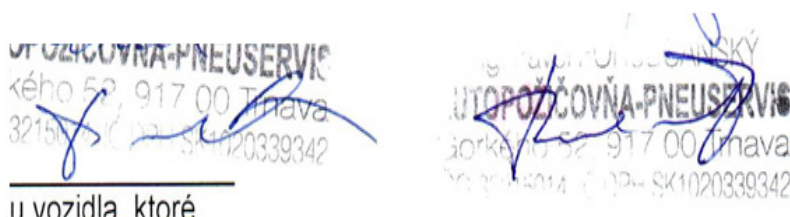


Figure 3: *An example of unsteady signatures of the same author*

The biometric data can be treated as patterns of papillary lines, shape of blood vessels of the retina of the eye, the shape of the ridge of the veins on the parts of the body, relief of the nails and the like – characters whose shape is relatively stable, and that as the forensic tracks are among the signs of external shapes. Their examination is possible by comparing, which is carried out by technical means, relatively easy to make.

Among many other definitions of biometrics the one that captivated our interest defines biometrics as the application of biostatistics to identify people. This finding is telling us to be cautious about this argument. A statistical assessment cannot be used to identify objects. Thus, it is necessary to establish the exact term of the problem that indicates that we are talking about forensic identification.

All the existing biometric methods so far do not guarantee neither theoretically nor practically system failure and they are applied (just to be on the safe side) only where “it is not a life” concerned but “only money”.

Such an approach, however, criminalistics “cannot afford”. It cannot approve the methods, in which the accuracy is at 60-70%. We have to acknowledge that even the forensic methods are not in the scientific sense of the word 100%. And they cannot even be if we regard them as scientific methods, because scientific is just what we may have doubts about. And we may doubt the results of the forensic investigation, but their “accuracy”, or more precisely, the accuracy of the identification is at 99%. We are talking of course about the individual identification (Krajník et al. 2005), when based on forensic examination we individualize the object based on the above “statistical standard”. Yes, the criminalistics uses and works with statistics,

but does not make conclusions about the individualization of objects based on it. Therefore, the criminalistics is not “perfect”, not completely scientifically - mathematically accurate. The conclusions are based on one’s own policies and procedures, which are so difficult, they are not “yet” mathematically or statistically solvable.

The basic problem, which in the current effort to utilize the use of biometrics they could not avoid is that they built their methods for finding certain characteristics - in particular the characteristics of the human body, but these properties were not sufficiently explored. Otherwise they would not be able to rely on the shape of the lid slit, eye ground, height, facial features etc. to individualize a person.

Criminalistics is not science because it refers to various types of characteristics of objects, but because it has and develops methods for examining these objects and their properties, so as to make it possible to individualize these objects.

Methods (of science) are critical attributes of the science, not the properties of the objects. There are many features that criminalistics refuses to examine for the individualization of a person, just because **they are not sufficiently scientifically researched** - cheiloscopy, poroscopy, nail shape, body language, facial expression and gait.

CONCLUSION

At present there are more and more emerging efforts to interpret the lessons of criminalistics in different areas of life. We can be quite bold to say that with the development of computer science forensic methods are readily available for study to more and more users.

It is understandable that this knowledge many people are trying to use for their own needs and goals. The most common area of knowledge is the area of the individualization of the person. This is understandable, because the person is very often a source of forensic traits in the most serious criminal offences. As such, it creates three kinds of forensic traits-traces of external characteristics, functional and dynamic properties and biochemical clues to track the composition and physiochemical structure. In the case of a person, we would be able to track external characteristics of a person called biometric identifiers - because they represent the characteristics that are customized to the individual parts of the body of a person.

In the use of the knowledge of criminalistics by the general public, there is a wrong use of the concept and it also includes the characteristics that are not permanent and are not examined for forensic identification. This means that the outward signs of a person as forensic traits are (can be) biometrics. However, not all external signs are biometric.

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