

J16 A Best Practice Manual for Forensic Examination of Digitally Captured Signatures (DCS)

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Learning Overview: The goal of this presentation is to introduce attendees to the problem of the examination of authenticity of DCS with respect to the methodology for traditional pen and paper signatures.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by ensuring attendees will be familiarized with the product of the research project (i.e., the additional appendix to the Best Practice Manual of European Network of Forensic Handwriting Experts [ENFHEX] that deals with DCS analysis) so attendees will have a compass to address the issue.

Recent years have seen the increasing use of DCS (also known as biometric or dynamic signatures) for the authentication of electronic documents (e.g., Portable Document Formats [PDFs]). There have also been the first cases reported of forensic examination of such signatures commissioned by judiciary bodies. However, examination of DCS differs from that of conventional (pen-and-paper) signatures, not only on the traditionally examined characteristics that derive from the dimensional measurements, but also on the recording and examination of the dynamic characteristics of signature formation—as DCS technology allows capturing of both time and force on the Z-axis—marking a shift from qualitative to quantitative analysis.

Therefore, the ENFHEX, a Working Group of the European Network of Forensic Science Institutes (ENFSI), found it necessary to define rules of good practice for forensic examination of DCS. In the years 2018–2020, a research project called STEFA G8 was carried out, which resulted in the development of a relevant appendix to the Best Practice Manual (BPM) for Forensic Examination of Handwriting, used by ENFHEX member laboratories since 2015.¹ In the document, new DCS-specific terminology was introduced, an overview procedure DCS analysis and comparison proposed, and the following subjects were discussed: division of tasks between Forensic Handwriting Examiners (FHE) and forensic IT, the notion of an original in digital evidence, as well as hardware- and software-related subjects.

In addition to the BPM, a list of requirements was produced that aimed to make the signature data as suitable to forensic examination as possible. These recommendations are directed to DCS-related hardware and software manufacturers and users as well as for legislative bodies that are responsible for legal regulations related to the subject.

Furthermore, experimental research was conducted to answer the following questions: (1) Is writing behavior any different between signing digitally and signing on paper, and therefore can conventional samples be used as reference material when a DCS is disputed, and vice versa? It was found out that despite statistically significant differences in particular features between DCS and pen-and-paper signatures observed, no general tendency of different signing behavior was noted, which could carry the risk of erroneous conclusions in casework. This led to the conclusion that comparing DCS and conventional samples is justified; and (2) Are there any differences in the structure of biometric data that were captured with different hardware and software combinations? The results indicated that such differences may indeed occur and, therefore, data may not be directly comparable. Moreover, different ways of coding certain signature features were detected. Therefore, before the forensic examination, it may be necessary to scale and normalize signature data. Measures are proposed to conduct such operations.

Apart from the tasks accomplished by the STEFA G8 Project Team, future plans and capabilities that even involve the creation of DCS-related databases will be discussed as they derive from the products of the aforementioned research.

Reference(s):

¹ <https://enfsi.eu/docfile/best-practice-manual-for-the-forensic-examination-of-handwriting-version-02/>.

Handwriting Examination, Digitally Captured Signatures, Best Practice Manual