

Forensic Document Examination and the PenOp Dynamic Digitized Signature Technology

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Forensic document examiners conducting studies of questioned signatures have long held that examination of non-original signatures limits the degree to which determinations can be rendered. The advent of digitized signature images, such as those commonly used by UPS delivery personnel for confirmation of deliveries, present a unique problem for the document examiner. The use of such digitized images, in which no traditional original writing exists, is a product of the desire by government and industry to decrease the amount of paper records. It is also a product of the increase popularity of digital commerce (such as credit card purchases over the Internet).

Forensic document examiners are, therefore, at a difficult crossroad; are digitized signatures something that can be appropriately examined and can reasonable conclusions be drawn from the evidence available from such non-original writing, sans the many aspects of writing which cannot be digitally reproduced, or does such non-original writing prohibit reasonably well based conclusions from being formulated?

While no technology exists which can completely replicate the many physical characteristics of the traditional "pen on paper" signature, advances are being made in both the quality and quantity of digitized signatures. The dynamic digitized signature capture technology developed by PenOp is, in many respects, a superior method of signature digitization. It combines the security of numeric coding with the use of more traditional handwriting characteristic based information for writer identification.

The author, a self professed application power user, is by no means a programmer or computer specialist. However the author is a competent document examiner who has spent some time using the PenOp technology. This technology does not eliminate many of the problems which plague examination of the more traditional signature, but it does significantly improve on the quality seen in digitized signatures and also adds new areas of study the document examiner has never been able to consider in the past. These areas can, in the author's opinion, add to the overall effectiveness of accurate authentication and also provide previously unseen data, which will be extremely valuable in research and study of the action of writing.

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Forensic document examiners use known genuine specimen signatures in appropriate quantity as a group of writings from which repeated characteristics (both the more common class and more distinctive individual identities) are considered, as a basis for observing the more general habits of a given writer (such as size of letter forms and height relationships between letters) and as a basis for observing the range of variation between signatures (no writer is capable of producing two identical signatures).

When these and other types of evidence found among a group of known genuine signature specimens have been thoroughly considered, secondary comparative analysis between those signatures and a questioned signature are then conducted. In the most basic of terms, the question to be resolved is whether or not any portion of a questioned signature fall significantly or fundamentally outside of the characteristics exhibited by the known specimens.

The most pressing difficulty of examining non-original signatures is the lack of evidence, which can be considered. The document examiner's confidence level decreases when he or she is prevented from looking at all of the evidence the traditional signature offers in many instances.

While the PenOp technology does not offer all of the benefits of the traditional inked signature, it does come close. In addition, it allows the document examiner to consider previously unknown data. The primary types of this data involve quantification of speed of execution. The types of evidence most readily distorted or eliminated in non-original signatures are those that show a document examiner speed of writing execution. Imitations of a writer's signature may be accurately created with care and practice, but the speed of preparation is the element that will suffer the most in a typical attempt at imitation. Unfortunately the subtle aspects of line quality, re-touching, unusual lifts of the writing instrument and pauses in the writing process are those which are most likely to be hidden in non-original signatures.

The PenOp technology makes a quantified recording of not only the forms and appearance of a signature, but also records such things as speed of execution and off writing surface time. Such data would be extremely valuable in the determination of whether a writing suffers from unusually laborious preparation, or is written in a careless, fluid and rapid fashion. These recordings will also allow document examiners to study the action of writing and provide valuable new information about how writing is prepared. This is an extremely exciting development and will lead to a greater understanding of writing and, in particular, the distinctive type of writing represented by the signature.

The continued use of the manually executed signature as a means for human beings to offer acknowledgment, approval, communication and identification is important. Signatures are something that people have and continue to feel very comfortable with, but more importantly, they remain a unique and a far more "natural" and basic means by which people indicate personal acknowledgment. The fingerprint or retina scan can be performed on the unwilling or unknowing subject, but the act of producing a signature is something that demands full participation by the writer in a complex and intricate action that demonstrates a greater degree of consciousness and awareness.



The PenOp technology combines the natural act of writing with numeric security in a fashion that is far superior to pure numerical security devices (such as Personal Identification Numbers). It also offers a recording from which the forensic document examiner can attempt accurate determinations of authenticity to a greater degree than from other reproduction media.

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