

ABSTRACTS

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The Use of Principal Component Analysis to Provide Objective Methods for the Examination of Arabic Signatures

Ahmed Al Haddad, Peter C. White, Anthony M. Cowell

The natural variation within an individual's Arabic signature is studied using Principal Component Analysis (PCA) with orthogonal rotation of the components. Fifty replicate analyses of sixteen features, measurable or classified by a numerical coding system, were analysed for a legible and an illegible type of signature. With either type of signature this PCA method provides an objective, robust and simple routine for identifying the features and importantly associations between features. Using only the measurable features, the results from two trials proves the method could potentially assist in confirming the authenticity and identifying forgeries for both legible and illegible types of signatures. From studying the effect of sample size it is recommended that no less than twenty-five control signatures should be used to ensure reproducibility and confidence in reporting any results when using this statistical method of analysis.

Online Proficiency Testing for Signature Comparison by Forensic Document Examiners and Non-Examiners

Lindsay Holmes, Brent Ostrum, Andrew Barton

The present study was conducted to develop and test a new online method of proficiency testing for the completion of a signature comparison trail. The web-based test consisted of 14 specimen signatures and 50 questioned signatures with the latter consisting of 8 'genuine' signatures and 42 'simulated' signatures. Opinions regarding the authorship of each questioned signature were submitted by a group of 32 Forensic Document Examiners (FDEs) as well as a group of 32 non-examiners. Results from the online test for FDE participants were compared with the results from a paper-based signature comparison trial conducted by La Trobe University Forensic Expertise Profiling Laboratory that had used signatures from the same specimen writer and simulators. This comparison revealed that there was no significant difference between the FDEs who participated in the online study and the FDEs from the La Trobe study. In addition, FDE participants performed better than the non-examiner group, providing more correct opinions and fewer misleading opinions. The results of the study provide further validation of the existence of an expertise in the area of signature identification. Support is also provided for the use of online proficiency testing as an alternative to the traditional paper method.

The Effects of Constraining Signatures

Dainis Simsons, Rosalind Spencer, Sofia Auer

Forensic document examiners are often asked to determine the authenticity or otherwise of signatures on official government forms, most of which use a line or box for the signature space; but the extent to which such lines and boxes affect a natural signature is relatively unknown. Six types of constraints encountered in everyday signature examinations were investigated. All constraints significantly affected the size of the signatures, and anomalies appeared in the constrained signatures (extra artifacts, reduction in complexity, lack of fluency, and hesitation marks).

Liquid Lead Pencils Revisited

Brenda N. Lanners

In most cases, a Forensic Document Examiner has little trouble differentiating between the stroke made by a pencil and one made by a rollerball pen or a ballpoint pen. The liquid lead pencil, however, presents a more challenging stroke appearance which is a hybrid of the fluid ink of a rollerball pen and the striations of a ballpoint pen. This study will compare characteristics of the stroke lines of liquid lead pencils, graphite pencils, ballpoint pens, rollerball pens and gel pens, on original and photocopied documents. Forensic Document Examiners should be aware of the stroke characteristics of a liquid lead pencil when making a determination as to the writing instrument used on a document.