

2014 ASQDE Meeting Abstracts

Presentations:

Aginsky, Valery

Ink Aging Testing: Do Preceding Indentation Examinations Affect the Ink Aging Parameters?

Abstract: This paper discusses various aspects of two ink aging methods that analyze ink volatile components, Sequential Extraction Technique (SET) and Solvent Loss Ratio Method (SLRM). Multiple ballpoint ink writings of various ages were tested by the SET and SLRM both before and after the pages bearing the writings were examined for indented writing impressions using an electrostatic detection apparatus (ESDA). The results obtained show that the indentation examination does not cause any significant changes to the ink aging parameters that are measured by the SET and SLRM.

Alzaabi, Saqar

In Situ Analysis of Ink Lines Made by Blue and Black Ballpoint Inks by Reflectance and Luminescence Spectroscopy Using VSC6000HS

Abstract: In situ discrimination of blue and black ballpoint pen ink lines on paper was performed using the visible-infrared reflectance and infrared luminescence spectroscopy functions of the VSC6000HS. Ink lines from 30 blue and 30 black ballpoint pens were examined. It was found that about 92% and 94% of the ink lines of the blue and black ballpoint pens respectively could be distinguished using these methods.

The outcomes of this project demonstrated that this methodology of differentiating ballpoint inks did not only provide reproducible results, but also offered a satisfactory, simple, rapid, nondestructive and objective way of differentiating ink entries of blue and black ballpoint pens.

The results of the study also demonstrated that the VSC6000HS has improved compared to VSC5000 that a previous study had concluded was of no value in ink differentiation analysis of ballpoint inks of the same color by the use of reflectance spectroscopy.

The results have also demonstrated that the paper color has an effect on reflectance and luminescence spectra obtained by VSC6000HS. As a result, comparing ink entries on different colored-paper substrates by these methodologies is not acceptable.
Choi, Jinwoo, Chris Anderson, Mijung Choi

Understanding Korean Writing and Characters for non-Koreans: A Practical Guide to Handwriting Comparisons in Korean for FDEs Using the Correlation between Hangul and Chinese characters

Abstract: This paper provides a practical approach for forensic document examiners to undertake handwriting comparisons of Korean writing (Hangul) by providing an understanding of the Korean characters. This paper details the close correlation between the Korean characters and their formation with the characters from the Chinese alphabets using the traditional vertical and syllable based Chinese writing method as a template.

The research came about due to the infancy of handwriting examinations in Korea, how little Korean writing is understood in Western countries, and value for forensic document examiners in understanding the origins of Hangul and its links to Chinese writing and calligraphy.

There are many differences between the Korean and Chinese phonetic writing systems, including the grammar, the character style and the origin of these characters. What links them is the manner in which they are traditionally written, that is their penmanship.

In this presentation, we have three objectives: (1) To highlight the common factors present between Chinese characters and the characters of the Korean alphabet; (2) From a handwriting comparison standpoint, we analyze common denominators between traditional writing by vertical writing habitue and syllable writing based square frame; (3) To compare and present differences between the English and Korean alphabets based on their writing structures.

It is also hoped that this article will serve as a platform from which further studies of greater depth and specificity may be undertaken.

Devlin, Andrea

The History of Forensic Document Examination in Australia

Abstract: At the 2010 ASQDE Meeting, Timothy Campbell presented the history of forensic document examination in Canada. A similar history has been collated for the profession in Australia. Information was gathered from past and present Australian document examiners. Mr Campbell provided a template for a wiki which was used to record and organise the Australian information. The author plans to update the wiki on a periodic basis in order to continue recording the movement of document examiners in Australian laboratories. To visualise the history of forensic document examination in Australia, a timeline was constructed showing the period each examiner spent at each laboratory. Projections were made on the future of the profession in Australia.
Abstract: Ink dating is an examination method of questioned document that can be based on the analyses of time dependent chemical changes within ballpoint ink entries on paper.[1,2] Components of ballpoint inks are solvents, dyes, resins, binders and further additives. In recent years new analytical methods have been developed for dating questioned documents up to seven months. These methods are based on the detection of the solvent phenoxyethanol.[3]

Because of their high molecular chemical structure, resins and binders are suitable for long term age determination but until now there is only marginal knowledge about aging behaviour and degradation products of these compounds.

The BKA developed a HPLC-UV method to detect phenoxyethanol in ballpoint ink that is used in casework.[4] Furthermore a new method for high sensitive detection and identification of resins and binders was developed. This includes sample preparation, chromatography (HPLC) and high resolution mass spectrometry (HRMS). Different ionization techniques were applied, including Electrospray Ionization (ESI), Nano Electrospray Ionisation (NSI), Atmospheric Pressure Chemical Ionization (APCI) and Direct Analysis in Real Time (DART). Until now positive ESI is the most promising and appropriate ionization method.

A great number of resins, binders and additives were analysed and characterised by HPLC-ESI-HRMS, MS2 and MS3 and a database of those compounds was created. This new technique facilitates the distinction between different ballpoint pastes by the identification of resins and binders used.

But even more interesting are the experiments on aging of resins and binders in ballpoint ink entries. A slow degradation of resins can be observed, and some can still be detected after 10 years. Other resins show faster decomposition and after a few years they are no longer detectable. For those experiments the ballpoint entries on paper were stored in the dark.

Aside from experimental work and in order to gain more information about the analysis of resins and binders a questionnaire was distributed to EDEWG (European Document Expert Working Group, working group of the European Network of Forensic Science Institute, ENFSI) member labs and the evaluation of this questionnaire will be briefly summarised.


Hanson, Lisa

A Study of the Development of Individual Handwriting Characteristics in 1800+ Students as They Learn Hand Printing and Cursive Writing in Primary School and Their Progression

Abstract: This presentation will be the second presentation involving this research. The preliminary presentation involving the first year data was given at the ASQDE Conference in Indianapolis in 2013. This research project is being conducted to find a clearer understanding of the time period involved and the development of individual handwriting characteristics within children's cursive and printed writing. This study is being conducted over a three-year span: the first year when the most intense instructions are given and Copy Book is used as a visual example; the second year when the Copy Book is removed and is not visually available or needed by students; and the third year as students are expected to develop additional individual handwriting characteristics. There is a request that this study be expanded to follow the initial second graders through their senior year of high school; however, this is will not be known until a later date.

Handwriting and hand printing is being collected from over 2000 students who each produce four paragraphs of writing each: 2 cursive paragraphs and 2 printed paragraphs. This process is being repeated three times toward the end of each school year from 2012 to 2014. By tracking each student's writing habits every year and by having the students produce the same requested paragraph year after year, all the writings collected will be intra-comparable to each student as well as comparable to all of the other student's writings.

Lisa Hanson, as well as other qualified Forensic Document Examiners, have and will identify individual characteristics as they develop in each student's writing samples. The samples are scanned and then analyzed using handwriting software called iFOX using the Truthing Tool. The data collected is then statistically analyzed to develop likelihood ratios. These likelihood ratios will detail how often one will expect to see these individual characteristics and/or combinations of these individual characteristics.

The data and results from this study will be used to validate one of three basic statements made by Forensic Document Examiners when they are asked to explain why handwriting comparisons are able to be conducted. The first being no two people write exactly the same. The second being no one person writes exactly the same way twice. And the third is that individual handwriting habits and/or characteristics develop as students move away from the Copy Book style s/he is taught in school. It is this last statement that will be statistically validated by this research.
Herlaar, Koen

Measuring Magnetic Properties to Discriminate Between Different Laser Printers

**Abstract:** Magnetism used to be a qualitative property to discriminate between different laser printers: magnetic single-component toners versus non-magnetic bi-component toners. Within the examination of security documents, quantitative measurements of magnetic properties are used to discriminate between genuine and counterfeited documents. The question has risen whether quantitative measurements of magnetism can also be used to discriminate between printers which use magnetic single-component toner. This paper presents a preliminary evaluation of this technology on normal laser printed documents.

This study uses 78 print samples from 23 different laser printers which all use magnetic toner. For each sample the flux and magnetic induction of the toner is measured on several locations with the Regula Magmouse Model 4197. Different comparison algorithms to discriminate between printers are studied within the Bayesian Likelihood-Ratio framework. Furthermore, repeatability and reproducibility of the Magmouse are studied.

This study shows that this technology has the potential to discriminate between different printers. The Magmouse is easy to operate and measurements can be done quickly without contaminating, damaging or destroying other traces on the document. Furthermore, the measurements are independent of the paper substrate on which is printed. However, the range of application is limited to documents printed with magnetic single-component toner.
Holt, Melanie, Alison Sears and Chris Lennard

Sequencing ESDA Examinations With the Collection of Trace DNA from Questioned Documents

Abstract: Police organisations frequently receive questioned documents that require examination for both the detection of latent impressions by ESDA (Electrostatic Detection Apparatus) and trace DNA.

Until recently there has been little information available to enable practitioners to make an informed decision as to which examination should be undertaken first. To determine the best sequence of examination of document exhibits through the various specialist departments, experimentation was undertaken with the specific aims of 1) determining the effect of the ESDA process on the recoverability of trace DNA from a document by tape lifting, and 2) determining the effect the tape lifting process had on the quality of the ESDA result.

The research results showed that it is extremely difficult to recover DNA from paper due to its porous nature. In some instances, it was possible to obtain DNA profiles after an ESDA examination had been conducted. Whilst rare, there were occasions when DNA transferred from the questioned document onto the underside of the Mylar film during the ESDA examination with partial DNA profiles obtainable. In all instances, the tape lifting caused damage to the paper's surface causing the visibility of the developed indentations to be diminished.

Jones, Kylie, Sarah Benson, and Claude Roux

Application of Isotope Ratio Mass Spectrometry for the Measurement and Comparison of Australian Office Papers

Abstract: In response to an identified capability gap in the forensic document examination discipline, a project to develop the analysis of document papers using isotope ratio mass spectrometry (IRMS) commenced in 2010. Results published to date have focused on carbon isotopes, including a background study of 80gsm office papers, an examination of the homogeneity to define the source level for this material, and an examination of the impact of office-type printing, fingerprint and DNA examinations on papers prior to isotopic abundance measurement. These experiments have now been conducted for oxygen isotopes, with the results to be discussed during this presentation.

The results of the technique will also be compared to the results obtained using traditional paper examination techniques including the physical measurements of grammage and sheet density.

As this research project nears completion, a holistic view of the operational value and discriminability of the technique to also be discussed and the current and future state for this technique's application for document paper examination presented.
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Jones, Kylie

The Australian and New Zealand Documents Specialists Advisory Group (Doc-SAG): Validation Project, Current Work and Future Priorities

**Abstract:** This presentation will discuss the current work being undertaken by the Australian and New Zealand Documents Specialists Advisory Group (Doc-SAG) including a large scale project designed to test the extent to which forensic document examiners can accurately undertake a range of tasks relevant to their discipline. This validation of examiner skills project includes a range of examination types such as the comparison of inks, the identification of printing processes and office machines, the comparison of stamp impressions and the decipherment of indentations.

In addition to the validation of examiner skills project, this presentation will also aim to provide an update of the SAG's other action items and priorities currently including the development of core competencies for document examiners, training and standards development.

Kruger, Diane

Examinations Involving Fax Confirmation Reports - Points to Consider

**Abstract:** Civil cases often involve the filing of affidavits attaching fax confirmation reports as proof of service. Document examiners may be called to examine documents relating to these affidavits in the event there is a dispute as to proper service. This paper sets out some of the practical considerations in conducting such examinations and discusses some of formatting styles and programming issues that document examiners should be aware of.
A New-Dominant Hand: Training the Non-Dominant Hand to Perform the Complex Task of Handwriting

Abstract: Use of the non-dominant hand is one method sometimes utilized to disguise one's handwriting. FDEs are always mindful of possible disguise in questioned and known handwriting when performing examinations, but it should be remembered that use of the non-dominant hand is not always used as a means of disguise. Sometimes, it is forced on a writer due to amputation, illness, immobility, or other factors. Consider, for a moment, veterans of the Iraq and Afghanistan wars. As of January 2007, there were 541 major limb amputations performed on US soldiers at two military hospitals alone. In the seven years of combat since that statistic, the injuries and amputations have continued.

So it was with our soldiers and wounded veterans in mind that this study began. Using a book called "Handwriting for Heroes," I embarked on a six-week process of training my non-dominant hand to perform the complex task of writing. The six-week project consisted of twelve daily writing assignments such as repetition of letter combinations, tracing cursive writing outlines, shading in objects with a pencil, and copying sentences. There was also a daily 'homework' assignment meant to increase dexterity and coordination. Specific problems and challenges encountered during the exercises were documented. Differences between the dominant-hand writing and non-dominant-hand writing were seen in: slant, letter designs, retracings, beginning strokes, connecting strokes, speed and fluency. Changes to the handwriting, which improved noticeably over the six weeks, were also documented.

Those who have lost the use of their dominant hand due to injury, illness, or amputation have no choice but to transform their non-dominant hand into their new dominant hand. If faced with samples of their writing, it must be understood that they are not necessarily attempting to disguise their writing, but perhaps just trying to survive and thrive. This exercise is meant to bring awareness to a growing source of handwriting that may appear to be disguised or distorted, to assist FDEs in understanding the process involved when training the new-dominant-hand, and to highlight certain features and characteristics that might be observed in the handwriting produced by the new-dominant-hand.
Lee, Jim


Abstract: Imaging of questioned document evidence has progressed from the use of the human eye to the analog camera to the digital camera to the use of the most sophisticated scientific instrumentation known to man, such as the use of video spectral analysis (VSA) instruments. Whether it be from documenting of faded handwriting to observing subtle ink differences, images available through a combination of modern day filtering and application of various light sources can depict more about the appearance of evidence, especially when those image results come from image enhancement utilizing various types of light, filter and wavelength variations to aid in enhancement and/or decipherment. The modern day questioned document examiner spends much of his or her time and effort making writing, typewriting, printing, alterations and obliterations visible or more visible using various image enhancement techniques with the related images. These techniques for enhancement require fundamental and practical knowledge in the enhancement of document evidence utilizing various light sources, optical filter techniques such as with the use of longpass, bandpass, long wave and short wave filtering methods and image capture devices, and their application, either individually or in combination for application in the examination of document evidence. This presentation will discuss the historical background of the adaptation, improvisation and/or innovation of various means and instrumentation used to optically enhance and capture document evidence.

Martire, Kristy

Lay Interpretations of the Association of Forensic Science Providers (AFSP) Verbal Conclusion Scale

Abstract: Verbal conclusion scales for communicating expert evaluative opinions are utilized in many forensic science disciplines. Up to this point the development of these scales has largely focused on their logical validity. In recent times this has led to a preference for conclusions expressed in the form of verbal and numerical likelihood ratios. While these considerations are valuable and worthy of attention, it is also important to explore how these conclusion scales are understood by legal decision makers including judges and jurors. Yet few psychometric principles have been consulted in the process of creating verbal scales and little empirical research has been conducted examining how lay people interpret them. This study presents the results of a membership function analysis of the AFSP scale against probability and odds distributions. Results show that although participants perceive the same hierarchy of evidence strength (i.e., order the verbal conclusions in the same way as the expert), they clearly perceive a different magnitude of evidence strength than was intended by the scale. Specifically, there is clear disagreement about what the labels, for example, "extremely strong support," actually means. This is particularly true for assessments against the odds distribution currently favored in many conclusion scales.
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Masson, Janet F.

Computer-Scored Test Answer Marks - How Individual Are They?

Abstract: Funding for schools is increasingly based on the results of standardized tests administered to the students. In administering these tests, many states and education-related organizations use computer-scored answer sheets. On these sheets, a writer indicates his or her answers by using a pencil to fill in printed circles or ovals. These marks are sometimes referred to as bubble marks or grid marks. The answer sheets are then graded or scored electronically.

Document examiners are sometimes asked to examine these kinds of answer sheets in order to determine whether they were each fully completed by one person or are completed by a particular student. Since the sheets typically contain handwriting other than the answer marks themselves, the opinion reached, if any, is often based on the evidence in the handwritten text. However, sometimes the answer marks themselves become the issue. They can often provide interesting evidence and may become the focus of the entire examination.

The questions to be studied in this project are (1) whether answer marks are individual, (2) what conditions need to exist in order to reach a meaningful opinion about these marks, and (3) how the marks should be examined.

Mazzella, Williams, Liv Cadola, Pierre Margot, and Raymond Marquis

Are Simple Signatures So Easy to Simulate?

Abstract: Is it possible to perfectly simulate a signature, in the particular and challenging case where the signature is simple? A set of signatures of six writers, considered to be simple on the basis of highlighted criteria, was sampled. These signatures were transferred to forgers requested to produce freehand simulations. Among these simulations, those capable of reproducing the features of the reference signatures were submitted for evaluation to forensic document experts through proficiency testing. The results suggest that there is no perfect simulation.

With the supplementary aim of assessing the influence of forger's skills on the results, forgers were selected from three distinct populations, which differ according to professional criteria. The results indicate some differences in graphical capabilities between individuals. However, no trend could be established regarding age, degrees, years of practice and time dedicated to the exercise. The findings show that simulation is made easier if a graphical compatibility exists between the forger's own writing and the signature to be reproduced. Moreover, a global difficulty to preserve proportions and slant as well as the shape of capital letters and initials has been noticed.
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Mazzella, Williams, Martin Faurbach

Paper Color and Size Analysis for Detection of Page Substitution

Abstract: Paper color and paper size are basic features helping to discriminate papers. However the use of systematic measurements of the color and the size has not been fully investigated in the domain of questioned documents. This research focus on the contribution of paper color and paper size to assist the forensic document examiner in alleged page substitution cases. Forty different brands of A4 papers were analyzed for this study. The measurement of the size was done with a flatbed scanner and the RGB color analysis with the PIAS II imaging system (qea). The following hypotheses have been tested:

a) Due to the production process the size of paper vary within a packet and that can be used in the context of page substitution

b) The color of the paper vary between different types of paper allowing the discrimination of different papers

Preliminary results showed the possibility to distinguish between sheets from different manufacturers according to their size and color and the possibility to observe a systematic and predictable variation in length and width from one sheet to the other. The proposed methodology is fast, simple and non destructive.

McKechnie, Bianca, Dr. Sani Muke

Inkjet Discrimination of Counterfeit Security Documents

Abstract: Inkjet printing is commonly used for the counterfeiting of security documents. It is important to determine if counterfeit documents are printed by the same or different inkjet inks to ascertain whether they are from the same production source or not. This work assesses the Video Spectral Comparator Spectrometer (VSCS) function as a method for discriminating documents produced using different inkjet printers made by various producers. VSCS was selected because it is a fast and non-destructive technique. Preliminary VSCS results highlight in the spectral reflectance characteristics of cyan, yellow and magenta inks from different printer brands. The results also show that variation in the amount of ink deposited onto the substrate surface via inkjet printing does not change the reflectance profile. These findings were also found to hold true for tests conducted on counterfeit documents where a mixture of colours are used. It is anticipated that VSCS would be a complimentary test to assist with other document examination techniques. Further research is continuing in this area to evaluate the method as a routine test to discriminate counterfeit security documents.
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Meng, Zhaoyang

Analyzing the Relative Age of Paper by Biotechnology

Abstract: The purpose of this research was to develop the method for determining relative age needed for the paper formation via the use of some biotechniques, and provide the new ways and ideas for the identification of questioned documents age. As a result, along with the time increment of paper formation, the level of reducing sugar in the paper elevated while the degree of its polymerization decreased. Meanwhile, the number of bacterial and mold colonies went up. In conclusion, the inspection and identification of different types of paper with varied relative age could be carried out using biotechnological methods such as cellulose enzymolysis, viscometric assays, and microbiological techniques.

Merlino, Mara L. and Tierra M. Freeman; Veronica Blas Dahir, Victoria Springer, Derek Hammond, Adrian Dyer, Bryan Found

Validity, Reliability, Accuracy, and Bias in Forensic Signature Identification

Abstract: We investigated basic issues of validity and reliability in signature comparison tasks, the relationship between training and experience and examiner's deployment of attentional resources and use of information available in a variety of signatures, and how much confirmation bias affects the decision making processes of FDEs and a comparison group of Lay participants. Eye-tracking and self-report results revealed high construct validity and high convergent validity for the formal index used by FDEs to evaluate the authenticity of handwriting. FDEs made more distinctions among the features, and reported that a greater variety of features carried high evidential weight.

FDEs made more accurate calls, but also a greater number of qualified calls. Inter-rater reliability among FDEs was higher, but the extent and kind of training, education, and experience was not related to the type and number of features FDEs extracted, the weight they assigned this information, or how much FDEs outperformed Lay participants. Information about the outcome of a prior examination may have influenced the extent of information extraction, the use of extracted information, and the amount of time spent by the FDE when making a comparison call. Confirmatory information increased decision confidence, and disconfirmatory information decreased decision confidence.
Identifying Hand Printing: A Study

Abstract: Last year the 7th District US Federal Court excluded FDE testimony regarding the identification of hand printing as a result of a Daubert challenge. The court cited a lack of supporting research which validates hand printing identification specifically. In partial response to the court's findings, the purpose of this research is to determine the FDE’s ability to identify block letter hand printing (ALL CAP). The virtual absence of lower case letters in this study reduces potential variation and individualizing characteristics available for identification purposes and mirrors block printing common to FDE casework.

The intention of the study is to provide similar evidence and procedures that are a part of normal bench work. It is also essential to provide enough case examples to provide meaningful data for analysis. Participants are provided with 25 questioned writings. Each is associated with three potential "suspects." Participants are asked to opine (on a nine-point scale) whether or not each suspect is the writer.

Study packets (CD edition) are being distributed at this meeting or are available by written request (forensicqde@gmail.com). Questionnaire packets are also available online. Individual participant answers are strictly confidential. Participants can request their personal results once all answer sheets have been submitted.

The Origin of a Tracing

Abstract: A case study regarding a life insurance document in which the beneficiary information was allegedly changed. The authenticity of the principle signature was in question. Examination revealed the signature was spurious and possibly a simulation or a tracing of a genuine signature. Search of the known writing revealed signatures that could have been used as a model for the questioned signature. This presentation gives details about the examination and results.

Examination of Digital "OneNote" Files

Abstract: This presentation details the examination of digital handwritten, "OneNote" files. An examination concerning child pornography was conducted of approximately 129 pieces of evidence, to include: laptops, cell phones, tablet PC's, hard drives, USB devices, memory cards, and videos. During the examination of the hardware and memory media, numerous handwritten "OneNote" files were detected containing references to child pornography. These "OneNote" files were used to obtain known writing from the suspect. A comparison of the questioned handwritten "OneNote" files to the known writing of the suspect resulted in a positive identification.
Pang, Chi-Ming, Janesse W.S. Hui and Chi-Keung LI

A Study of Various Factors Affecting Stamp Identification

Abstract: Stamp identification is performed by matching unique defects present on the stamp face with those on the impressions. Being the most significant criterion for stamp identification, the unique defects may be introduced onto the stamp face during its manufacturing process or usage. Apart from the defects, this paper explores other factors which are essential to derive a conclusion from the examination of stamp faces and impressions. These factors include shrinkage of stamp during normal use, effect of temperature and humidity on the shrinkage, re-inking of the stamp, effect of day light on the appearance of the impressions, the possibility of a duplicate stamp and the smudging effect. The paper also discusses the weight of these defects and factors in formulating opinions.

Payne, Jeffrey

The Thermal Ribbon Analysis Platform (TRAP)

Abstract: The Thermal Ribbon Analysis Platform (TRAP) was created to efficiently collect and save information from thermal print ribbons. Thermal printing is encountered in counterfeit identity and financial documents, therefore ribbons recovered at crime scenes may contain valuable evidence of such counterfeiting. Thermal ribbon information acquired by the TRAP can be associated with particular documents and suspects.

Before the development of the TRAP, thermal ribbons were manually scanned. Scanning, however, could require days. The TRAP automates scanning and recording of ribbon information. The TRAP does not modify or damage ribbons and is subject to calibration and/or validation procedures required by laboratory accrediting bodies.

The TRAP is fast and versatile. It can scan a typical thermal ribbon in less than two hours. It can scan thermal ribbons of various types, widths, colors and compositions and facilitates both automatic and manual recovery of latent data.

The TRAP processes images using its included software which contains image flipping, rotation, and inversion features. The TRAP software can also be used for manual histogram manipulations, batch operations, tagging, and OCR-generated text.

The TRAP was a collaborative development project between the United States Secret Service, the Technical Support Working Group (TSWG), and Quantum Signal, LLC.
Pfefferli, Peter

Why My Second Opinion Report is Superior to the Report Submitted by the Other Expert

Abstract: Providing a second or third expert report has become very frequent - showing an upwards trend. What is your strategy to do a job which is at least as good as the previous one, but hopefully even better? Why do you subjectively conclude that the information and the results given by the first expert do not meet your quality requirements? Will you at the end be offering a product which is considerably better or will you just improve your sales strategy? It is rather difficult to be objective when judging the quality of the work another expert has done. Looking through a number of handled cases, the paper will evaluate some of the critical questions which were often put forward by the parties; critical answers given to satisfy the requests and possible weak points in the quality of the product you want to beat.

Riley, Tom

Revisiting Digital Techniques for the Examination of Electrostatic Lifts

Abstract: The purpose of this research is to briefly demonstrate several digital examination techniques commonly used in the examination of electrostatic lifts. While this topic has been discussed and presented before, advances in technology warrant a revisit of this topic. Discussion of documentation for the digital imaging process to ensure reproducibility, along with image and setting preservation will be included.

The most important results engage the forensic document community in this presentation of simple, powerful digital tools available for the examination of electrostatic lifts, in conjunction with the examination of original lifts and any associated documents. The use of layers and enhancement techniques allow for the determination of the presence of impressions beyond visual examination capabilities.

The key results will be to provide examiners with knowledge regarding the use of these simple tools available to the forensic document examiner to allow for critical analysis of electrostatic lifts.
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Strach, Steven and Andrea Devlin; Claire Graydon

Determination of the Direction of Writing of Ballpoint Pen Ink Lines

Abstract: Determining the direction in which written lines have been executed is an important part of the work of the forensic document examiner. This information can be of key importance in the comparative examination of questioned and specimen signatures and handwriting and also in determining the presence of altered writings.

The purpose of this paper is to report on an initial assessment of the reliability of a documented method of determining ballpoint pen ink line directions by observing the preferential build-up of ink on the upstream side of paper fibres.

During 2013 and 2014 document examiners with several organisations in Australia took part in a blind trial. Each examiner was asked to determine the direction of writing of forty short, straight lines written with two black ink ballpoint pens. The samples were prepared so that other direction information was excluded. Participants provided an unqualified or qualified determination or an inconclusive result for each line. Examiners’ results were assessed to determine the overall reliability of the method. Factors that appear to allow a confident determination and factors that detract from making a determination are discussed.

Taylor, Melissa, Rigo Vargas, Gerry LaPorte

The Expert Working Group on Human Factors and Handwriting Analysis Process Map: Understanding the Process to Improve Practice

Abstract: Human error is an inevitable part of everyday life. In most instances the results of human error are harmless and correctable, but in circumstances, such as forensic analysis, where errors may lead to the loss of life or liberty, error prevention is imperative. Through the study of human factors, the forensic science community can assess the effects of human and organizational factors on the forensic analyses and gain a deeper understanding of when and why errors occur. The National Institute of Justice and the National Institute of Standards and Technology are sponsoring a series of expert panels to examine the effects human factors in forensic analyses and recommend practices to reduce the likelihood of error. The second working group in this series will focus on handwriting analysis. The first task the working group has taken on is to develop a process map that accurately depicts the analysis process and identifies critical decision points in the process. Understanding and documenting the steps in a process, their order and dependencies, and other critical pieces of information provides a common understanding of the entire process and helps to identify problem areas. Before you can improve a process, you must understand it. This presentation will include an overview of human factors, a description of the working group series, and present the forensic handwriting analysis process map developed by working group members.
Vastrick, Thomas (paper presented by Kevin Kulbacki)

**Frequency Occurrence in Handwriting and Hand Printing Characteristics - Preliminary Results**

**Abstract:** Even before the NAS Report, judges have viewed challenges to handwriting comparison admissibility with skepticism but have also chastised the profession for a general lack of statistical bases from which conclusions are based. The purpose of this research is to establish a base level of statistical data for particular use in court illustrating the statistical bases for our conclusions. This presentation will provide the most current frequency numbers available from the study and also address the many possible abuses of the research and statistical reliance in general to include the possible misuse of the product rule. This presentation will also provide a brief overview of the entire project. The key conclusions are the frequency ratios that will be provided for each of approximately 900 characteristics.

Welch, Todd, Mark A. Goff

**Enhancing Obliterations/Erasures Using Photoshop And A Wacom Graphics Tablet (illustration)**

**Abstract:** The Forensic Document Examiner is occasionally presented with a case wherein information has been obliterated and/or erased. The content of such obliterations/erasures can be important to recover and may provide significant probative value to the investigator. As software technology has evolved over the last two decades, a number of presentations/workshops have been made regarding different ways in which to enhance and recover information in these types of cases. One of the most common types of imaging software used by Forensic Document Examiners is Photoshop.

In addition, advancements in hardware technologies have also progressed especially in the area of graphics tablets. These tablets as opposed to a mouse have become more widely used due to the stylus based interface and the ability to detect pressure, tilt, and other attributes as it interacts with the tablet. This particular presentation will illustrate a technique using Photoshop software in conjunction with a Wacom Bamboo Tablet to enhance and recover obliterated/erased content.
Panel:

PANEL: “Conclusions…”: Signature and Handwriting Conclusion Terminology and Scales

Abstract: A current and global issue in our field is the topic of conclusion terminology and conclusion scales, particularly in respect of signature and handwriting conclusions. It is an important yet difficult topic to address because, while there is some commonality in the conclusion scales used in different geographical regions around the world, within a number of geographical regions there are multiple scales in use. It is for this very reason that it is also a topic in great need of discussion and there is a strong argument that we should attempt to reach a consensus (even if the result is that we agree to disagree).

This panel discussion is a collaboration of insights from numerous colleagues in our field in person, via Skype and in writing from private and government laboratories in geographical regions across the Americas, Australia, Asia, Africa, the Middle East and Europe.

Panelist lineup (in order of appearance):
Sandra Ramsey Lines (USA; private) – moderator and presenter of the introduction, “A Brief History of the Standardization of Handwriting Opinion Testimony”
Tom McAlexander (USA; retired govt) – in person
Ted Burkes (USA; govt) – in person
Rigo Vargas (USA; govt) – in person
Brent Ostrum (Canada; govt) – via Skype
Dr Audrey Giles and Robert Radley (UK; private, ex govt) – in person (collaboration)
John Welch (UK; private, ex govt) – via Skype
Anna Molin (Sweden; govt) – in person + poster
Wil Fagel (Netherlands; govt) – written only (paper introduced by Sandra)
Charles Berger (Netherlands; govt) – via Skype

--Break--
Dr Abdulaziz Al-Musa Alkahtani (Saudi Arabia; govt) – via Skype
Saqar Alzaabi (Oman; govt) – in person
Gideon Dabi (Nigeria; govt) – via Skype
Jannie Bester (South Africa; private) – via Skype
Linda Liu (China; govt) – in person, brief spoken input
Patrick Cheng (Hong Kong; private, ex govt) – written only (paper introduced by Sandra)
Chris Anderson (Aus; private, ex govt) – in person
Dr Steven Strach (Aus; private ex govt) – in person
Kylie Jones (Aus; govt) – in person
Workshops:

Cunningham, Lloyd and Linton Mohammed
WORKSHOP: Skillful Freehand Signature Simulation - Part 1

**Abstract:** There is no doubt that most simulated signatures we examine possess handwriting features that will likely expose the methodology used by the simulator while attempting such a daunting task. As professionals we should also be able to expand our detection of simulated signatures far beyond the amateur's version to the more sophisticated version executed by a skilled signature simulator. A segment of this workshop was designed to disseminate information about the handwriting characteristics in skilled simulated signatures that appear natural but are actually accomplished through the manipulation and control of the writing instrument, and to describe the numerous barriers encountered by the skilled simulator. The skilled simulator can bypass some of these barriers by utilizing the very features that occur in natural handwriting such as variation and accidentals to cover-up errors. Many of the distinctive features of simulation that are present in the usual freehand signature simulations may not be present in the skilled freehand signature simulations. Conversely, there may be features present in some questioned signatures that appear to be consistent with the act of simulation; however, they are actually anomalies in the line quality that were caused by certain writing instruments. To misinterpret the anomalies caused by writing instruments as evidence of simulation will prove to be a devastating error. There will be demonstrations, discussions and practical group exercises during this workshop which will concentrate on these subjects.

"Although the usual forgery is not a good piece of work it is well to know and to remember that there are adepts who can imitate certain classes of writing so well that no one can tell the imitation from the genuine." -- Albert S. Osborn

Penn II, John
WORKSHOP: Adobe, Digital Media & Evidence

**Abstract:** This course will cover digital media and document technologies. Topic will include: the role that differing software plays in the creation of digital document formats like PDF; the role of digital imaging software such as Photoshop in the creation and manipulation of digital documents and imagery; techniques for the discovery of digital manipulation - including “tool marks” left by various manipulation techniques. This talk will also go over the importance of building a relationship with industry - as industry can provide valuable resources and insight into the technologies they develop that have an impact on law enforcement, investigative and forensic work.

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The following is an OPTIONAL workshop that requires a separate $100 registration payment in order to participate (use the regular ASQDE registration form on the ASQDE website to register). Limited to 30.

**VSC Techniques Workshop (Friday, August 15 – 1:00 – 5:00 p.m.)**

Dave Tobin, Michael Zontini and Jim Lee of Foster + Freeman, will be an educational and practical experience for all VSC users, whether working in government labs or private practice. Practical sessions using various VSCs will provide live interactive demonstrations. Topics will range from basic comparisons to the more unusual applications for lights and filters.
2014 ASQDE Meeting Abstracts

Posters:

Abd Al Kader, Al Sharif Hashem Mohammed
Applications on Class Characteristics of Counterfeit Protection System Codes of Color Laser Copiers & Printers (case study)

Abstract: Widespread use of color laser printers and copiers made counterfeiting money & valuable documents an easier task than in the past. To prevent its fraudulent use, manufacturers use a counterfeit protection system code which prints barely visible yellow dots on the paper. These yellow dots contain encoded information such as the serial number of printers and copiers. In this paper we applied the methodology of Janis S. Tweedy for detecting printer class through which we can identify the manufacturer of the printer used (applied in case study Counterfeiting 200 EGP, 100 $). We used the Counterfeit Protection System code also to link the counterfeiting money to its exact source of issues in cases that contain standard computer, printing hardware & counterfeiting currency (applied in a case study).

Belliston, Iris A.
A Plastic Grocery Bag Helped Tell Her Story

Abstract: The morning of June 29, 2010 Carmen Placencia's body was found off the Interstate 210 freeway, wrapped in a plastic shower curtain, set on fire. Javier Nava was charged for murder based on several findings and forensic evidence. Among the evidence for this case, was a plastic grocery bag found in the subject's kitchen that bore the same manufacturing lot number as the one found wrapped around Placencia's head at the time her body was discovered.

This poster will demonstrate the recovery of the questioned bag's manufacturing lot number and its meaning regarding production according to the information provided by the distributor and the manufacturing plant companies.

Campbell, Timothy, Peeter Pajos, and Jacqueline Osmond
Unexpected Introduction of Tremor into Photocopied Handwriting

Abstract: A Xerox WorkCentre 7545 used routinely in a forensic document examination laboratory was found to, at times, produce a photocopy of evidentiary material that rendered the appearance of tremor in some portions of the handwriting present, whereas the document bearing the original handwriting exhibited none. Tremor is often associated with simulation or disguise, and is frequently used as a means of distinguishing naturally-written from unnaturally-written entries. The importance of such a finding is that not only do forensic document examiners use multifunction machines to reproduce evidence for note taking purposes, but they routinely examine submitted photocopies themselves when the original document cannot be supplied. This factor could potentially affect the degree of certainty of an authorship conclusion, or worse, if undetected, give way to an undesirable misleading conclusion. The authors made an attempt to characterize the alteration and to determine which circumstances might cause such an alteration to occur.
Conrad, Marianne

Study on the Variability vs. Consistency of Signatures and Handprinted Features on Transfer Orders

Abstract: Over a period of three months, 50 participants were asked to fill out a total of 30 German bank transfer orders with a specific text and to sign them habitually. The text was designed to include all letters of the alphabet as well as all numbers at least once. The selected bank transfer orders consisted of eight lines of small boxes, each designated for one letter or number. Subsequently, the writing style required hand printing or capital letters.

Regarding variability and consistency, the examination of these writings focused on letter size, structure, formations, class characteristics and individual features. Additionally, the signatures on the forms were assessed relating to their degree of congruence.

As the information that can be gathered by examining the samples covers a variety of different aspects of handwriting, the study will be ongoing for a period of time. This presentation will show the first part of the study's results.

Detwiler, Khody

A Picture is Worth a Thousand Words

Abstract: "A Picture is Worth a Thousand Words" - This adage has been used since the early 1900's, and although it may be somewhat dated, continues to hold true on a daily basis. When Forensic Document Examiners (FDEs) are called upon to examine evidence, either in the field or a laboratory setting, one of the most important steps is to appropriately image the submitted evidence. This particular step is not only crucial to the examination process, but it is also essential to the overall effectiveness of live testimony; should it be required. Obviously when FDEs testify in court they rely heavily upon demonstrative exhibits to assist the trier of fact in understanding the basis for their conclusion(s). As such, the images initially obtained are likely to provide the foundation for creating the framework of highly effective demonstrative exhibits. Although many FDEs have developed their own systems and methods for creating court charts; this examiner would like to share the process that his laboratory has been developing for several years to achieve this important task.

This presentation will identify and explain the various pieces of equipment and software used to create these Comparison Chart Illustrations; as well as provide several examples of finalized graphic illustrations utilizing this method.
Dumont, Jean C.

A Bit of History: 2014, the Centennial of the First Forensic Laboratory in North America.

Abstract: 1914-2014, a century of Forensic Sciences at the Laboratoire de Sciences judiciaires et de Medecine Legale in Montreal, Quebec, Canada. A short history of the oldest forensic lab in North America.

Elliott, Haley

The More Known Writing the Better, or Is It?

Abstract: When asked how much known writing Forensic Document Examiners would like for comparison to questioned handwriting, the answer is often, "the more known writing you can get, the better." Does this theory hold true, however, when a case involves a large volume of known writing from two individuals with similar handwriting for comparison to a questioned document. The purpose of this study was to test this theory and determine if a trained examiner could come to the correct conclusion when presented with this type of case. Practical exercises were created with a questioned document and sets of known exemplars provided to the examiner over a period of time.

Holt, Melanie

Laser Reveals Hidden Information on Envelope Window

Abstract: In a stalking matter, the victim received a series of anonymous threatening letters in envelopes recycled from major Australian organisations such as banks and insurance companies. One particular letter was sent in a recycled glossy, window face envelope from the insurance company, AAMI. The envelope was received into the Document Examination Section (DES) of the NSW Police Force torn into pieces and during the reconstruction it was observed that toner, presumably from the original letter, had transferred onto the inside of the envelope. It was hypothesised that if the identity of the original recipient could be revealed, it could provide vital information leading to the identification of the offender. Unfortunately not all of the pieces were recovered and the area containing the recipient's identifying information was missing.

During the examination toner remnants were also observed on the window face of the envelope, however these were not legible as letters or numbers to the naked eye. Initial examinations to enhance the toner remnants on the window face were undertaken using the Video Spectral Comparator (VSC) with no success. With the assistance of the NSWPFE Evidence Recovery Unit (ERU), using a high powered 532nm TracER laser and an orange filter, it was possible to visualise the information contained on the window face. This, in collaboration with other investigative leads, helped to identify a suspect who subsequently pled guilty to a number of offences when faced with the evidence.
Huang, Jiantong

Application of Resistance Measurement Examination in the Forensic Study of Questioned Documents Involving Changed Handwriting Written by Black Gel Pen

Abstract: Using changed handwriting written by black gel ink to perpetrate forgery and alteration of documents are becoming increasingly more sophisticated in China. Forensic examinations of questioned documents routinely involve physical and chemical analysis of inks. This work provides a non-destructive, convenient, and effective testing method to identify the added or altered handwriting by black gel ink. The inspection process is conducted by resistance measurement examination. With the advantages of the convenient preparation of samples, easy and fast operation of instrument measurement, it provides the abilities for detection and identification of the changed handwriting by black gel ink.

Lawder, Diane, Jennifer Robinson and Ashley Chapman

The Effectiveness of Using Solvents to Remove White-Out on Different Inks

Abstract: This research project came about after a document examination case involving "white-out" was submitted. The request was to view writing underneath the "white-out" or remove the "white-out" without causing destruction to the ink. At the time, my laboratory had a VSC 1. Although still functional, it did not have the advanced features of a newer instrument such as the VSC 5000. This request required additional help, which prompted the following research project. Correctional fluids commonly known as "White-Out," were used on various types of paper substrates and on various inks and pencil. Several different solvents were used in an attempt to remove the different correctional fluids without causing the ink underneath to run or causing destruction to the substrate.

Xylene was found to be the most accurate and successful solvent when used to remove the correctional fluid from the various substrates without allowing the ink underneath to run. Testing revealed the most successful solvent that would not cause the ink to run, is Xylene with a 60% success rate. Other solvents used had significantly lower effectiveness.

Lin, Hong, Qingbo Meng

Dating Documents Based on the Variations of Stamp Impressions

Abstract: The stamp impressions show some variations which are caused by the wear of or various attachments on a seal surface as time passes. Therefore, based on the variations of the stamp impressions, the dates when the stamp impressions were imprinted on suspicious files can be determined. This paper sums up the characteristics of the seal surface wear and various attachments of plastic seals on account of case study. Macroscopic and microscopic comparisons were addressed in this paper for dating the suspect stamp impressions. A document is considered as a forgery if the date of stamp impression is inconsistent with the dateline of the document. Two cases illustrated in the final part of this paper, in which the methodologies were applied, are the favorable examples.
Liu, Linda (Ning)

An Experimental Study of Visualizing the Trains of Star Wheel Marks on Inkjet-printed Documents

Abstract: Star wheel mark, a valuable feature of inkjet printer, refers to the trains of punctate indentation left on a document printed by an inkjet printer. Using a microscope with oblique lighting, one can observe several indented dots in line(s) with the same interval. However, the small field of view limits the analysis of star wheel mark trains, which might represent the individuality of this feature. In this study, the author tried a few methods with the devices available in our lab to visualize the trains of star wheel mark over the A4 pages of printouts. These devices included a digital camera, a Crime-Lite® 82L, an electrostatic detection device (EED), and a film scanner. Three kinds of substrate (plain paper, inkjet paper, and photo paper) were printed on by 22 inkjet printers. Then, with the devices, several methods of extracting the feature on the different substrates were conducted. It was found that the trains of the mark on photo paper could be easily extracted via scanning in transmitted light mode; while with the aid of an EDD, the best results of revealing this feature on plain paper were obtained with Crime-Lite® 82L or developed with dry-erase marker ink.

Payne, Jeffrey

Hudson County Homicide - Disguised Writing?

Abstract: The United States Secret Service's Forensic Services Division received a request from New Jersey's Hudson County Prosecutor's Office regarding the trial of State vs. Shiquan Bellamy. The evidence included a questioned handwritten letter and envelope to be compared to request writing obtained from Mr. Bellamy. The questioned letter and envelope was received by Mr. Bellamy's girlfriend during the time period he was in jail for the murder of two individuals. In the letter, the girlfriend was directed to kill the co-defendants in the case. The comparison writing obtained from Mr. Bellamy did repeat the questioned material, both in cursive and in hand printing. There were also three additional pages repeating the material found on the envelope. After first cursory glance, (pictorially) it did not look like the same writer. However, after a thorough examination of the specimen writing it was determined that the author was attempting to disguise his handwriting specimens. After a comparison it was determined that the author of the specimen writing very probably wrote the questioned letter.

Rottes, Tanja, and Rolf Fauser

New Developments in Inkjet Landscape Printers

Abstract: Recent advances in inkjet printing technology have especially benefitted printers with immobile print heads. Their advantage can be seen not only in the gain of printing speed but also in regard to sustainability and minimizing of printing costs. This poster will show print characteristics that may be used for classification of some of the printer models that have recently been introduced on the market.
Singer, Kirsten

Does Handwriting Change Over Time?

Abstract: One of the basic premises of forensic handwriting analysis is that an individual's handwriting gradually changes over time. This is the rationale for requesting known writing that is contemporaneous with the questioned writing. While the premise of handwriting change is certainly evident to varying degrees, it is not known how reliably, and to what degree, change occurs.

At the Department of Veterans Affairs (VA) OIG Forensic Document Laboratory, one of the more common handwriting examinations involves the examination of a questioned signature on VA Government Beneficiary forms. The known writing submitted to the laboratory for comparison usually consists of signatures collected by the VA over decades. The purpose of this research is to determine the consistency of the premise of changing handwriting by examining samples of approximately 200 veterans' signatures that have been collected over time by the Department of Veterans Affairs (VA).

This research is currently in its preliminary stages, and to date is based on the handwriting of approximately 20 veterans. Any potential conclusion(s) that can be reached will be provided at the time of presentation. The handwriting of veterans who have suffered obvious trauma that would affect their handwriting (e.g. hand/arm surgery, significant visual loss) will not be considered.

Tytell, Peter

Characters Sans Borders

Abstract: The QD Sans Borders theme of this year's meeting noting "that the forensic document examiner community has no borders" reflects not just the growing globalization of our community, but also the nature of contemporary society and the documents that might be submitted for examination. While previous generations of North American document examiners were well aware of the writing habits that the great waves of immigration brought to our shores, today's examiners can be confronted with documents from any part of the planet in languages that use characters not seen in English language texts.

This presentation will seek to familiarize examiners with internationally accepted naming conventions for diacritics and for accented characters used in Latin based alphabets as well as with illustrated on-line resources to help find the correct name of a character for the examiner to use in a report or a court. These resources also cover a wide range of characters in non Latin alphabets and other writing systems.

Suggestions will also be provided on recognizing certain languages or linguistic groups based on the presence of specific characters or groups of characters.
2014 ASQDE Meeting Abstracts

Papers Submitted for Digital Compilation Only:

Cheng, Patrick Yau-Sang

An Overview of Radicals in Chinese Characters Part III - An Investigation Into the Possible Influence of the Position of a Radical in a Character to its Writing Movement

Abstract: This is the third paper of a series of papers titled "An Overview of Radicals in Chinese Characters". The first paper titled "An Overview of Radicals in Chinese Characters" detailing the 214 different radicals in Chinese characters was circulated in the 2010 ASQDE Conference. The second paper titled "An Overview of Radicals in Chinese Characters Part II - A study on the writing of radicals of similar structures" was circulated in the 2011 ASQDE Conference. In the second paper, it was found that the position of a radical may have effect on the writing movement of a radical.

The present paper aims to investigate the relationship between the position of a radical in a character and its writing movement. The findings show that the position of a radical could affect the size of the radical, that is, the height and width of the radical, as well as the length of certain strokes in the radical. For the latter, the middle horizontal stroke, the prominent horizontal stroke, the prominent sabre stroke or the ending sabre stroke would be affected. The tendency, in general, of the height and width of radicals in different positions is also discussed. The writing movement of a radical would largely be unaffected by its position in a character. This paper also provides some statistical data for the radicals under study.

Yang, Chiew Yung

A Preliminary Study on the Handwriting of Adolescents in Singapore

Abstract: The handwriting of adolescents is an interesting and challenging topic as according to literature, adolescence is the period when numerous and pronounced changes usually occur in the handwriting of the average writer before maturing and becoming stabilized in adulthood. Although a number of similar or related studies have been conducted in the past, most of these pertain to handwriting in the United States and such research is limited in Asia. Since the way handwriting is being taught can vary significantly across populations, the resultant writing styles and prominent characteristics of the local population are likely to be different from those previously reported. This preliminary study on 60 students in Secondary 1 (equivalent to the Seventh Grade in the United States) aims to provide such information in the local context, which can be expanded to include more students in future work. The results are then compared with those reported previously. It is shown that there are a number of differences in the writing styles and characteristics of adolescents between the current and previous studies.