2023 ASQDE CONFERENCE ABSTRACTS

WORKSHOPS

Kalantzis, Nikolaos

Title: DCS visualizations: …from numbers to images… to numbers again!

Abstract: A Digitally Captured Signature is a collection of numbers, created during the digitization of the physical parameters of the act of signing. These numbers are usually converted to images – in various forms – for the benefit of the human user (expert or otherwise) as our brains are in no position to comprehend them in their original form. These images can be used to highlight different aspects of the handwritten motion – sometimes more accurately than the tradition trace on the paper – but they can be misleading as well. In this workshop, the participants will be acquainted with the most common (and some a bit uncommon) visualizations of biometric data; they will appreciate their strength and weaknesses and will have a hands-on experience with the processes of both purpose specific DCS analysis software but also generic representation software. Even though no coding experience is needed & coding is not required as part of the workshop, the participants will have the opportunity to understand the relation between the numerical data, the visualizations, and the executed & subsequently captured motion of signing by looking into the code of R and Python. The participants are encouraged to bring magnifying instruments with them (for appreciation dynamic features as speed of execution, pressure etc. on paper samples). The participants are also encouraged to bring Windows laptops (or MacOS with Windows virtual machines) to be able to collect and process samples. The participants will have to install the DEMO version of Namirial's FirmaCertaForensic analysis software and will be given a set of digital files. This can take place beforehand but also during the workshop. The participants may also install R Studio and Python programming languages (wither MacOS or Windows latpotp) as examples of the code will be given.

Bio of Presenter: Nikolaos (Niko) Kalantzis has a BSc in Physics, a PgD in Forensic Science & an MSc in Questioned Documents and a he holds a diploma in Questioned Documents (FSSocDip) from the Chartered Society of Forensic Science of which he is a Professional Member. He works both for the courts of Athens and Piraeus and handles private cases as an examiner and manager of Chartoularios Institute, an associate member of the European Network of Forensic Handwriting Experts (ENFHEX), and is registered in the list of experts of the International Criminal Court at the Hague.Niko served as Visiting Research Fellow from 2008 and since 2018 is a researcher with Staffordshire University, participating in experiments and research projects as well as delivering lectures at undergraduate and postgraduate levels.

WORKSHOPS (continued)

Kalantzis, Nikolaos

Title: Taking advantage of DCS technology & applying it to pen & paper casework.

Abstract: The vast deployment of biometric signature solutions (a.k.a. Digitally Captured Signatures – DCS) has led to the investment and subsequent development of advanced hardware solutions that allow the accurate digitizing of the handwritten movement. Furthermore, with the development of Electromagnetic Resonance (EMR) technology digitizers, the industry is in a position to construct inking pens that also capture accurate digital information – and it does. These solutions can be utilized to collect handwriting and signature samples, revealing the fine characteristics of the handwritten movement in a more quantifiable and approachable manner, assisting the QDE.

In this workshop the attendees will be introduced in the technology behind hybrid sample collection; the sample collection procedure will be discussed and assessed on a hands-on approach, and evaluation of both physical and digital versions of the same signature sample will take place.

Bio of Presenter: Nikolaos (Niko) Kalantzis has a BSc in Physics, a PgD in Forensic Science & an MSc in Questioned Documents and a he holds a diploma in Questioned Documents (FSSocDip) from the Chartered Society of Forensic Science of which he is a Professional Member. He works both for the courts of Athens and Piraeus and handles private cases as an examiner and manager of Chartoularios Institute, an associate member of the European Network of Forensic Handwriting Experts (ENFHEX), and is registered in the list of experts of the International Criminal Court at the Hague.Niko served as Visiting Research Fellow from 2008 and since 2018 is a researcher with Staffordshire University, participating in experiments and research projects as well as delivering lectures at undergraduate and postgraduate levels.

2023 ASQDE CONFERENCE ABSTRACTS

WORKSHOP FOR TRAINEES/JUNIOR EXAMINERS

Kulbacki, Kevin

Title: Navigating the Gray Zone: Challenging Testimony and Ethics Issues for New Examiners

Abstract: This workshop is specifically designed for new examiners who aim to enhance their ethical competence and effectively navigate the intricate nuances of providing testimony with integrity, especially when faced with difficult lines of questioning or ethical challenges. Testifying as an expert requires not only technical expertise but also a profound understanding of ethical considerations when confronted with dilemmas that may arise. The primary objective of this workshop is to equip new examiners with the necessary knowledge and skills to confidently navigate the gray areas they may encounter throughout their careers. By engaging in real-life case studies, interactive discussions, and practical guidance, participants will gain valuable insights into the multifaceted nature of ethical challenges and the complexities of handling difficult lines of questioning. The workshop will cover key topics such as the delicate balance between professional duties and personal beliefs, effective management of conflicts of interest, and the acceptance and mitigation of bias on testimony. Additionally, participants will explore various strategies aimed at maintaining credibility and impartiality while upholding ethical standards. By the conclusion of this workshop, participants will have developed a comprehensive understanding of the intricate nature of challenging testimony and ethical issues. They will be equipped with practical tools and frameworks that will effectively guide their decision-making processes, ensuring that their testimony remains reliable, credible, and ethically sound.

Bio of Presenter: Kevin Kulbacki is a Forensic Document Examiner and the CEO of KDX Forensic Consulting, having previously served as a Forensic Document Examiner for both state and federal law enforcement agencies. Kevin has his Bachelor's and Master's degrees in Forensic Science and is certified as a Diplomate of the American Board of Forensic Document Examiners. Kevin is actively involved in Standards Development as a member of the OSAC Forensic Document Examination Subcommittee and as the Chairman of the ASB's Forensic Document Examination Consensus Body.

2023 ASQDE CONFERENCE ABSTRACTS

PRESENTATIONS

Ambrosius, Teresa, Kevin Kulbacki, Karen Reczek, Agnes Winokur, Marc LeBeau, Allison Getz

Title: Highly Effective Standards Development

Abstract: The 2009 NAS Report, Strengthening Forensic Science in the United States: A Path Forward, summarized the challenges facing the forensic science community and emphasized the need for standardization. Administered by the National Institute of Standards and Technology (NIST), the Organization of Scientific Area Committees (OSAC) for Forensic Science was created in 2014 to address the need for discipline-specific forensic science standards.

OSAC fills this gap by drafting proposed standards and sending them to standards developing organizations (SDOs), which further develop and publish them (e.g., ASB, ASTM International, ADA, NFPA, and AES). Standards need to be fit-for-purpose to meet a customer's needs as well as support broad adoption and use.

The primary driver for the use of forensic science standards is public welfare and safety. The primary users are the forensic science community and the legal and criminal justice systems. Forensic results can sometimes be misinterpreted or misapplied. Standards that are specific, well-written, and to which personnel are trained, can aid in decreasing errors. Good quality standards have a positive impact on the quality of results produced.

The standards development process starts with stakeholders identifying a concept for a standard. The initiating stakeholders (such as OSAC) may develop a draft "seed" document that attempts to describe the specific need for the standard. After the concept has been accepted, experts within a subgroup or working group will begin to draft the standard. The draft is then circulated for comment, voting, and editing to allow stakeholders the opportunity to provide additional or clarifying language. After the comments have been addressed and the final draft is complete, the standard may move to a higher-level working group for additional voting and editing. Finally, the standard receives final approval and is published.

Once published, standards must be continuously reviewed and maintained. Different SDOs have different procedures in place. Understanding each SDO's standard types, processes and structure is important to success. Anyone who may be impacted by a standard or who has relevant technical knowledge to inform its development can get involved in standards development. According to OMB Circular A-119, a voluntary consensus standards development process is based on the following five principles: openness, balance, due process, an appeals process, and consensus.

Developing high-quality, scientifically sound standards is a long and sometimes contentious process. It involves bringing together various stakeholders with different backgrounds,

experiences, and perspectives to reach consensus on a given topic. To be successful, stakeholders must be able to lead themselves, influence, engage and collaborate with others.

Bios of Presenters:

Teresa Ambrosius is the Secretariat of the ASB, she started with the ASB in January 2016 as the Technical Coordinator and was promoted to Secretariat in December 2017. She manages the 13 consensus bodies and, along with staff, over 100 document working groups developing standards, technical reports, and other output, ensuring that all documentation is ANSI compliant. Ms. Ambrosius came to ASB from API where she spent nearly 20 years, primarily as Editorial Coordinator of Standards. She is a member of the ANSI Organization Member Forum (OMF) and the ANSI Board of Standard Review (BSR). In 2014 she was awarded the SES/CSA Lorne K. Wagner Memorial Award, which recognizes an SES member who has made an outstanding contribution to SES.

Kevin Kulbacki is a Forensic Document Examiner and the CEO of KDX Forensic Consulting, having previously served as a Forensic Document Examiner for both state and federal law enforcement agencies. Kevin has his Bachelor's and Master's degrees in Forensic Science and is certified as a Diplomate of the American Board of Forensic Document Examiners. Kevin is actively involved in Standards Development as a member of the OSAC Forensic Document Examination Subcommittee and as the Chairman of the ASB's Forensic Document Examination Consensus Body.

2023 ASQDE CONFERENCE ABSTRACTS

Angel, Miriam **(presented by Bethany Muro)**

Title: Signature Complexity and Examination Limitations

Abstract: The FDE's assessment of handwriting complexity is crucial in giving opinions on whether two samples of writing are by the same person or by different people. Even if two samples are similar in every respect, the writing may be so simple that it is easily simulated or that other people may naturally have the same combination of handwriting characteristics present in the samples. Research has shown that authorship opinions on comparisons with low-complexity signatures are not as accurate as those with higher complexity. As such, low-complexity writing is a limitation that should result in a more conservative authorship opinion. In this presentation, we will show some comparison results from a signature complexity study on which FDEs gave opinions on the 9-point SWGDOC scale, along with a combined forced-call opinion and confidence level. Aside from inclusion of low complexity signatures, there were other limiting factors in the comparisons, such as few known signatures and an inability to magnify the writing sufficiently to assess the full details of the writing. For low complexity signatures, higher error rates were expected for forced-call opinions, but it was also expected that opinions on the SWGDOC scale would be inconclusive or weak to account for the limitation in complexity and other factors. Instead, several examiners gave very strong opinions on the SWGDOC scale. Comparisons with low complexity questioned signatures where a wide range of opinions were given will be highlighted in this presentation.

Bio of Presenter: LAPD FDE trainee Bethany Muro is presenting this paper on behalf of Miriam Angel, who is unable to attend. Miriam Angel received a bachelor of science degree in applied mathematics from UCLA and a master of science degree in computer science from the USC. She completed her training at the Los Angeles Police Department in 1996 and continues to work as a forensic document examiner in the LAPD laboratory. Ms. Angel is a Diplomate of the ABFDE and is currently serving on the ABFDE Board of Directors and the Forensic Document Examination Subcommittee of OSAC. She is a member of the ASQDE and the AAFS.

2023 ASQDE CONFERENCE ABSTRACTS

Arès, Mathieu, Cyril Muehlethaler & François Nougarou

Title: HDsEMG for Handwriting Analysis

Abstract: Handwriting analysis utilizing forearm muscle activity signals is an emerging forensic science technique that aims to establish a connection between an individual's handwriting and electromyographic (EMG) signals generated by the muscles in their forearm during the writing process. This approach capitalizes on the distinct EMG signature that is unique to each person, shaped by the specific muscle movements employed in writing. In our study, we concentrate on exploring the potential and limitations of analyzing such traces. To achieve this, we will invite multiple participants to perform diverse writing tasks in various positions. Leveraging artificial intelligence methodologies, we conducted real-time evaluations to assess the accuracy of our models for different people. This will enable us to conduct a comparative analysis, assigning a certain level of probative value to link the handwriting samples with specific individuals and positions. The data derived from this analysis serves as a valuable resource for handwriting analysis. Moreover, this technique provides an avenue for reinforcing the notion that the observed variability in handwriting is a result of individual muscular patterns formed during the writing process, further strengthening the foundation of the postulates.

Bio of Presenter: Mathieu Arès is a master’s student in forensic science at Université du Québec à Trois-Rivières. He graduated in 2021 with a bachelor’s degree in chemistry with a specialization in forensic from the Université du Québec à Trois-Rivières. His research projects revolve around several subjects, including the analysis and interpretation of toxicological intervals, fingerprint distortion and falsification, and the analysis of handwriting based on biosignals.

2023 ASQDE CONFERENCE ABSTRACTS

Chandhakant, Siriphon

Title: A Comparison of Indented Writing Impressions and Non-glossy Paper Examined by Electrostatic Detection and Gelatin Lifters

Abstract: When writing happen on top sheet of paper, it left not only ink but also indented writing impressions on the underlying documents. These are called latent indented writing impressions. Examination of documents for latent indented writing impressions is important for deciphering in forensic science. Various methods can recover indented impressions. Each method has different limitations. Thus, this research aimed to compare the superiority between electrostatic detection device (EDD) and gelatin lifters to detect indented impressions on non-glossy and glossy papers at different paper basis weights. Indented writing impressions on the first sheet beneath the original document were studied in this study. Non-glossy and glossy papers had the paper basis weight 120, 180, 200, and 230 g/m2. Each sample was used to prepare 60 sheets, from 6 volunteers. The volunteer was gived 10 sheets. The volunteers wrote indented impression on a sheet of white pad paper 80 g/m2 using a ballpoint pen 0.5 mm, which non-glossy or glossy paper was put in bottom. All sample indented writing impressions were examined using EDD and gelatin lifters. The results of this research showed that EDD results showed higher %legibility of indented writing than gelatin lifters on non-glossy papers in every paper basis weight significantly (p-value <0.001). Gelatin lifters results demonstrated higher %legibility of indented writing than EDD on glossy paper in every basis weight significantly (p-value <0.001). Moreover, when comparing differences of different paper basis weight, it was revealed that different paper basis weight showed that no significant difference for recovering indented impressions on non-glossy and glossy papers when using EDD and gelatin lifters. However, the results from this research would be useful for selecting the method/technique that can detect when examining indented writing impressions using a type of paper which save costs for verification Keyword: Forensic document examinations (FDEs), Indented writing impressions, Electrostatic detection device (EDD), Gelatin lifters

Bio of Presenter: Pol.Col.Siriophon Chandhakant is a Forensic Document Examiner at central Police Forensic Science , Royal Thai Police. She earned a Master Degree of science in Chemistry from Chulalongkorn University, Bangkok, Thailand. She work as a Forensic Document Examiner since 2002.

2023 ASQDE CONFERENCE ABSTRACTS

Chen, Yung-Fou, Hsiu-Ling Chang, Chien-Tung Chen and Yun-Chih Chang

Title: Distinguishing Forged Traditional Chinese Signatures using Qualitative and Quantitative Methods

Abstract: This study investigates the features of genuine and forged signatures and proposes an identification process that can quickly distinguish them. Signatures are widely used as a symbol of personal identification in various domains, such as banking, insurance, and legal contracts. However, signature forgery is a common offense that violates the Criminal Code of the Republic of China (Taiwan). The problem of signature forgery is not only a legal issue, but also a social and psychological one, as it involves deception, trust, and identity. Therefore, it is important to develop reliable and efficient methods to identify forged signatures and prevent fraud. To analyze the qualitative and quantitative features of signatures, the author's signature was used as a model and 40 writers were asked to imitate it. The signatures were then examined visually and with the help of an image processing program called ImageJ. The program was used to measure length, angle, and other features of the signatures. The study compared 31 features of the forged signatures with the model signature and also checked their frequency in the genuine signature samples. The results showed that some features were more likely to be imitated than others, and that some features could be used as indicators of forgery. Based on these findings, the study developed an identification process that does not require complex instruments and can be easily applied by handwriting examiners. The study also discussed the limitations and implications of this research for future studies. This research differs from previous handwriting identification research in that it digitizes the stability of signature features. Instead of using arrows to mark features, this research uses the image processing program "ImageJ" to zoom in, measure length, angle, and other attributes to assist in sample analysis. The goal of this research is to identify the features that can be used to quickly identify handwriting signatures without the need for complex instruments. The results of this research also demonstrate that handwriting signature identification can be performed even if there is no original document to compare it to.

Bio of Presenter: Yung-fou (Chris) Chen, Ph.D., is an Associate Professor in the Forensic Science Department at Central Police University in Taiwan. He obtained his doctoral degree in Chemistry from the Graduate Center of the City University of New York (CUNY) and has been performing questioned document examination since 2009. Chris is a member of professional organizations including the Taiwan Academy of Forensic Science (currently serving as Advisor), the Taiwan Academy of Forensic Questioned Examination, and the American Society of Trace Evidence Examiners.

2023 ASQDE CONFERENCE ABSTRACTS

Choi, Jin Woo, Mi Jung Choi

Title: Complexity and Mathematical application of Northeast Asian Characters (Korean)

Abstract: The characters in Northeast Asia (Korean, Japanese, and Chinese) have different characters but have a common character space. This character space shares called an Imaginary Square Frame (ISF). The complexity of Northeast Asian characters felt by English users or FDEs is due to a two-dimensional arrangement in a limited space called an ISF, distinguished from English in a one-dimensional arrangement. This study identified the spin movement of the stroke in the ISF and explored how the handwriting characteristics in the structure of the two-dimensional array can be mathematically represented. Mathematical tools such as Matrices were handwriting forms or individuality through simple classification in the clockwise and counterclockwise directions. The mathematical indication is a rule that anyone can understand and solve the difficulties caused by the complexity of the character structure. In this study, the meaning of spin movement is to secure scientific universality. At the same time, it can be that a bridgehead study applies previous studies related to English handwriting analysis to Korean. In this presentation, you can check a general achievement that organizes the elements of Korean and English handwriting analysis. These findings will help expert testimony and handwriting analysis in Northeast Asian courts.

Bio of Presenter: Jin Woo Choi, As a senior researcher at the National University of Daejeon(CNU), South Korea, trains students and Law enforcement personnel. It also focuses on the scientificization of Forensic Document Examination through national research tasks.

2023 ASQDE CONFERENCE ABSTRACTS

Eisenhart, Linda and Peter **Belcastro**

Title: An In-depth Review of the Error Rates Reported in the Handwriting Black Box Study

Abstract: This presentation will take an in-depth look at the error rate results of the Handwriting Black Box Study that was published in the Proceedings of the National Academy of Sciences in August of 2022. The purpose of this presentation is to provide attendees with a better understanding of the study design, error rate results and how to accurately convey those results. Discussion of the study design will include varying assignment of QKsets to participants, mated and nonmated QKsets, the various datasets used to calculate rates (baseline, repeatability, and examiner comparison datasets), definitions of terms (e.g., false positive, false negative, true positive, true negative, etc.), and how error and accuracy rates were calculated. A methodical review and presentation of the data will be provided to walk through how each rate is calculated. In addition, a review of how error rates are affected by variables related to the examiner and the QKset will also be discussed.

Bios of Presenters:

Linda Eisenhart is a Forensic Document Examiner with the FBI Laboratory's Questioned Document Unit. She earned her Bachelor of Science degree in Chemistry from the University of Pittsburgh, her MBA from DeVry University, and completed the FBI Laboratory's 2-year full time training program to be a forensic examiner in 2015. Linda is the program manager for research within the Questioned Documents Unit and is focused on identifying and filling gaps in current knowledge base and foundational research; innovation of methods and techniques to achieve greater accuracy, objectivity and efficiency; and improving the reporting of results to contributors.

Peter Belcastro is a Forensic Document Examiner with the FBI Laboratory's Questioned Documents Unit (QDU). He has been conducting forensic casework in the field of questioned documents for more than 20 years and has testified to his results in various federal, state, and international courts. Mr. Belcastro is the Technical Operations Program Manager for the QDU and serve as Technical Leader for the Unit. He earned a Bachelor of Science degree from the University of Maryland in general biological sciences with an emphasis in microbiology and carries a Master of Forensic Sciences degree from The George Washington University. He is currently a distinguished member of the Mid-Atlantic Association of Forensic Scientists (MAAFS) and a regular member of the Midwestern Association of Forensic Scientists (MAFS).

2023 ASQDE CONFERENCE ABSTRACTS

Elliott, Haley, Lisa Tolli, Stephanie Kingsbury, Patricia Manzolillo

Title: Fraud and USPS: A Focus on Stamps

Abstract: The US Postal Service (USPS) has issued postage stamps since 1847. Most individuals think of the Forever postage stamps used to mail a First-Class letter, currently valued at $0.63, but stamps are available for a variety of amounts ranging from $0.01 to $26.00. Due to their monetary value, stamps have increasingly become a target for counterfeiting and fraud. Over the past few decades, there has been a shift in the type of fraud cases involving stamps investigated by the US Postal Inspection Service (USPIS). Previously, cases involved stolen or washed genuine stamp stock. Due to advances in technology, there is an increase in counterfeit stamps. With the increase in online shopping, consumers are purchasing stamps from large online vendors, especially when sales are advertised. Unfortunately, many of those purchased are counterfeit stamps. For the Forensic Document Examiners of the USPIS, a reference collection, intimate knowledge of security features, and ongoing training are essential to successful resolution of these cases. This presentation will provide a brief history of the stamp fraud and show the quality of the counterfeit stamps available on the market today. Best practices in conducting both visual and instrumental examinations will also be discussed. A variety of examples of genuine and counterfeit stamps will be reviewed. Stamp security features will be discussed, to include the printing processes, microtext, and the addition of an ultraviolet-reactive taggant. By requiring genuine stamps to be designed and printed by high-end commercial means with laying of security features, the counterfeiter has a more difficult time in procuring this equipment to replicate the stamp successfully.

Bio of Presenter: Haley Elliott is the Assistant Laboratory Director of the United States Postal Inspection Service Forensic Laboratory Services. She has a Master of Forensic Science from George Washington University. Haley is a member of ASQDE, and the Questioned Document Section of AAFS.

2023 ASQDE CONFERENCE ABSTRACTS

Fisher, David

Title: Innovative Approaches in Forensic Science Education: NJIT's Forensic Science Program Unveiled

Abstract: The Forensic Science Program at the New Jersey Institute of Technology (NJIT) provides students with strong foundational knowledge in biology, chemistry, physics, and mathematics, as well as mastery of forensic field practices and laboratory procedures. The comprehensive curriculum encompasses theoretical knowledge, practical skills, and ethical considerations, that equips students with the necessary expertise to excel as analysts in a variety of forensic disciplines. The program's commitment to excellence and its emphasis on interdisciplinary collaboration make it a valuable asset in meeting the evolving challenges of the forensic science field.

Bio of Presenter: David Fisher is the Director of the Forensic Science Program at New Jersey Institute of Technology. Prior to joining NJIT, he was a Criminalist in the Department of Forensic Biology at the NYC Office of Chief Medical Examiner. He is certified in General Criminalistics by the American Board of Criminalistics and is a Fellow of the American Academy of Forensic Sciences. He is also a member of the Vidocq Society, NJ Association of Forensic Scientists, and the Council of Forensic Science Educators. David earned his M.S. in Forensic Science from John Jay College and a BS in Biochemistry & Cell Biology from the University of California, San Diego. He is also co-author of the textbook, Techniques of Crime Scene Investigation, now in its 9th edition.

2023 ASQDE CONFERENCE ABSTRACTS

Kalantzis, Nikolaos

Title: Peer Reviewing Strategies & Requirements

Abstract: As bias – in its various forms – has been established in the practice of Forensic Sciences, so have the strategies to deal with it have been developed. As reflected in various international documents and standards, and as it is applied in QDE around the world, Peer Review is the most essential strategy to minimize bias. But how can Peer Review be applied? And what about smaller sized laboratories and practices? This presentation focuses on the various forms of Peer Review systems, the requirements that need to be met in order to guarantee quality management, and the problems (and solutions) of applying them to smaller structures.

Bio of Presenter: Nikolaos (Niko) Kalantzis has a BSc in Physics, a PgD in Forensic Science & an MSc in Questioned Documents and a he holds a diploma in Questioned Documents (FSSocDip) from the Chartered Society of Forensic Science of which he is a Professional Member. He works both for the courts of Athens and Piraeus and handles private cases as an examiner and manager of Chartoularios Institute, an associate member of the European Network of Forensic Handwriting Experts (ENFHEX), and is registered in the list of experts of the International Criminal Court at the Hague.Niko served as Visiting Research Fellow from 2008 and since 2018 is a researcher with Staffordshire University, participating in experiments and research projects as well as delivering lectures at undergraduate and postgraduate levels.

2023 ASQDE CONFERENCE ABSTRACTS

Kalantzis, Nikolaos, Maria João Branco, Tomasz Dziedzic, Dorian Kerzan, Erich Kupferschmid, Jonathan Morris, Elina Rönkä, Andreia Vieira, Nataša Žener

Title: New Approach to Best Practice in Forensic Handwriting Examination

Abstract: Forensic Handwriting Examination is a discipline in which human factors play an exceptionally important role. It is therefore particularly important in this field of forensic science to implement measures that foster objectivity, such as a quality assurance system, standardization, verification of results, participation in competency testing, or following relevant guidelines, which can take a form of best practice manuals.

In 2022, the fourth edition of the Best Practice Manual for the Forensic Handwriting Examination (hereafter BPM) was published. It was developed by a team of experts affiliated to the European Network of Forensic Handwriting Experts (ENFHEX), i.e., the discipline-specific Working Group of the European Network of Forensic Science Institutes (ENFSI). This work was funded by the European Commission under the Internal Security Fund (Police).In line with recent trends in forensic science, the BPM has now been structured around the ACE-V approach with new Appendices created to guide users through the key stages of the examination process.

These include:

- A Comparison Appendix which explains in detail how to systematically confront each handwriting feature in questioned and known samples and how to document the results.
- An Evaluation Appendix presenting a practical application of the process of evaluative reporting, i.e., how to evaluate all findings with competing propositions (hypotheses) in such a way as to obtain the value of evidential strength.
- A Sampling Appendix providing a procedure for collecting reference samples, both request and from the course of business.
- The preparation of a set of useful forms which can be easily adapted to the needs of individual laboratories and, as a result, contribute to transparency, error reduction, and to the standardization of examinations within European laboratories.

The BPM underwent public revision, including feedback from the ENFHEX member Institutes, as well as the revision from the Quality and Competence Standing Committee of ENFSI. The document, along with its Spanish and Italian translations, can be downloaded from the ENFSI website and used by all interested parties, free of charge.

Bio of Presenter: Nikolaos (Niko) Kalantzis has a BSc in Physics, a PgD in Forensic Science & an MSc in Questioned Documents and a he holds a diploma in Questioned Documents (FSSocDip) from the Chartered Society of Forensic Science of which he is a Professional Member.

2023 ASQDE CONFERENCE ABSTRACTS

Kulbacki, Kevin, Nikolaos **Kalantzis**, Batya Miller Fuchs

Title: A Primer to Signature Verification Algorithms (SVAs)

Abstract: Over the last decade there has been a significant shift towards conducting business in a paperless and digital manner. As part of this transition, the collection of Digitally Captured Signatures (DCS – a.k.a. biometric signatures, online signatures or dynamic signatures), has increasingly replaced traditional static signatures written on paper.

Traditionally, digitization of signatures has been accomplished with flat (2 dimensional) scanning of a signature executed on paper, that leads to the creation of a bitmap file (i.e. static signatures). While static signatures represent visual information in the X and Y coordinates only (and hence lack information regarding the dynamic aspects of signing), dynamic signatures capture the X and Y coordinates as well as Time and Force.

In conjunction with the faster pace of the digital world, businesses have had to adapt their fraud prevention efforts to handle not only more transactions, but also more sophisticated attempts at fraud. As part of these efforts, various companies have invested in the creation of Signature Verification Algorithms (SVAs). SVAs compare presented (questioned) and known signatures in order to potentially determine whether or not a given signature was actually prepared by the purported author. SVAs can be created for both static and dynamic signatures. While static signatures allow for the comparison of geometric comparison metrics, the inherent numerical nature of the DCS data allows the contemplation of statistical methods to characterize a group of “known” DCS and then compare a “questioned” DCS versus that group, effectively performing a statistical evaluation of authenticity.

While SVAs can be developed for both static and dynamic (DCS) signatures, the numerical nature of the DCS captured data allows for more in-depth analysis by an SVA. SVAs as described here are currently deployed in the banking sector as a form of authentication, providing live feedback regarding the authenticity of a signature executed at the teller or alternatively as a means of subsequently reviewing transactions. SVAs are currently deployed as a means of access control in military facilities. These are not the only possible applications of SVAs.

During this presentation, attendees will be introduced to what SVAs are, how they are used, and what factors must be taken into account when conducting validation studies of SVAs. Furthermore, this presentation will explore the possible uses, and subsequent requirements, for utilizing an SVA within a forensic context (potentially including either assisting the Forensic Document Examiner in their analysis task or alternatively serving as an extra peer reviewing safeguard). Finally, this presentation will also discuss the potential cognitive bias implications of SVA usage, and the additional research necessary for understanding SVA usage in any application.

2023 ASQDE CONFERENCE ABSTRACTS

Bios of Presenters:

Kevin Kulbacki is a Forensic Document Examiner and the CEO of KDX Forensic Consulting, having previously served as a Forensic Document Examiner for both state and federal law enforcement agencies. Kevin has his Bachelor's and Master's degrees in Forensic Science and is certified as a Diplomate of the American Board of Forensic Document Examiners. Kevin is actively involved in Standards Development as a member of the OSAC Forensic Document Examination Subcommittee and as the Chairman of the ASB's Forensic Document Examination Consensus Body.

Nikolaos (Niko) Kalantzis has a BSc in Physics, a PgD in Forensic Science & an MSc in Questioned Documents and a he holds a diploma in Questioned Documents (FSSocDip) from the Chartered Society of Forensic Science of which he is a Professional Member. He works both for the courts of Athens and Piraeus and handles private cases as an examiner and manager of Chartoularios Institute, an associate member of the European Network of Forensic Handwriting Experts (ENFHEX), and is registered in the list of experts of the International Criminal Court at the Hague.Niko served as Visiting Research Fellow from 2008 and since 2018 is a researcher with Staffordshire University, participating in experiments and research projects as well as delivering lectures at undergraduate and postgraduate levels.

2023 ASQDE CONFERENCE ABSTRACTS

LaPorte, Gerald

Title: 'Inconclusive' vs 'No Evidence to Support' When Determining Authenticity With Respect to the Purported Date

Abstract: "Everyone knows that a document is the product of a combination of several materials, such as ink and paper, put together by means of certain common instruments […]. Almost everyone, however, fails to appreciate fully that each of these materials and instruments has its individual and class characteristics, which in combination help to personalize and identify the document's source and history […]. It thus becomes necessary to discover and evaluate correctly each of these factors to reconstruct as much as the document's history as possible." (Hilton, 1982) When a Forensic Document Examiner (FDE) is asked to determine whether a questioned document (QD) was created and/or executed on the purported date, oftentimes the FDE will use the term 'inconclusive' if no evidence is found to show the questioned document was prepared on another date. Given that 'proving' a QD is truly authentic is nearly impossible but 'proving' a QD is inauthentic may be possible, is the FDE being given a biasing proposition. That is, if a gamut of examinations and testing do not show evidence of fabrication or manipulation then is it more transparent to use alternative terminology other than inconclusive. This presentation is intended to propose various case scenarios to generate discussion and thought about wether the inconclusive terminology in some cases may weigh against the case when a QD submitted for forensic document examination is truly genuine.

Bio of Presenter: Mr. LaPorte is a Forensic Chemist and Document Dating Specialist. He is also the Director of Research Innovation at the Global Forensic and Justice Center (GFJC) at Florida International University (FIU). Mr. LaPorte has been employed in various capacities in the forensic sciences since 1993, including the Director of the Office of Investigative and Forensic Sciences at the National Institute of Justice and Chief Research Forensic Chemist at the United States Secret Service. He has served as the Chairperson of the Forensic Document Examination Subcommittee on the Organization of Scientific Area Committees (OSAC) for Forensic Science. He has authored numerous publications, including chapters in three forensic science text books, and has testified as an expert witness in International and U.S. Courts over 125 times.

2023 ASQDE CONFERENCE ABSTRACTS

Luber, Jeffrey, Marisa Miliotto

Title: Not Your Grandparents' Transposed Signatures

Abstract: Abstract: The concept of a "cut and paste" signature to deceive has been around since the development of photography (albeit a forgery of a bank note) and more recently the toner machine copier. The advent of digital computer imaging has made this "cut and paste" signature to deceive process even easier, and sometimes undetectable. Today's presentation will demonstrate the ease of a transposed signature placement utilizing a transparent background and the subtle cues and associated difficulties needed for a differentiation of the background text printing from the signature printing.

Bio of Presenter: Jeffrey Luber is a Forensic Document Examiner with the Suffolk County Crime Laboratory in Long Island, New York. Jeff started his career in 1980 with a three year training program with Stephen McKasson at Illinois State Police Bureau of Scientific Services in Joliet Illinois. Jeff is a member of the ASQDE and is Board Certified starting in 1987, with the ABFDE. Jeff received his Masters of Forensic Science Degree from The George Washington University in 1980.

Mazzella, Williams

Title: Evaluation of sister line features in forensic handwriting examination

Abstract: Forensic document examiners are often confronted with questioned documents written with ballpoint pens. One of the characteristics of this writing instrument is that when the pen is held at a low angle, a shadow line, or "sister line," running parallel to the ink line is observed. This "sister line" is formed when the lip of metal housing containing the ball scrapes along the paper. In the course of a real signature case encountered by the authors, where the sister lines were only observed on the left of the inked lines, an experimental study was designed to acquire data to determine if the writer was right-handed or left-handed. Handwritten samples and signatures from 182 right-handed and 18 left-handed writers were collected and classified according to presence/absence of the sister lines. The results of this empirical study were used to assess the frequency, the position of the sister lines and finally to establish the handedness.

Bio of Presenter: Williams David Mazzella is a senior forensic document examiner within the "School of Criminal Justice" of the Lausanne University, Switzerland. He holds a master degree in forensic science from the same university and a PhD degree from the University of Technology, Sydney. He is certified (ISO 17024) by the Swiss Experts Certification Ltd. Williams is a corresponding member of ASQDE and serves on its editorial review board. He is author or co-author of many publications and presentations within the major forensic journals and forensic sciences encyclopaedia.

2023 ASQDE CONFERENCE ABSTRACTS

McClary, Carl, Kevin Kulbacki, Tim Campbell, Ted Burkes

Title: A Report on the Current Status of Image Capture and Storage Technologies by Forensic Document Examiners

Abstract: The Forensic Document Examination community has been utilizing image capture and storage technology in casework for decades. From the early days of wet photography to advances in digital imaging, the methods used to record evidence have advanced tremendously. Simultaneously, the instrumentation and software available to FDEs, such as instrumentation capable of spectral analysis and comparison software, has also become sources for the generation of additional files relevant to a case. Whether it's taking record shots and/or scans of the evidence or the files generated during other examinations, these files are a critical part of forensic casework. This multistage project is seeking to better understand current practices in the field for the use of these technologies, culminating in a better understanding on how various components of image capture and storage, including resolutions, file types, and more impact the Forensic Document Examination community. Part 1 of the project is a survey of the FDE community of current practices in use for image capture and storage including types of capture, file types, resolution, and medium/methods of storage. This presentation will discuss the results of the Part 1 survey. Part 2, to be presented at a later date, will be a practical test for the FDE community to gauge how changes in the aforementioned properties affect the resulting images.

Bio of Presenter: Carl McClary is a member of ASQDE and was a document examiner formerly with the Bureau of Alcohol, Tobacco, Firearms, and Explosives forensic science laboratory in Atlanta, Georgia. He is the past president of the Southeastern Association of Forensic Document Examiners and a fellow and past president of the American Academy of Forensic Sciences.

2023 ASQDE CONFERENCE ABSTRACTS

Neophytou, Andreas, Nikolaos **Kalantzis**

Title: Preparing for the new era: Setting up laboratories to deal with & take advantage of DCS technology.

Abstract: Even though DCS technology is being deployed around the world for several years, replacing traditional signatures in private and public transactions, the incoming QDE cases are limited. This creates the misconception that a. a laboratory can get trained in time when the need arises and b. the technology involved is to be considered only in case of a disputed DCS. Transitioning from traditional signature examination to DCS examination is not a trivial matter (even though publications of a detailed methodology exist) as there are several “new” parameters to explore. At the same time, DCS technology can be incorporated in every day casework with disputed traditional signatures, very much to the advantage of the QDE. In this presentations these matters will be discussed as well as how Cyprus Police Handwriting Laboratory and Chartoularios Institute (Greece) have restructured their processes to accommodate this new technology.

Bios of Presenters:

Andreas Neophytou is a Senior Constable 1665 and Forensic Handwriting Examiner with the Cyprus Police Handwriting Laboratory. Andreas is currently finishing a BSc in "Police Studies" and I have enrolled for BA in "Law" for the following academic year. Andrea joined the Cyprus Police force in 2008 and was placed in Criminalistic Services/Police H.Q. in Nicosia where he worked as a Crime Scene Investigator and Photographer until 2015. Since then he has been a member of the Handwriting Laboratory of the Service and recently became in charge of the newly created Digital Capture Signatures department of the Lab. His training includes courses in Cyprus, Greece and Israel, also having participated in training courses by U.K. officials.

Nikolaos (Niko) Kalantzis has a BSc in Physics, a PgD in Forensic Science & an MSc in Questioned Documents and a he holds a diploma in Questioned Documents (FSSocDip) from the Chartered Society of Forensic Science of which he is a Professional Member. He works both for the courts of Athens and Piraeus and handles private cases as an examiner and manager of Chartoularios Institute, an associate member of the European Network of Forensic Handwriting Experts (ENFHEX), and is registered in the list of experts of the International Criminal Court at the Hague.Niko served as Visiting Research Fellow from 2008 and since 2018 is a researcher with Staffordshire University, participating in experiments and research projects as well as delivering lectures at undergraduate and postgraduate levels.

2023 ASQDE CONFERENCE ABSTRACTS

Sugawara, Shigeru

Title: Examining the Consistency of Handwriting Produced on Various Tablets

Abstract: The study investigates the consistency of handwriting produced using different types of tablets. With the increasing use of digital devices, the demand for handwriting authentication has increased rapidly. As a result, it is essential to examine the consistency of handwriting on digital devices, which can vary based on the tablet's make and model, software, and hardware. The study aims to analyze the consistency of handwriting produced using different types of tablets and explore the factors that affect the consistency of handwriting. The research used a sample of myself and used different tablets to generate their handwriting. By analyzing the handwriting samples, the study seeks to identify the factors contributing to handwriting consistency or inconsistency. The research methodology involves data analysis and statistical modeling to determine the key factors contributing to handwriting consistency.

Bio of Presenter: Shigeru Sugawara holds a Ph.D. in engineering with a specialization in applied physics. Shigeru Sugawara is currently the senior researcher of a laboratory studying document examination at the National Research Institute of Police Science in Japan. Shigeru Sugawara has been researching document examinations for over 20 years.

2023 ASQDE CONFERENCE ABSTRACTS

Vaccarone, Paolo, Ahmed Gouhar

Title: Signature's "Road Length."A comparative Study Between Genuine and Forged Signatures

Abstract: The forensic examination of handwriting is characterized, proceeding with the rigorous application of a scientific methodology of investigation, by the analysis and study of general characteristics of the handwriting and other more detailed ones, as well as of the "static" ones and of the "dynamic" ones. There are many characteristics that a forensic handwriting examiner is called upon to analyze and many are those suggested by the most important authors (connections, dimensions, proportions, shape, inclination, line quality, etc.), some are measurable, others can only be estimated.

However, the arrival of the recent digitally captured signature technology (DCS) has allowed the expert to study and compare new characteristics, such as length of the line, its air stroke and its trajectories (IATs). The authors of this presentation, with different backgrounds and with different writing styles (Latin alphabet - Arabic alphabet), have tried to go further than the so far known study of handwriting for forensic purposes, studying and comparing the genuine lengths of the signature line and those that are forged (simulated).

The authors, simultaneously with each other, therefore involved 10 lay people for each style of writing (10 able to write with the Latin alphabet and 10 who use Arabic style) who were asked to simulate genuine signatures 5 times. The signatures to be forged were 10 made with Latin characters and 10 in Arabic. To have comparable data, and which therefore did not need to be subjected to a "normalization" procedure, the genuine signatures and all the simulated ones were captured with the same signature solution (Hardware: Wacom STU530 - Software: Namirial FirmaCertaForensic). The signatures, both genuine and forged/simulated one, were captured with the "hybrid" system (H-DCS) by placing a yellow post-it over the active area of the signature pad and the signatures were captured using the Bamboo "inking pen." With this procedure, the authors had both the traditional version (pen and paper - "P&P") and the digitally captured version (DCS) available for each signature, as well as all the biometric data, including the length of the line visible and that of the in air stroke.

Each "forger," before starting the counterfeit procedure of the genuine signatures, was also asked to fill out an anonymous questionnaire with which he gave information on his habits and gave his consent to the use of the data. The captured data made it possible to make a first comparison between the lengths of the lines between the genuine and simulated signatures so as to better understand this "new" feature of the handwriting examination. In a second step, the authors will verify if and how it is possible to measure the length of the line from the traditional signatures (P&P).

Bio of Presenter: Paolo Vaccarone, born in Roma where he have a degree in Law, is Italian Forensic Handwriting Expert [FHE], Document Examiner [FDE] and ASQDE Corresponding Member. He works daily with the Italian Prosecutor office and for Civil Court of Viterbo. Reporting Scientist at "Grafica Forense Srls".

2023 ASQDE CONFERENCE ABSTRACTS

Yang, Chiew Yung, Yvonne Hui Ying SIM, Michelle Yee Suan HO, Eddie Khay Ming TAN, Chin Chin LIM

Title: A Preliminary Study into the Application of AI and Machine Learning in the Classification of Wet Ink and Machine Reproduced Signatures

Abstract: Cut-and-paste manipulation, a common type of document forgery encountered in the authentication of documents, involves a genuine signature being transferred onto another document by means of a photocopier, scanner, or any device with photographic capabilities. Forensic document examiners examine a signature under the microscope to determine whether it was physically signed (i.e. “wet ink signature”) or reproduced using a photocopying/scanning device (“machine reproduced signature”).

For cases where the documents cannot be submitted to the laboratory, the examination would be conducted on-site using portable microscopes and magnifiers. In both instances, the examination process is manual and can be tedious and time-consuming in cases involving where voluminous documents. This preliminary proof-of-concept study applies Artificial Intelligence (AI) and Machine Learning (ML) to assist in classifying wet ink and machine reproduced signatures. This automated approach allows rapid, real-time on-site screening of documents to determine whether the documents were original (signed in ink) or photocopies (or scanned and printed copies), without the need of a microscope or expertise of a document examiner.

This would be a useful tool for investigators to provide a quick indication of the authenticity of documents. A total of 1,500 photomicrographs of original wet ink writing and machine reproduced writing were taken and used to build a database of known images. Images from this database were used for training and testing various models. A comparison of the results obtained from the various models will be shared, and promising models identified.

Bio of Presenter: Chiew Yung Yang (CY) is a Senior Principal Forensic Scientist with the Home Team Science and Technology Agency (HTX), Singapore, with about 20 years of experience in forensic document examination. She has a Bachelor of Science (Honours) degree in Chemistry from the University of Salford in the UK and a Master of Forensic Sciences Administration (Questioned Documents Track) from Oklahoma State University. She has been a Corresponding member of the ASQDE since 2011.

2023 ASQDE CONFERENCE ABSTRACTS

POSTERS

Arabio, Alexandra, Danica Ommen, Alicia Carriquiry

Title: Quantifying Writer Variance Through Rainbow Triangle Graph Decomposition

Abstract: Handwriting comparative analysis is based on the principle that no two individuals can produce the same writing and that an individual cannot exactly reproduce his/her handwriting. This project aims to assess and quantify the natural variations produced by a distinct writer. In an attempt to support traditional examination with objective measures, this project provides results from a study where features of handwriting are examined through point decomposition and rainbow triangulation.

Using this method to examine handwriting samples, more specific information can be obtained from each exemplar and can be standardized to be compared both within a writer and between different writers. The characteristics or landmarks of each handwriting sample that gets marked as a different color node include the location that a pen stroke begins (marked blue), the location that a pen stroke ends (marked orange), and any location where a pen line overlaps itself (marked pink), the highest location that a pen stroke reaches (marked green), the lowest location that a pen stroke reaches (marked purple). Triangles can provide information on angles, edge slopes, edge lengths, and areas that all prove useful for quantitative analysis and when trying to compare triangles in terms of similarity and possible congruency or similarity.

By forming rainbow triangles over these samples, it is possible to gauge the variation within a single writer and to compare these quantitative values to other samples of unknown sources. Rainbow triangles are formed so that each vortex or node within a triangle set has a unique color, and each edge is unique to its triangle so that it is not to be used to form a different triangle in another set. Using this information, the study aims to form a quantitative analysis of handwriting samples and to calculate how similar or dissimilar two samples are from one another. One of the study's main goals is to form these triangles from multiple samples from several different writers and to group, identify, and accurately determine what samples came from which writer. Finally, multiple summary statistics are explored to determine whether any can be used to discriminate between inclusions and exclusions using data where ground truth is known, such as a true match. This project hopes to impact the forensic community by demonstrating a new method for analyzing handwriting that could be used in junction with current practices to better quantify and support results regarding the source of a questioned document.

Bio of Presenter: Alexandra Arabio is a 2021 Graduate of Cedar Crest College with B.S. in Forensic Science and B.S. in Biology. Current M.S. Student at Iowa State University studying statistics and working as a Graduate Research Assistant at the Center for Statistics and Applications in Forensic Evidence (CSAFE).

2023 ASQDE CONFERENCE ABSTRACTS

Guscott, Janette

Title: The Velvet Room Homicide 2005

Abstract: Graphic maturity, Disguise, Quality, Quantity and Contemporaneousness – Known writing collected 15 years apart. A 15-year-old homicide case involving an anonymous letter, is submitted for examination. For the first submittal, collected, dictated, disguised exemplars and minimal contemporaneous, 2005, court documents provide limited comparable writing. A second submittal, two years later, contained additional contemporaneous, 2005, court documents with substantially more writing. These additional documents contained individual characteristics found in the anonymous letter and enabled a more comprehensive examination. Graphic maturity, disguise, quality, quantity, and contemporaneousness all play a part in a successful adjudication of the court case.

Bio of Presenter: Janette Guscott is a Forensic Document Examiner with the Unified Forensic Laboratory in Colorado. She earned her BS in Criminal Justice from Metropolitan State College and received her training at the Aurora Police Department in 2000. Janette is a member of the QD section of MAFS.

McCarley-Celentano, Darla

Title: I Had a Case #1, #2, #3...

Abstract: I Had A Case #1, #2 and #3…A Look Into the Unusual, Uncommon and Unexpected… Case #1 – An ordinary burglary with a smashing twist… Case #2…A bombing suspect with a connection… Case #3…A bank robbery suspect that wrote the check… Come and peruse these posters and wonder, what is truly unusual, uncommon and unexpected or all three rolled into one.

Bio of Presenter: Darla McCarley-Celentano is a Forensic Document Examiner with the Aurora Police Department/Unified Forensic Lab. She earned a Bachelor of Arts degree in Criminal Justice and Business Administration from Columbia College and completed training with the Colorado Bureau of Investigation and James "John" Hale Jr. in 2002. Darla is a member of QD Section of the AAFS, SWAFDE and MAFS.

2023 ASQDE CONFERENCE ABSTRACTS

MItchell, Linda

Title: Unexpected Complications of Closing a Private Practice

Abstract: A number of FDE's have chosen to retire from government service and open a private practice. Many of us are older and may be considering winding down. Some families and associates have been left sorting out their friend's affairs after an unexpected demise. This prompted me to investigate the different aspects of closing a private practice. What are some of the legal and possible tax consequences involved? What happens to cases where part of the retainer is earned, but no results have been provided? How can we plan ahead for a smooth transition to retirement? I am researching these and other questions with colleagues, and tax and business attorneys to illuminate our responsibilities and obligations to our clients and fellow FDE's. I will also share good sense suggestions from others experiencing this firsthand.

Bio of Submitter: Linda Mitchell is in private practice in Southern California with Forensic QDE Lab LLC. She holds a BS in Criminal Justice Administration from the University of Phoenix. From 2008 to 2011, she trained with the late Manny Gonzales, formerly of the San Diego PD Crime Lab. Thereafter she achieved her diplomate status in ABFDE and is a member of ASQDE, AAFS (documents section) and SWAFDE.

2023 ASQDE CONFERENCE ABSTRACTS

Molin, Anna, Diana **Belic**

Title: The Writing on the Mirror was the Key to Solving a Murder Case

Abstract: Abstract: The purpose of this poster is to show one of NFC's more unusual murder cases, where the handwriting examination was an important factor in the conviction of the suspected murderer. In January 2018 a person was found stabbed to death in a public restroom in the Swedish city of Örebro. The police were not able to secure any DNA, fingerprints or shoeprints on site, but the perpetrator had written "Why so serious" on the mirror, using the victim's blood. After a while letters started to arrive to the local police station, that among other things, contained sentences like "Why so serious" and some "poetry" about the crime. The main question from the police was primary if the person who wrote the sentence on the mirror also had written the letters to the police. The result of the handwriting examination supported that this was the case. The police later got a call from concerned friends of an individual who had bragged about the murder and about writing/playing with the victim's blood at the crime scene. A search in the suspects home uncovered blood from the victim on a back-pack and, among a few other things, the victim's identity card and bank card. The inquiry from the police was then if the writing on the mirror and the writing in the letters could be linked to the suspect. The result of the handwriting examination strongly supported that the person who wrote the comparison material also had written the questioned writing on the mirror and the letters to the police. The suspect was convicted in court of first-degree murder, and was, due to their young age (18 years of age) when the crime was committed, sentenced to twelve years in prison.

Bios of Presenters:

Anna Molin is a Forensic Handwriting Expert with the Swedish National Forensic Centre - NFC (former SKL). She holds a Bachelor of Arts in Archaeology from Umeå University, where she majored in Northern European Archaeology. In November 2006 she started her work as a Forensic Handwriting Expert at the Swedish National Laboratory of Forensic Science, and completed the training program in 2009. Anna is a corresponding member of the ASQDE and a member of ENFHEX.

Diana Belic is a Forensic Handwriting Expert with the Swedish National Forensic Centre - NFC (former SKL), Swedish National Police Authority. Diana holds a Bachelor of Social Science in Sociology from Linköping University. In January 2011 she started working as a Forensic Handwriting Expert at the Swedish National Laboratory of Forensic Science (SKL) and graduated the internal training program in spring 2013. Diana is a member of ENFHEX.

2023 ASQDE CONFERENCE ABSTRACTS

Schoenberger, Katherine

Title: Signatures of Adolescents

Abstract: A collection of signatures from 6th, 7th and 8th grade students. I spoke to students at my daughter's school to discuss forensic document examination. The students were asked to sign their names in order to assess complexity and style. This poster is a display of those signatures.

Bio of Presenter: Katherine Schoenberger is in private practice in Cleveland, Ohio. She earned a Bachelor of Science Degree in Physiology and a Master of Science Degree in Forensic Science both from Michigan State University. She completed her 2-year training from Frank Hicks and the Mississippi Crime Lab in 2001. Katherine is a member of the ASQDE and is certified by the ABFDE.

Tolli, Lisa

Title: 20 Years Later: Guess his Smith Corona WAS her TYPE

Abstract: In the 1980s, a woman met someone at a singles' club and went on one date with him before deciding it wasn't going to work out- he just wasn't her type. In the 20 years that followed, the victim and her family received over 100 typewritten and handwritten threatening postcards and letters, including two hoax IED parcels, that the victim believed could be traced back to that failed date. The US Postal Inspection Service was asked to investigate, and the evidence submitted to the Questioned Document section at USPS Forensic Laboratory Services was done over the course of three submissions. The first submission included a sampling of the threatening communications for writer association examination and determination of make and model of the typewriter that may have produced any typed impressions. The subject was a bit of a typewriter enthusiast and Postal Inspectors seized eight (8) different typewriters from his home. Based on the typestyle classification from the first submission, a known Smith Corona typewriter and samples from 7 other known typewriters from the subject's home were submitted for examination in the second submission. Finally handwritten documents were submitted for comparison to the threatening letters in the third submission. This poster will discuss the classification of the typewritten entries on the threatening postcards, and how that classification led investigators to the possible typewriter.

Bio of Presenter: Lisa Tolli is currently the Manager, Laboratory Operations & Quality Assurance at USPS Forensic Laboratory Services located in Dulles, Virginia, but she started her career as a Forensic Document Examiner with the same organization in 2008, and is still working QD cases. Lisa is a member of ASQDE, the Questioned Documents Section of the AAFS, ASCLD, and AFQAM.

2023 ASQDE CONFERENCE ABSTRACTS

SUBMITTED BUT NOT PRESENTED

Aginsky, Valery

Title: Ink Fading and Document Dating – A Case Report

Abstract: In a probate matter, one of the key issues was whether a 3-page Will, dated 13 August 1999 (the "1999 Will"), was produced and signed on or around the date shown on the document, or whether this document or any of the first two pages of the document were produced and signed significantly later – e.g., close to September 2018 when the Will was lodged with the Probate Registry. The Plaintiff's expert found as follows: 1) the signatures on page 1 of the 1999 Will were written within 2 years before their examination in July 2019; and 2) the signatures on page 1 of the Will were written by the blue ink of one formulation and the signatures on page 2 of the Will were written by the blue ink of a different formulation. Based on these findings, the Plaintiff's expert opined that the 1999 Will "was not prepared in 1999 as indicated, but at multiple occasions more recently, [namely after] July of 2017." This author, retained as the Defendant's expert, determined that: 1) the signatures on pages 1 and 2 of the 1999 Will were written by the blue ballpoint ink of the same formulation and likely with the same ballpoint pen; 2) the changes in the composition (ratios) of the dye components of the blue ballpoint ink on page 1, as well as the changes in the hue of this ink (in comparison with the blue ballpoint ink on page 2), are the result of the partial photo-decomposition of the ink on page 1; and 3) the toner of the printed entries on all the three pages of the 1999 Will corresponds to the conventional 8- to 10-micron black toner that was widely used in commercially available printers and copiers in the late 1990s. The judge accepted the ultimate conclusion made by the Defendant's expert: "The combined results of this examination provided evidence that supports the proposition that the 1999 Will was produced and signed on or around the date "13 August 1999" shown on the document (Hypothesis H1), and these examination results provided no evidence that would support a competing proposition that this 3-page document or any of the first two pages of the document were produced and/or signed at a much later point in time, e.g., in 2018 (Hypothesis H2)".

Bio of Submitter: VaLery Aginsky is a forensic chemist working in the field of forensic document examination for 40 years. He received his Ph.D. in Analytical Chemistry in 1980 from the Military Academy of Chemical Defense in Moscow, USSR. His training was with the Forensic Science Center of the Ministry of the Interior of the USSR. He is currently employed with Aginsky Forensic Document Dating Laboratory located in East Lansing, Michigan. Dr. Aginsky is the author of more than 30 peer-reviewed articles on ink analysis and document dating, including chapters in several books and encyclopedias.

2023 ASQDE CONFERENCE ABSTRACTS

Hecker, Thomas

Title: Atomic force microscopy as a potential alternative to scanning electron microscopy to determine the sequence of line crossings

Abstract: A very common method for the examination of line crossings is scanning electron microscopy. This method usually requires that a part of the document has to be extracted wich is a permanent change to the document. Depending on what SEM being used the document also needs to be steamed with carbon. The atomic force microscopy works with a quiet similar resolution but without the limitations of permanent changes to the document. Within a use case this method is being tested as a potential alternative to SEM.

Bio of Submitter: Thomas Hecker is a Forensic Document Examiner in private practice. He is certified by the German chambers of commerce and was trained by his father, Dr. Manfred Hecker. He earned a Diploma in Business Administration and is also a corresponding member of ASQDE since 2016.

Mogahed, Al Sharif, Noha A. Mohamed, Ahmed Saed Abdel Monsef, Hamada Abd El Wahab Ibrahim, Abd El-Aziz Zaki Gomaa, Mohammed Mohsen Bader El-Sabah

Title: Mono-chromic/thermochromic laser printer toner characterization using magnetic measurement, FTIR, and XRF Spectroscopy.

Abstract: This study aimed to characterize monochrome and thermochromic laser printer toner through qualitative and quantitative analysis. Regula Magmouse Model 4197, FTIR, and XRF Spectroscopy were performed on 60 printed samples of fifteen laser printing machines of different brands which are compatible with other twenty-three laser printing machines. The results showed that we could categorize samples into two major classes using qualitative analysis (magnetic measurements and FTIR) and FTIR to detect the color developer of the thermochromic toner. Then we did XRF Spectroscopy to get a fingerprint of each sample's elemental composition. Based on the results, XRF Spectroscopy was shown to be highly sensitive to measuring the percentage of iron in mono-component magnetic toner and the limited amount of iron detected by the Regula Magmouse Model 4197.

Bio of Submitter: Al-Sharif H. Mogahed is a Forensic Document Examiner with Forgery and Counterfeiting Researches Dept. Egyptian Ministry of Justice. He earned a Master's degree in physical chemistry from Al-Azhar University. Al-Sharif is a member of the ASQDE & the ASFDE.