



**2nd Conference of the European
Division of the International
Association for Identification
October 20th-21st 2016
Interpol Headquarters, Lyon, France**



With the major support of DIAMOND sponsor:



Welcome to our 2nd conference

Welcome to the second conference for the European division of the International Association for Identification.

Firstly, we would like to thank our hosts, Interpol, for making their facilities available to us for this conference and for the welcome we have received from them.

Organising this conference has required teamwork and communication from the Board of Directors who have worked to ensure that every thing is in place for this week. The biggest thank you should go to our Vice President, Teresa Wu, who never sleeps and has worked tirelessly to ensure that we attracted the impressive and highly valued sponsors.

Our responsibility is to our members and we have organised a conference with a variety of high calibre speakers who are the best researchers and practitioners in their fields. We hope that you learn from and enjoy the presentations and look forward to feedback from you all.

It is important that as European organisation we ensure that we have a different location every year and give members across the continent the opportunity to attend a first class training experience. The conference is an opportunity to meet others from the continent and share experiences and practice.

The final thank you is to our sponsors who have made this conference possible. Please make sure that you all visit their stands during breaks.

We welcome you all to our 2nd annual conference.

EU IAI Board of Directors



A Message from Our Division President

Aldo Mattei



Hello everyone and welcome to our 2nd divisional conference .

It is a great honour to be holding this at the headquarters of Interpol in Lyon. We hope that you all have time to enjoy the city of Lyon during your visit. I am delighted to welcome so many sponsors to this event and without their support we could not have put this together.

It is also important to thank the presenters for being prepared to share their knowledge and experience with us all, and I am sure we will all gain from this. I would also like to thank the poster presenters for their efforts. This opportunity to share knowledge and skills is so important to ensure that Forensic Science continues to advance.

Finally, I would like to thank the Board of Directors for their efforts organising this event and the Entire membership for their support. I hope that all of you enjoy the conference and I look forward to meeting you.

Aldo Mattei

President

The European Division of International Association for Identification

The EU IAI Officers and Board of Directors

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Vice President	Teresa Wu
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Special Thanks to Our Sponsors

Without the valued contribution of our sponsors it would not be possible to put on a conference of such high quality. Their contribution has enabled the Board of Directors to select a quality venue, attract top class speakers and also ensure your conference experience is provided at an affordable cost. With heartfelt thanks to our generous benefactors.

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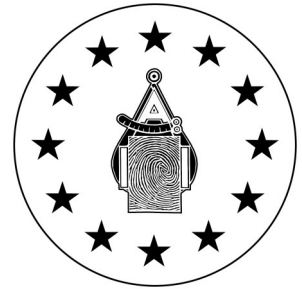


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THURSDAY 20TH OCTOBER 2016

- 0800 Registration Opens
- 0845 Presidents Welcome**
Aldo Mattei, EUIAI President

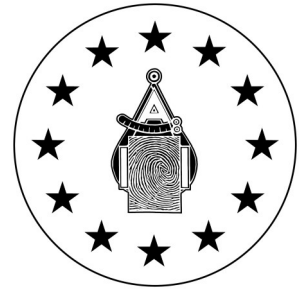


MAIN SESSION - Location

- 0900 ***Welcome Remarks by Interpol***
Mick O'Connell, Director, Operational Support & Analysis, Interpol
- Presentation of INTERPOL Biometrics***
Mark Branchflower, Interpol
- 0930 ***Forensic biometrics: quantifying forensic evidence from biometric traces***
Prof. Dr. Didier Meuwly, Principal Scientist - Netherland Forensic Institute
- 1000 ***"Is anything better than nothing?" Experience of Tenprint quality policies***
Gwladys Martin-Quenum , Gendamerie
- 1030 -1100 **BREAK**
Vendors displays
- 1100 ***Reporting standards***
Anthony Laird, Finnish National Bureau of Investigation Forensic Laboratory
- 1130 ***Latent fingerprint visualization using electrodeposited electrochromic (co-) polymer films***
Prof. Robert Hillman (University of Leicester)
- 1200 ***Flight MH17 Disaster Identification***
John Riemen, National Police of the Netherlands
- 1300 - 1415 **LUNCH**
- 1415 ***HMA vs Gordon Veitch, a multidisciplinary case study***
Professor Ivan Birch, Sheffield Teaching Hospitals NHS Foundation Trust

FRIDAY 21st OCTOBER 2016

MAIN SESSION – Location



0845 Introduction

0900 ***Multimedia Forensics: Recent Trends and Perspective***
Prof. Battiato

0930 ***Multibiometrics up to four biometrics for four usages (4x4 systems)***
Francois-Xavier Fraise, Safran Identity and Security

1000 ***Development of latent prints on cartridge cases***
Joanne Morrissey, Liverpool John Moores University

1030 **BREAK**
Vendor displays

1100 ***Why is there a white line in this latent print?***
Alice Maceo

1130 **EU IAI members meeting (mandatory for EU IAI members)**

1230 - 1330 **LUNCH**

1330 ***Wet-Vacuum Forensic DNA Sampling Dramatically Increases Capabilities To Collect Essential DNA Material And Solve More Crime***
Michael J. Sandling Crime Scene Investigation Equipment Ltd.

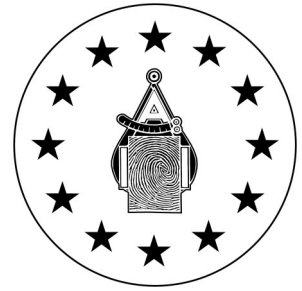
1400 ***PANEL DISCUSSION – Technology and Crime Scene Investigation Modernization***

Intro and Moderated by Zeno Geradt

Panel members: Clive Reedman, Morpho, Prof. Battiato

1445 ***Forensic Biometrics or Soft Biometrics applied to forensics***
Prof. Massimo Tistarelli

1500 – 1530 **BREAK**
Vendor displays



1530 ***Latent Prints in Blood- Hidden Meanings***
Carey Hall, Minnesota Bureau of Criminal Apprehension

1600 ***Lumicyano™, the one-step fluorescent fuming: current trends and ongoing developments***
Jeremy Malinge, Crime Scene Technology

1630 ***The Latent Imbroglia: Pattern Recognition with Fingerprint Examiners, Contextual Information and Motivation***
Francisco Goncalves, INTREPID, University of Leicester

1700 **Close of conference**
Aldo Mattei, EUIAI President

WORKSHOP SESSIONS

€35 fee per session max. 30 students per session

Room 1 – Location

9:30 – 12:30 ***Competency Testing for Latent Print Examiners (Cradle to the Grave)***
Ron Smith

Room 2 - Location

1330 - 1630 ***Palm Prints***
Alice Maceo

1900 – 2200 **GALA DINNER at LYON MARRIOTT HOTEL**
70 Quai Charles de Gaulle, 69006 Lyon
Presidents Address

Speakers Biographies and Abstracts:

Alice Maceo



Alice Maceo holds a BS in Biology from the University of Alaska, Anchorage and has been an active latent print examiner since 1997. She is currently the Forensic Lab Manager of the Latent Print section of the Las Vegas Metropolitan Police Department Forensic Laboratory. Alice has been certified as a Latent Print Examiner by the IAI since 2001; she is also a distinguished member of the IAI. Alice served on SWGFAST, the Expert Working Group on Human Factors in Latent Prints, and the IAI Editorial Board. She currently serves as an affiliate member of the OSAC Friction Ridge Subcommittee. Alice has published multiple articles and has lectured through out the U.S.A., Canada, and Europe.

Lecture

Why is there a white line in this latent print?

This lecture will explore the various reasons white lines appear in impressions of the friction ridge skin. Topics include creases, scars, aging, pressure-induced buckling, surface issues, and recovery methods. The reasons for the transitory nature of some white lines will also be discussed.

Workshop

Workshop #1 Impossible Decisions

The recording of the friction ridge skin, both latent prints and exemplar prints, is subject to a milieu of factors. Some of these factors can push the two impressions out of tolerance for variation in appearance, causing analysts to fail to associate a print with a person. This short lecture will show examples of images of the friction skin prone to these errors.

Workshop #2 Palm Prints

This workshop explores the embryological development of the hand, the ridge flows and crease patterns associated with the three regions of the palm, the population distribution of patterns in the three regions of the palms, and establishing efficient search parameters for palms.

Ron Smith, President of Ron Smith & Associates, Inc.



Ron Smith began his career with the Federal Bureau of Investigation in 1972, moving on to the Alabama Bureau of Investigation and from 1978 to 2002 with the Mississippi Crime Laboratory, retiring as Associate Director. He has over forty years of experience in latent print, crime scene and laboratory management practices and has been certified by the I.A.I. as a latent print examiner since 1978. In July of 2001, he was awarded the "John A. Dondero Memorial Award", which is the highest award bestowed by the International Association for Identification for exemplary contributions to the science of forensic identification. Ron has lectured on multiple forensic topics in all fifty of the United States and numerous other countries around the world. Ron Smith & Associates, Inc. has become the largest private provider of friction ridge examination training and consulting services in the industry and is on track to become the premier provider of pattern evidence proficiency testing services around the globe.

Pattern Evidence & SOCO Examiner Training. Where Has It Been, Where Is It Now, Where Should It Be Going?

With the immersion of society into the rapidly changing media driven world, the time has come where the forensic sciences can take advantage of technological developments not only in the laboratory but also in the classroom. Today's potential forensic examiner trainees already have substantial computer software skills before they enter into the working world. Simply put, they are not afraid of technology but rather, they embrace it. It is time for latent print, footwear/tire track and crime scene trainers and training programs to catch up to what our students can handle. They are more skilled in technology than we have been and they can handle much more than what has been considered best practices in the past. The "Baby Boomer Generation" is retiring faster than the "Millennials" are being trained. This void becomes greater due in part to the fact that our government focused industry is attempting to train this younger generation much the same way we were trained. This presentation will address past, current and future training philosophies in order to equip the delegate with several valuable tested and proven training concepts which will maximize the efficiency of any forensic training program.

Workshop #3 : Competency Testing for Latent Print Examiners (Cradle to the Grave)

In today's forensic environment it is the direct responsibility of the forensic service provider to ensure that the examinations performed by their forensic scientists are correct and consistent with best practices. For so many years it has been the unwritten rule that once a new examiner was trained to competency all they had to do, at most, was to pass an annual proficiency test. Although proficiency testing is certainly critical in this age of accreditation, it does not sufficiently answer the real questions regarding the ongoing competency of examiners who are working cases on a regular basis. As evidenced in the past decade (Mayfield, etc.), years of experience does not necessarily equal a higher quality output. This workshop will address methods which can be employed internally to properly assess the competency of the latent print unit staff members as their career advances. This approach will examine these issues from a task oriented perspective, such as latent evidence processing, latent print examinations under a glass, latent print examinations utilizing imaging software, AFIS searching, technical reviews, administrative reviews and training of subordinate latent print examiners. Participants will be actively involved in the workshop by discussing what they have done to address the competency of their own latent print units. They will also be asked to evaluate samples of competency testing modules to determine if they meet the actual needs of their agency. It will be a fast paced interactive workshop that you don't want to miss!



John Riemen



John Riemen is senior Biometric specialist to the National Police of the Netherlands and is the AFIS manager and the custodian of the National Criminal Dactyloscopic Database. He also is the specialist in charge of the Fingerprint department as part of the National Forensic Service Centre.

He has worked for more than 30 years in the field of law enforcement and forensic investigation. Over the years he has developed expertise in the use of forensic biometrics, forensic fingerprinting technologies, identity management, identity fraud, process development and design in the field of biometrics. He has degrees in management and business administration. Currently he is also member of the Executive board of the MorphoTrak users group as the international users representative and is guest lecturer at the Amsterdam University and Police Academy.

Flight MH17 Disaster Identification, National Police of the Netherlands

John Riemen is lead specialist of the National Police of the Netherlands Forensic Biometric Investigation team, and the manager of the national criminal fingerprint and face recognition system. He is a specialist in the use of forensic biometric technologies, as well as identity management, identity fraud, process development, and design in the field of biometrics. He has worked for more than 32 years in the field of law enforcement and forensic investigation. He has degrees in management and business administration

The 2013 Malaysia Airlines disaster over Ukraine presented a number of challenges in recovery and identification of the victims. Longtime Morpho customer Netherlands KLPD will discuss its role in this large-scale international project.

Francois-Xavier Fraise, Safran Identity and Security

Multibiometrics up to four biometrics for four usages (4x4 systems)



François-Xavier Fraise is Vice-President and General Manager of the Criminal Justice and Public Security Business Unit of Safran Identity & Security (former Morpho).

He holds a French Engineering degree, and a MS degree from Stanford. He also graduated from the French INHESJ (National Institute of Advanced Studies of the Security and Justice).

Francois-Xavier started his career with the French Government, where he was in charge of developing missile and satellite guidance and control programs, and later on, international relations.

Since joining Morpho as a program manager over ten years ago, Francois-Xavier has managed successful deliveries in the fields of Criminal Justice, Border Control, ID programs and Transport.

Since 2014 Francois-Xavier has led the Criminal Justice and Public Security Business Unit , in charge of satisfying customers in more than 60 countries with market-leader AFIS solutions and driving innovation in new domains such as multibiometrics, video analysis, DNA processing and mobility.

PRESENTATIONS

Mark Branchflower



Mr Branchflower joined New Scotland Yard fingerprint branch in England in 1984 as a trainee fingerprint officer. After qualifying as a fingerprint expert in 1989 he left the UK and in 1990 became a fingerprint officer with INTERPOL at its headquarters in Lyon France. Since 1990 he has participated in many INTERPOL European and International working groups on fingerprint standards, AFIS, training, disaster victim-Identification and DNA.

Currently as Head of the Fingerprint Unit his main duties are the organisation of INTERPOL fingerprint AFIS services, organisation of meetings and conferences and Identification projects. Currently Mr Branchflower is involved in several projects concerning the exchange of fingerprint information between Interpol member countries, increasing the use of INTERPOL AFIS services and developing the new Facial identification service.

Presentation of Interpol Biometrics

Michael J. Sandling , Crime Scene Investigation Equipment Ltd

Wet-Vacuum Forensic DNA Sampling Dramatically Increases Capabilities to Collect Essential DNA Material And Solve More Crime

When investigators are processing a crime scene or reviewing items in the lab for biological evidence, choosing the most effective and appropriate collection method is essential. Common methods typically available include swabbing, cutting, scraping and taping, and these techniques have been the mainstay of forensic DNA collection. In recent years, the importance of DNA evidence in solving both active and cold cases has increased dramatically, and much of society expects technological advances in all areas of obtaining viable profiles. As a result, huge amounts of money have been invested to improve the technologies and processes that contribute to a better DNA profile. However, the front end of that process, the collection of DNA material, is still a frontier with room for significant improvement, especially the collection of materials from large, rough and/or porous surfaces. The M-Vac System, a wet-vacuum collection system, focuses on that area.

The M-Vac Systems is helping investigators solve more crime through providing a more sensitive and scalable forensic DNA collection method. As a major innovation in surface sample collection, the M-Vac System's advanced wet-vacuum sampling device enables experts to better collect DNA material, often leading to stronger DNA profiles and more cases being solved. Effective micro-particle testing is based on the three principles: collection, amplification and detection, and each is equally critical. The M-Vac System raises the collection standard, and has potential to dramatically improve surface collection capabilities in nearly every scenario. In both the research setting and in actual casework, the M-Vac has differentiated itself from other methods, proving its value to law enforcement, the forensic sciences and society.

Prof. Sebastiano Battiato



Sebastiano Battiato received his degree in computer science (summa cum laude) in 1995 from University of Catania and his Ph.D. in computer science and applied mathematics from University of Naples in 1999. From 1999 to 2003 he was the leader of the “Imaging” team at STMicroelectronics in Catania. He joined the Department of Mathematics and Computer Science at the University of Catania as assistant professor in 2004 and became associate professor in the same department in 2011. His research interests include image enhancement and processing, image coding, camera imaging technology and multimedia forensics.

Multimedia Forensics: Recent trends and perspective

The keynote will give an overview of the recent development of Multimedia Forensics field with emphasis on recent results on image and video forgery. The possibility to reconstruct and discover the history of a multimedia contents will be exploited giving some details about current scenarios involving data shared on Social Platform (e.g. Facebook, Twitter, etc..)

Prof. Robert Hillman (University of Leicester)

Latent fingermark visualization using electrodeposited electrochromic (co-)polymer films

A wide variety of reagents is available for visualization of latent fingermarks on different surfaces exposed to diverse environments. In diverse ways – from mechanical adhesion of powders to sophisticated recognition chemistry – the general approach is interaction with the fingermark residue. Ultimately, the sensitivity of this approach is limited by the loss of residue as a result of environmental exposure. We adopt a complementary strategy, in which the fingerprint residue acts as a template to direct electrochemically generated reagent to the bare surface between the deposited ridges. When the object in question is metallic, application of an electrical voltage can be used to control the rate and extent of deposition of the reagent. The method has the advantage that even minute quantities of residue are able to fulfil the templating function.

The basic templating concept is demonstrated using electrodeposited polyaniline and PEDOT films, generating a negative image of the fingermark on a wide variety of metals of forensic interest, from metal theft to violent crime. The polymers are electrochromic: after transfer to background electrolyte, a small applied voltage can be used to vary film optical properties (colour) to optimize visual contrast. To expand the range of colours available, we extend the concept to copolymer films, illustrated here for a range of copolymers based on aniline-, pyrrole- and thiophene-type monomers.

We first establish (co-)polymer deposition rates under different conditions. Correlation of copolymer composition and optical properties with deposition solution formulation permits one to pre-select treatment protocols leading to optimum outcomes for given circumstances, including object surface composition and prior exposure to heat and water. Spectroelectrochemical characterization of the resulting copolymers and fingerprint images was then pursued at two levels. Digital optical images were split into their RGB components; this simple procedure gives improved visualization without complex instrumentation. More detailed FTIR spectroscopic analysis permits imaging based on specific functional groups within one or both co-monomers, offering the prospect of greater discrimination against background contamination. We finally consider the challenges and opportunities of practical implementation of this method, presently recognized as an emerging technology in the CAST Fingermark Visualization Manual.

Professor Ivan Birch, Sheffield Teaching Hospitals NHS Foundation Trust



Professor Ivan Birch is Consultant Expert Witness in forensic gait analysis with Sheffield Teaching Hospitals NHS Foundation Trust. Ivan graduated in 1978 with a BSc Joint Honours in Science from the University of Salford, gained an MSc in Human Biology from the University of Loughborough in 1980, and was awarded a PhD in Biomechanics by the University of Brighton in 2007. He has extensive experience of teaching biomechanics, anatomy, physiology and research methods, and is a Professional Member of the Forensic Science Society, and Emeritus Professor of Human Sciences. He is included on the National Crime Agency Specialist Operations Centre Expert Witness Advisers Database in the UK, and has more than 30 years' experience of gait analysis

HMA vs Gordon Veitch, a multidisciplinary case study

In October 2015 Gordon Veitch was found guilty at Edinburgh High Court, Scotland, of the murder of Brian Bathgate. The murder was originally thought to be a suicide, and as a result the crime scene was left unprocessed prior to the initiation of the murder investigation, leading to a multitude of complex challenges. The investigation drew upon the expertise of a range of police and forensic professionals, and an important aspect of both the investigation and the evidence presented at trial was the significance of two sequences of bloody footwear marks, both leading away from the scene of crime. The success of the investigation and trial was predicated on effective multiprofessional team work. The presentation will outline the case, and identify and discuss both the benefits and challenges of having such a diverse team working on the same case.

Prof. Dr Zeno Geradts



Zeno Geradts is a senior forensic scientist at the Netherlands Forensic Institute of the Ministry of Security and Justice at the Forensic Digital Biometrics Traces department in the area of forensic (video) image processing and biometrics. Currently he works at the team Forensic Big Data Analysis. From September 1st 2014, he is appointed as professor on forensic data science by special appointment at the University of Amsterdam.

Prof.dr. Zeno Geradts works since 1991 at the Netherlands Forensic Institute as a forensic scientist. Since 1997 he works at the digital evidence department. He is expert witness in image analysis and biometrics and works in the team Forensic Big Data Analysis. In 2002 he received a PhD from the University of Utrecht based on research on computational matching of forensic images. At the AAFS he has been chairman of the Engineering Section and since 2008-2010 chairman of the section Digital Evidence and Multimedia, he was elected by the section as member of the Board of Directors of the AAFS from 2010-2013. He is elected as Vice President of the AAFS 2015-2016 and 2015-2016 as Treasurer. He is chairman of the ENFSI Forensic IT working group. He published many papers in forensic journals and contributions to books and is active on case-work as expert witness and projects in digital evidence

Multimodal digital forensic science: future perspectives on multimedia forensics in combination with other digital evidence

Digital forensic science is integrated in most forensic laboratories nowadays. The best practice Manual on Forensic Examination of Digital Technology provided perspectives from ISO 17025 Perspective. The current disciplines that are seen with the Netherlands Register of court Experts (NGRD) is divided in computer forensics, network forensics, database forensics, software forensics and device forensics.

Francisco Valente Gonçalves, Intrepid, University of Leicester



Francisco Valente Gonçalves is a Marie Curie Early Stage Researcher within the INTREPID Forensics Programme. His research aims pass by understanding the effects of contextual information within the decision-making processes in forensic sciences and experts' motivations within their case work.

Francisco undertook his BSc in Psychological Sciences between Portugal (ISPA-IU) and Spain (Universitat de Valencia), having worked as an undergraduate researcher during this degree on developmental psychology. Having also a MSc in Psychocriminology (ISPA-IU, Portugal) he worked in the National Institute of Legal Medicine and Forensic Sciences as a forensic psychologist intern for one and half years. His MSc dissertation focused on the psychological assessment of simulated and dissimulated personalities in forensic context. In 2014 he completed a specialization in clinical intervention within the Mental Health service of Santa Maria's Hospital in Lisbon.

Prior his moving to Leicester he worked in risk contexts on topics such as sexual abuse, addictions and personality disorders as a clinical psychologist with children, youths and adults and as a forensic psychologist in the Prison of Leiria. He is enrolled in international scientific societies: The Chartered Society of Forensic Society; International Association for Forensic Institutes; European Society of Criminology; European Association of Psychology and Law; European Division of the International Association of Identification; Australian and New Zealand Forensic Science Society; American Academy of Forensic Sciences and Sociedade Portuguesa de Psiquiatria e Psicologia da Justiça. He is also an Effective Member of the Portuguese Psychologists Board, and works currently as a reviewer for three journals (Peritia - Revista Portuguesa de Psicologia, Portugal; Direito em Debate, Brazil; Forensic Sciences International). At the University of Leicester he is at the moment the Editor for the Social Sciences within the Frontier Magazine team and is part of the Leicester Judgement and Decision Making Research Group.

The Latent Imbroglia: Pattern Recognition with Fingerprint Examiners, Contextual Information and Motivation.

In the last ten years, the reliability of forensic sciences, has been called into question due to errors in expert evaluations which contribute to miscarriages of justice. Recent research has identified contextual information as a possible source of bias contributing to misguided decisions. However, in a time where the forensic laboratories need to be accredited, there is a need to understand what are the effects of the different types of contextual information and also what do fingerprint examiners think about these topics. The present paper aims to explore the effects that different contextual information have on the decision-making process that fingerprint examiners undertake, and also to retrieve the views of professionals in this field. To achieve these objectives, a mixed methodology has been applied with a wide range of examiners from 8 countries (U.S., Brazil, UK [England and Scotland], Netherlands, Belgium, Germany, Portugal, China) in a total of 16 forensic bureaus. Fingerprint examiners participated in a computer-based experiment (n=50) and in a semi-structured interview (n=45). Results show that specific types of contextual information have different effects on examiners' accuracy and on their motivation. These results go in the opposite way of previous research regarding contextual bias. The different types of motivation that examiners report in relation to doing this type of work were also investigated through individual interviews. It is also explored the differences within used methodology in each country and how this affects examiners' workflow and accreditation processes. This type of data is extremely important to acknowledge in order to understand what motivates these professionals in their case work and to relate it to the different types of contextual information. Taking this into consideration, critical opinions for the current international guidelines as well as new ways to recruit examiners can be suggested in order to improve forensic services worldwide and to support accreditation processes which are currently a specific need to be implemented.

Dr Roberto King, Foster + Freeman



Dr Roberto King is an R&D Applications Specialist at Foster + Freeman, UK. Roberto gained a 1st Class Honours degree in Chemistry and Sports Science from Loughborough University in 2005 and completed his PhD in Chemistry four years later at the same institution. He is a versatile inorganic chemist with expertise in the application of chemistry within the forensic arena. His background involves the development of novel fingerprint enhancing agents for use on troublesome substrates, as well as investigation into unique methodologies for evidence recovery from document based evidence. His current research interests involve finger-

marks, body fluids, questioned document examination, trace evidence and contact transfer. He has a keen interest in exploring long-standing forensic problems using fresh and lateral approaches that encompass all avenues of chemistry, physics and engineering. He is well versed in many areas of fingerprint forensics, document examination and trace evidence analysis.

Looking beyond the visible, and why - Novel approaches to latent fingerprint enhancement

Despite the vast quantity of fingerprint treatments currently available, forensic examiners continue to be frustrated by a number of 'difficult' substrates. Multi-coloured and densely patterned backgrounds, reflective metal surfaces and substrates that fluoresce at the same wavelengths as common fingerprint treatments, can all prevent the successful imaging of fingerprints. However, when dusted with novel, non-toxic, Infrared fluorescent powders, interference can be removed to reveal high contrast prints.

Studies exploring the use of these proprietary blended fingerprint powders have clearly demonstrated their effectiveness at revealing fingerprints on a wide range of non-porous and semi-porous substrates. The powders have the unique capacity to absorb light from across the visible spectrum and emit intense fluorescence in the near-infrared (NIR). One of the powders also extends its use to serve as the first example of a NIR-NIR fluorophore whereby both the excitation and emission wave-lengths of the developing agent fall into the spectral window of the NIR.

In most instances, the effect of these illumination/filtration combinations is a background which effectively 'drops out' or becomes extremely dark. The developed fingermarks, however, fluoresce brightly and allow maximum contrast and resolution to be achieved. The use of these powders on problem surfaces such as polymer banknotes, patterned substrates, metals and visibly fluorescent backgrounds has been shown to be extremely effective and competing fluorescence is rarely encountered.

The materials show promise for use both *in situ* at the crime scene as well as in the laboratory and have the potential to ease the decision making process relating to fingerprint powder selection as a function of the substrate it is applied to. Discussion of results and the benefits of these powders for recovering latent fingermarks from the upcoming (*at the time of writing*) Bank of England £5 polymer banknotes will be presented.

Anthony Laird, Finnish National Bureau of Investigation Forensic Laboratory

Anthony began his training as a fingerprint examiner in 1986 at the then, South West Regional Fingerprint Bureau in Bristol, UK. He transferred to the Finnish National Bureau of Investigation Fingerprint Department in 1992. Anthony has been responsible for the recruitment and training of the majority of the fingerprint examiners currently working in Finland. He published an article in the Journal of Forensic Identification on fingerprint analysis and comparison using a colour coding protocol. He took part in a long term project organised by the University of Helsinki Archeology Department, examining fingerprints found on stone age clay pot shards. In addition to fingerprint examination, Anthony recently spent some time working in the NBI tool mark and shoe print department. Anthony is a member of the Finnish Disaster Victim Identification team, a Certified Latent Print Examiner (IAI), he holds a BSc in Sociology and Social Policy, an MSc in Criminology and Criminal Psychology and is currently enrolled in the University of Portsmouth Professional Doctorate programme in Criminal Justice.

A Novel Approach to Examination Reporting

The Finnish police organisation is subdivided into two parts. There are uniformed police officers that deal mainly with issues of public order, initial response to incidents and crime scene examination; these officers tend to concentrate their efforts in specific regions. Additionally, the National Bureau of Investigation is, as its name would suggest, an organisation with national jurisdiction and is charged with investigating larger scale and higher level crime. One of the largest departments of the NBI is the Forensic Laboratory. In 1991, as part of the laboratory's on-going quality control program, a decision was made to attain independent FINAS accreditation for the laboratory. This was achieved in 1996. The process was taken a stage further this year when the majority of the laboratory's statements also gained independent accreditation by the FINAS accreditation organisation. The combination of a judicial system roughly based on the Napoleonic code, an independently accredited laboratory and statements have led to a rather novel method of reporting the NBI Forensic Laboratory's findings. This presentation will briefly cover the accreditation process and attempt to show how the Finnish method can increase efficiency, and potentially enhance the impartiality that forensic science aspires to.

Jo Morrissey, Liverpool John Moores University

Joanne Morrissey is currently the Programme leader for the undergraduate Forensic Science degree at Liverpool John Moores University. She was previously a Senior Forensic Practitioner with the Metropolitan Police Service in London for 17 years and the Forensic Manager for High Point Police Department in North Carolina. Jo has an MSc in Fire Investigation and is a Fingerprint expert.

Development of latent prints on cartridge cases

This is preliminary research in to the use of Gun Blue to enhance latent prints on selected cartridge cases, which may be found at scenes where firearms have been discharged. There have been some initial positive results and research is continuing. This research is being conducted in partnership between Merseyside Police and Liverpool John Moores university.

Carey Hall - Minnesota Bureau of Criminal Apprehension



Carey Hall has worked in latent prints for over eight years. Currently, she a forensic scientist working for the Minnesota Bureau of Criminal Apprehension does consulting work for Elite Forensic Services and previously she was employed by the Phoenix Police Department. She now has a unique perspective on the variety of different office policies, workflow, and technology within various agencies. Carey is an I.A.I. Certified Latent Print Examiner and is a member of the Friction Ridge sub-group of the Organization of Scientific Area Committees. She obtained her Master's degree in Legal Studies from Sandra Day O'Connor College of Law, at Arizona State University.

Latent Prints in Blood- Hidden Meanings

This lecture will explore three cases where blood was important to the suspects explanation of the crime scene. In two cases the suspect claimed the victim was the aggressor with a knife. Ridge detail in apparent blood was developed on the blade in one case, and on the handle in the other case. In the final case, the suspect's girlfriends prints and the victim's prints were developed on the wine bottle which was used as a weapon. The mechanism and action associated with the deposition of these prints were integrally important to the defense theory. The presentation will cover a review latent print blood research and the application of that research to criminal cases.

Jeremy Malinge, Crime Scene Technology



After completing a Master Degree in Organic Synthesis at the University Of Florida in 2009, Jeremy entered the PhD program at the Ecole Normale Supérieure de Cachan (France) where he get specialized in physical chemistry, photophysics in general and émissive material in particular. He co-authored 9 scientific peer-reviewed articles. After completed his PhD in 2012, he joined the Scientific Board at Crime Science Technology has the Research & Development Manager in 2015.

Area of expertise : Forensic Sciences, Physical Chemistry, Photophysics and Organic Synthesis

Lumicyano™, the one-step fluorescent fuming: current trends and ongoing developments

In 2011, Crime Science Technology has developed a revolutionary fingerprints development tool: the Lumicyano™. It allows the direct visualization of the papillary ridges of fingerprints as a white trace (as a classical cyanoacrylate) which becomes yellow fluorescent under UV or visible light irradiation in a single step. Lumicyano™ was designed to be used in conventional fumigation chamber (same temperature and hygrometry) with a processing temperature of 120°C and a hygrometry ratio of 80%. Thanks to these advantages, Lumicyano™ is currently approved by a large majority of law enforcement forces around the world. Indeed, its direct yellow fluorescence obtained without any post-treatment is advantageous for police forces unable to perform the post-treatment (laboratories with no fume hoods for example) and at least highly time saving for laboratories still using the post-treatment step. In addition, Lumicyano™ does not interfere with DNA analysis thus making genetic identification possible on a single fingerprint. Lumicyano is a bi-component technology composed of the Lumicyano Solution and the Lumicyano Powder, which the operator has to mix at a target concentration before starting the fuming process. After the fumigation cycle, the latent marks are directly fluorescent under forensic lightning. 20 % will be presented.



Prof dr Didier Meuwly, Principal Scientist - Netherland Forensic Institute

Didier Meuwly is born in 1968 in Fribourg, Switzerland. After a classical education (Latin/Philosophy), he educated as a criminalist and criminologist (1993) and obtained his PhD (2000) at the School of Forensic Science (IPS) of the University of Lausanne. Currently he shares his time between the Forensic Institute of the Ministry of Security and Justice of the Netherlands (Netherlands Forensic Institute), where he is a principal scientist, and the University of Twente, where he holds the chair of Forensic Biometrics. He specializes into the automation and validation of the probabilistic evaluation of forensic evidence, and more particularly of biometric traces. He was previously the leader of a project about the probabilistic evaluation of fingerprint evidence, and responsible of the fingerprint section within the NFI. From 2002 to 2004, he worked as a senior forensic scientist within the R&D department of the Forensic Science Service (UK-FSS), at the time an executive agency of the British Home Office. From 1999 to 2002 he was responsible of the biometric research group of the IPS. He is a founding member of 2 working groups of the European Network of Forensic Science Institutes (ENFSI): The Forensic Speech and Audio Analysis Working Group (FSAAWG) in 1997 and the European Fingerprint Working Group (EFPWG) in 2000. He is also a member of the editorial board and a guest editor of Forensic Science International (FSI) and a member of the editorial board of IET Biometrics.

Forensic biometrics: quantifying forensic evidence from biometric traces

The tutorial will begin with a short introduction of the Netherlands Forensic Institute (NFI), its tasks, its organisation, its requesters and the role of forensic biometrics within the Institute. Then it will concentrate on the **definition** of forensic biometrics, the description of the informative value of the different biometric **modalities** in a forensic context and cover the different forensic **applications** of biometric technology using operational examples. Then, the **validation** of forensic evaluation methods used to assess the strength of evidence will be presented in detail. Finally, the tutorial will conclude with a short overview of some current topics of research in forensic biometrics within the NFI.

Gwladys Martin-Quenem, French Gendarmerie Criminal Intelligence Service (SCRCGN).



This presentation will present how lack of information on the AFIS work led to a rapid and continuous degradation of the system, and how it is hard to get rid of bad and too easy practises.

For years French Gendarmerie units were asked to provide Tenprint (TP) cards where all fingers were of good quality. This process had for consequence a low ratio of tenprints finally recorded but a high quality database.

By the end of the 2000's, the AFIS version was upgraded, forensic missions became of interest and police forces became accountable for these activities. Finally, field investigators were urged for a dramatic increase of TP records. Based on a misunderstanding of the AFIS comparison performances; any card with at least one finger of good quality were to be recorded.

POSTER PRESENTATIONS

A Holistic Approach to Automatic Fingerprint Identification

Mr. Etienne Pillin, INTREPID Forensics, University of Leicester

The importance and usefulness of fingerprint matching in judicial systems is a prevalent topic. While automated matching systems have existed for years and are used on a daily basis by fingerprint examiners, only human expertise remains admissible in court.

My research aims at addressing several defects of current systems, namely precision, reliability and transparency, in the controversial aim of being admissible in court. In order to achieve this, my approach relies on innovative processing methods, clustering and machine learning algorithms. A data set to train these algorithms is required; unfortunately, there does not exist an efficient, detailed, large-scale fingerprint database that can be used for research purposes. Therefore, another part of my PhD project is to create and implement a collaborative ground-truth fingerprint database that can be used by institutions internationally. This raises issues from an ethical point of view which I will address, alongside the organisation of the database and the labelling of the fingerprints.

From copper to court: translation from the research laboratory to the practitioner of a new methodology for revealing latent fingerprints on metal surfaces

Ms Leisa Nichols-Drew BSc (University of Leicester and De Montfort University, Leicester)

There has been a renaissance in the innovation of physicochemical methods for the visualisation of latent fingerprints, but the challenge is their translation into the operational context. The situation is highlighted by the inclusion of a number of "category C" methods (emerging technologies) in the UK Home Office CAST Fingerprint Visualisation Manual: their exploitation is presently restricted by the need for forensic laboratories to satisfy ISO17025 and associated validation. This presentation will discuss an innovative approach to this problem.

The technology in question is galvanic silver deposition method for copper-containing metallic surfaces. An independent review was undertaken, using a non-fingerprint practitioner from a Forensic Service Provider, whose career background enabled the focus on five key criteria: safety, effectiveness, cost, application and chemical longevity. A standard operating procedure has been written and, subsequent to review by fingerprint experts, a validation plan developed. Communication to police forces and government agencies has resulted in visits to operational laboratories to demonstrate the technology. Consultation reveals significant operational potential, notably in the development of marks previously not viable for casework. Ultimately, this method promises identifications in offences as diverse as metal theft, violent crime and wildlife crime. The results of a CAST review, initial validation work and a pseudo operational trial will also be discussed. It is envisaged that this short term project will be an exemplar to others in promoting research to the end users and implementation within the Criminal Justice System.

The distribution & transfer of Gunshot Residue: can we truly establish a suspect-firearm link?

Lauren Blakey, Liverpool John Moores University. School of Pharmacy and Biomolecular Sciences.

Investigating the distribution, transfer and persistence of GSR as part of the work within the chemical ballistics research group at LJMU, samples were taken from specific areas on a recreational shooters body and their vehicles. Analysis was performed by scanning electron microscopy with energy dispersion x-ray analysis. The results indicated that significant amounts of GSR are also deposited in areas that are not routinely sampled by forensic experts. Moreover, such findings may have further implications surrounding the interpretation of GSR evidence

If only the walls could talk – Can fingermarks provide the answers?

Jo Dawkins – Anglia Ruskin University

Practitioners have found it increasingly difficult to recover quality fingermarks from the internal walls of major crime scenes. One suggestion may be due to the change in paint composition owing to the changes in EU Legislation regarding limitations of volatile organic compounds (VOC), meaning that more paints are now aqueous, rather than organic solvent based. Another reason for this is the large number of contemporary paint types that are now available, for example bathroom, kitchen, eggshell, in addition to the traditional matt and silk paints, and therefore it is often difficult to assess the porosity of the wall's surface and use the correct fingermark development processes in sequential order to maximise the potential yield of marks. The UK Fingermark Visualisation Manual provides guidance for practitioners on how best to recover fingermarks on matt and silk emulsion paints (in addition to satin and gloss for woodwork), but there is a gap in knowledge relating to newer paint types, such as bathroom and kitchen paint.

Therefore this study has assessed the efficacy of popular fingermark development processes (Ninhydrin and Magnetic Powders) to determine their success rates on the different types of 'simulated' walls. The finish of the wall (i.e. plaster, plasterboard etc.) has been examined to ascertain whether or not there is any effect on the development of fingermarks, along with the type of paint, the brand of paint, the age of the paint and age of the fingermarks. The type and brand of paint showed significant differences in results. The topography of painted walls has also been explored at a microscopic level to determine whether there is any relationship between this and the successful development of fingermarks.

This ongoing study is evaluating the efficacy of other development techniques that are used less frequently on painted walls, such as Powder Suspension and Silver Nitrate. This research also aims to develop a tool to assist practitioners in assessing the porosity of painted walls in situ at scenes in order that the correct processes can be applied. The results from this research will provide fingermark practitioners with more detailed guidance on how best to deal with the internal walls of major crime scenes in order to maximise the number of fingermarks recovered.

Investigating Visual Search Strategies in Fingerprint Recognition

Silke Jensen, School of Psychology, University of Leicester; Dr Doug Barrett, School of Psychology, University of Leicester; Dr Lisa Smith, Department of Criminology, University of Leicester; Francisco Valente Gonçalves, Department of Criminology, University of Leicester

When fingerprint examiners compare a set of prints, they rely on several visuoperceptual processes, such as pattern recognition, selective attention, and short-term memory. Previous high-profile cases as well as current research suggest that erroneous decisions in fingerprint examination are generally due to a combination of contextual bias as well as visual similarity of the latent and known prints. While addressing bias is key to rectifying this situation, understanding the visual processes and search strategies underlying fingerprint examination can aid in error mitigation.

We are investigating *where* in the fingerprint examiners extract information, and whether they weight information from different regions (such as the core versus the periphery) equally. We are also examining whether differences in information sampling and weighting are due to a) inherent differences in the information available in the fingerprint; b) learned differences in expertise; or c) general perceptual mechanisms. The poster will discuss preliminary findings, as well as the impact of this research on recruitment, training, and examination guidelines, as well as supporting expert witnesses in court.

Powder Suspension: A novel application method to develop latent fingerprints on wetted substrates 'in situ'

Merrin Hagger and Jo Dawkins – Anglia Ruskin University

Wetted substrates have a limited number of processes that can be used in order to reveal latent fingerprints. This can pose significant problems during routine investigations where pivotal evidence may have remained outside in inclement weather.

Furthermore, crime scene examiners are generally only equipped with powders to develop fingerprints 'in situ' which cannot be used on wet substrates and therefore many surfaces at volume crime scenes cannot be fully examined.

Powder suspension is a development process which is efficient at developing fingerprints on wetted substrates. It can be applied at crime scenes, but is a messy process, prohibiting it from being used routinely at volume crime scenes. Therefore this study sought to devise a new application method for powder suspensions, which could be utilised more easily by crime scene examiners; complementing the equipment that they already use. This would allow for significantly more substrates to be examined 'in situ' at scenes, even in poor weather conditions. This preliminary study achieved encouraging results with not only fingerprints being developed on wet substrates, but were also lifted whilst wet. Further research in this area is underway to conduct pseudo-operational trials

Using Novel 3D Comparative Techniques to Assess Skeletal Remains

Jessica F. Lam, School of Archaeology & Ancient History, University of Leicester

Dr. Jo Appleby, School of Archaeology & Ancient History, University of Leicester

Prof. Jeremy Levesley, Department of Mathematics, University of Leicester

Establishing the biological profile of an unknown skeleton involves assessing the sex, age, and ancestry of the individual, and is an integral part in identifying the deceased. Currently, the methods used by forensic anthropologists to determine sex and ancestry are largely based on visual or metric methods done by a trained analyst. Despite the training these individuals receive, there remains the issue of subjectivity in the form of inter- and intra-observer error. A recent venue of research in this field is the use of computer programs and 3D models to facilitate assessments. One approach relies on creating an ideal reference to which to compare an unknown specimen. The issue with creating an ideal reference is that the individual biological variation is lost and unaccounted for such that creating a true statistical probability of an assessment is impossible. Another approach uses a database of measurements and/or osteological landmarks to generate a statistical probability, but relies on manual inputs of measurements/landmarks which introduces subjectivity and human error. Additionally, even though this approach has been shown to work with 3D images, picking a given number of points discards all other available information – a 3D image consists of millions of points that could potentially be used in a computer analysis.

My research project therefore seeks to create a computer program that does not rely on manual inputs. Instead, the program will automatically compare an unknown 3D sample to all samples in a ground-truth 3D database, using all available/relevant data points instead of limiting the analysis on a small number of points. The result is a more statistically robust and objective analytical tool that can be used to improve the accuracy and reliability of sex and ancestry assessments. In turn, court admissibility of such techniques will be strengthened in forensic applications, and more accurate, less subjective identification of skeletons will be possible.

Implementation of the project APVV-0219-12 automation of search patterns soles

Radoslav Drapka, René Kliment, Marta Svítková

Institute of forensic science, Slovak Police Force, Slovak Republic

The development of an automated system, able to independently recognize shapes of traceology objects, increasing the efficiency of identifying objects. This will enable examiners to process large amount of prints from crime scenes including the diversity of sole designs in the catalog, manage sizeable databases, and duplicates.

Polymer Bank notes: How are we going to treat them?

Zoe Cadwell University of Leicester and Anglia Ruskin University

Polymer bank notes were first circulated in Scotland in 2015 and the Bank of England will follow in late 2016 with a new £5 polymer note. Although widely circulated in other parts of the world, these are the first examples of Polymer notes in the UK.

Internationally, latent mark researchers have published studies seeking the optimum method to enhancement fingerprints on this substrate but have encountered issues, with ridge detail development and visualisation. Key factors include the semi-porous nature of the substrate, the fine detail in inked patterns and designs and the fluorescence of security features.

The UK Fingermark Visualisation Manual provides guidance for the treatment of paper notes, but the section on polymer notes does not have an advisable procedure based on practical research. As fingerprint enhancement can be environment dependant, it is not applicable to assume that the advised methods elsewhere would be applicable in the UK.

This study aimed to assess various methodologies to enhance and visualise fingerprints on polymer notes by utilising a number of reagents and analysing their ridge detail development capability across the differential surface areas of the £5 Clydesdale bank note..

This study found interesting results when compared against internationally utilised processes in that such processes did not perform well. The research found a novel application of fluorescent Nano-powder to be an effective development methodology, performing well in all aspects of the study. It was effective on even the heavily dyed and patterned areas of the note, with which previous researchers have encountered development and visualisation issues. Identifiable fingermarks were developed across the time period of the study, up to 21 days after deposition.

These findings should prove to be of use to forensic laboratory officers in chemical enhancement units when presented with a polymer note for examination and the study has identified further research possibilities regarding detailed investigation of note topography.

This research was conducted as part of the author's MSc dissertation at the University of Leicester and in collaboration with British Transport Police.