Australian Academy of Forensic Sciences

THE ACADEMY: PAST, PRESENT AND FUTURE

A symposium for lawyers, forensic scientists, medical professionals and others

21 NOVEMBER 2017

Centre for Forensic Science
University of Technology Sydney (UTS)

UTS UNIVERSITY OF TECHNOLOGY SYDNEY

NCFS National Centre for Forensic Studies
UC | CIT | AFP

SYMPOSIUM AIMS

It is 50 years since the Australian Academy of Forensic Sciences (AAFS) was established by its founder, Oscar Schmalzbach. To mark this anniversary the Academy is holding a one day symposium on Tuesday 21 November at the University of Technology, Sydney (UTS). A formal dinner and plenary meeting of the Academy will be held on Wednesday 22 November where our plenary speaker will be the Hon Michael Kirby. The theme for these two events is **The Academy: Past, Present and Future.**

The one day symposium, generously hosted by the Centre for Forensic Sciences at the University of Technology, Sydney (UTS), includes four keynote presentations, four presentations by research students and four from early to mid-career forensic practitioners. I am delighted to have Claude Roux (UTS), Kristy Martire (UNSW), Soren Blau (VIFM) and Stephen Cordner (VIFM) as our Keynote presenters. My thanks also go to all of our other presenters at the symposium.

It is clearly not possible in a one day meeting to cover every aspect of the contemporary and emerging issues facing the forensic sciences. However, what my co-organisers, Claude Roux and Shari Forbes, and I, have attempted to do is to put together at least a snap shot of some of the work being done in Australia to contribute to solutions and better outcomes for the forensic sciences.

All presenters have been asked to provide a paper based on their presentations and these will form a special issue of the Australian Journal of Forensic Sciences (AJFS) which in turn will also turn 50 in 2018.

As President of the AAFS I warmly invite you to come along to the one day symposium and, even if you are not a member of the Academy, consider joining us at the plenary meeting on November the 22nd. Full details of both of the above events will be on the Academy website www.forensicacademy.org.

The great news is that the one day symposium will be a free event with a social mixer with drinks and canapes at the end of the day! All I ask is that you register to attend the one day symposium for catering purposes.

James Robertson

President AAFS

September 2017

ORGANISING COMMITTEE

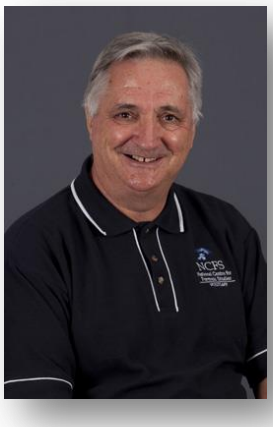
Professor Shari Forbes | University of Technology Sydney

Shari Forbes is a Professor and former ARC Future Fellow in the Centre for Forensic Science at the University of Technology Sydney. She is also the Director of the Australian Facility for Taphonomic Experimental Research (AFTER), the first human decomposition facility in Australia and the Southern Hemisphere. She is Secretary-General of the Australian Academy of Forensic Sciences and Vice-President of the NSW Branch of the Australian and New Zealand Forensic Science Society (ANZFSS). She is the Pacific Officer for the Initiative on Forensic Geology, a directive of the International Union of Geological Sciences.

Prof. Forbes' research focuses on chemically profiling the odour of forensic evidence using comprehensive two-dimensional gas chromatography. Her research aims to enhance the training of scent-detection canines used for safety and security purposes. She has more than 80 publications in this field and has been awarded $4M in competitive research funding. She has supervised more than 60 graduate students and early career researchers in forensic science. Her expertise is regularly requested to assist police with locating and recovering buried or concealed evidence, including human remains, drugs, weapons, and currency.

Prof. Forbes completed a Bachelor of Science (Honours) in Applied Chemistry and Forensic Science and a PhD (focus in Forensic Chemistry) at the University of Technology Sydney. She was the founding Director of the Forensic Science program at the University of Ontario Institute of Technology (UOIT) from 2005-2012 where she also held a Canada Research Chair in Decomposition Chemistry.

Professor James Robertson | Director NCFS, University of Canberra



James obtained his first degrees from the University of Glasgow, a Bachelor of Science (Honours) and PhD in the 1970's, and postdoc lectured in forensic science at the University of Strathclyde until 1985 when he moved to Australia. He was a senior case worker in South Australia until joining the Australian Federal Police in 1989 to head up their forensic group. Under his leadership, the latter developed into an internationally recognised centre of forensic excellence. James retired from the AFP in 2010 to join UC as a Professorial Fellow and as Director of the NCFS.

James is, or has been, an honorary or Adjunct Professor at several universities in Australia and overseas. He has edited or coedited a book series and

several forensic text books, has well over 100 papers and has delivered numerous invited and plenary lectures at international conferences. He is the Editor of the *Australian Journal of Forensic Sciences* and on the editorial boards of several other journals. James is President of the Australian Academy of Forensic Sciences (AAFS).

James has broad teaching and research interests, and specific interests in trace evidence and how the forensic sciences contribute to the criminal justice system.

James holds the Public Service Medal (PSM), is a Member in the Order of Australia (AM) and was made an Honorary Doctor of the University of Canberra in 2007

Professor Claude Roux | University of Technology, Sydney

After completing his undergraduate and PhD studies in forensic science at the University of Lausanne, Switzerland, Claude Roux migrated to Australia in 1996. Claude has been pivotal to the development of forensic science in his adopted country over the past 21 years by developing and leading the first undergraduate degree and PhD program in forensic science. He currently is Professor of Forensic Science and Director of the Centre for Forensic Science at the University of Technology Sydney (UTS). His research activities cover a broad spectrum of forensic science, including trace evidence and chemical criminalistics, documents, fingerprints, forensic intelligence and the contribution of forensic science to policing and security. His professional motivation has been largely driven by his vision of forensic science as a distinctive academic and holistic research-based discipline.

Throughout his career, Claude has published more than 165 refereed papers and 26 book chapters and a large number of conference presentations. He has attracted $5.5M in competitive research grants in the last 10 years, including ARC, other Government and industry funding. He also received more than 20 prizes and awards including from the National Institute of Forensic Science, the 2004 AIPS Tall Poppy Award and the 2015 Deputy Vice-Chancellor Research Medal for Research Impact (inaugural award). He has a long and established reputation for effective collaboration with forensic and other government agencies in Australia and overseas, as well as with other academic partners.

Claude is a member of the editorial board of six scientific journals and of a number of working and advisory groups in Australia and overseas. He was President of the Australian & New Zealand Forensic Science Society (ANZFSS) from 2010 to 2016. He is the President of the International Association of Forensic Sciences for 2017-2020, the current Vice-President of the Australian Academy of Forensic Sciences and a Fellow of the Royal Society of New South Wales. He also serves on the Scientific Advisory Board of the International Criminal Court.

50th Anniversary of the AAFS Symposium

The Academy: Past, Present and Future

SCHEDULE - TUESDAY 21TH NOVEMBER 2017

9.00 – 9.30	Registration
9.30 – 9.45	Welcome to UTS Senior manager, UTS
9.45 – 10.00	Opening remarks James Robertson, President AAFS
10.00 – 10.30	1st Keynote Speaker *Forensic Science 2020 – The End of the Crossroads?* Claude Roux, UTS
10.30 – 11.00	***Morning Break (refreshments)***
11.00 – 11.30	2nd Keynote Speaker *Clear Communication through Clear Purpose: Improving the Communication of Expert Evaluative Opinions* Kristy Martire, UNSW
11.30 – 12.00	3rd Keynote Speaker *It's All About the Context: Reflections on the Changing Role of Forensic Anthropology in Medico-legal Death Investigations* Soren Blau, VIFM
12.00 – 12.30	4th Keynote Speaker *Humanitarian Forensic Science* Stephen Cordner, VIFM
12.30 – 1.30	***Lunch Break (refreshments)***
1.30 – 1.50	Short Presentation *Predictive DNA Analysis for Biogeographical Ancestry* Elaine Cheung, UC

1.50 – 2.10 Short Presentation
Detection and Interpretation of Organic Gunshot Residues (OGSR)
Matthieu Maitre, UTS

2.10 – 2.30 Short Presentation
The Development of Latent Fingermarks on Porous Surfaces That Have Been Wet
Mackenzie De La Hunty, UTS

2.30 – 2.50 Short Presentation
Rapid On-Site Identification of Hazardous Organics at Fire Scenes
Rylee Lam, WSU

2.50 – 3.20 ***Afternoon Break (refreshments)***

3.20 – 3.40 Short Presentation
Textile Damage Examinations on the Cutting Edge – an Australian Perspective
Kate Sloan (nee Griffiths), AFP

3.40 – 4.00 Short Presentation
Illicit Drug Chemical Profiling: Current and Future State
Helen Salouros, NMI

4.00 – 4.20 Short Presentation
Forensic Imaging – The Future of 3D Crime Scene Data
Domenic Raneri, NSW Police

4.20 – 4.40 Short Presentation
Best Practice Recommendations for the Establishment of an Australian Identification Program for Missing Persons
Jodie Ward, NSW FASS

4.40 – 4.50 Closing remarks and thanks
James Robertson, President AAFS

4.50 – 6.15 ***Social mixer with drinks and canapés***

PRESENTERS | BIOS & ABSTRACTS

Claude Roux | University of Technology Sydney

Biography

As above (see “Organising committee”).

Abstract

FORENSIC SCIENCE 2020 – THE END OF THE CROSSROADS?

Forensic science has been at the crossroads, not to say in crisis, for over a decade. The robustness of the scientific foundations of essentially all of the forensic science disciplines is being questioned on a regular basis. Further, the usefulness of forensic science continues to be questioned by evaluative studies focusing on the judicial contribution. While this situation is a fertile ground for academic studies and various debates, security problem-solving and the sound administration of justice cannot be put on hold until solutions pleasing everyone emerge. In all practical reality, forensic science must and will continue to be applied because it is simply the only reliable way to reconstruct the past through the exploitation of relics of criminal activities and by logical treatment of the collected information (as opposed to using less reliable information such as witness statements, for example).

In this presentation, it is argued that instead of focusing on error management and processes, we should question the very ontological nature of forensic science. Not only should the dominant conception of forensic sciences as a patchwork of disciplines assisting the criminal justice system be challenged, but the forensic science own fundamental principles should also be better enunciated and promoted so they can be more broadly accepted. This is by no means a small task but probably the only way to fully exploit the investigative, epidemiological, court and social functions of forensic science.

We ought to ask the question: will forensic science reach the end of the crossroads soon?

Kristy Martire | University of New South Wales

Biography

Dr. Kristy Martire is a former ARC DECRA fellow and Senior Lecturer in the School of Psychology at the University of New South Wales where she is the Director of the Master of Forensic Psychology Program. She is also the Deputy Director of the Evidence-Based Forensics Initiative and has been examining the impact of expert evidence on lay decision-making for more than 10 years. Together with her co-authors she has published about scientific definitions of expertise (Melbourne University Law Review), the design of human performance tests (Australian Journal of Forensic Sciences), and the communication of expert evaluative opinions (Forensic Science International, Law & Human

Behavior). She is currently working with the Office of the Chief Forensic Scientist at Victoria Police to improve the communication of forensic science evidence to legal stakeholders (ARC Linkage Project 2016-2018).

Abstract

CLEAR COMMUNICATION THROUGH CLEAR PURPOSE: IMPROVING THE COMMUNICATION OF EXPERT EVALUATIVE OPINIONS

Expert evaluative opinions are provided to legal fact-finders and other stakeholders as a means of communication. Recent debate about the appropriate format for these opinions (e.g., categorical, likelihood ratio, verbal or numerical) has been accompanied by cognitive psychology research focused on understanding the impact of various reporting formats. Overall, the evidence highlights challenges associated with interpreting and understanding what is often complex and technical scientific evidence. Given this, it is important for forensic and cognitive scientists to think about how the communication of expert evaluative opinions can be optimized and improved. This requires careful consideration of the aims of expert evidence, as well as indicia of comprehension. What do we want factfinders and stakeholders to understand? What are the hallmarks of clear communication? A consideration of these issues provides a framework within which the expression of evaluative opinions can be iteratively refined and improved for the benefit of our justice system.

Soren Blau | Victorian Institute of Forensic Medicine

Biography

Soren Blau is the Senior Forensic Anthropologist at the Victorian Institute of Forensic Medicine. She is an Adjunct Associate Professor in the Department of Forensic Medicine at Monash University, Founding Fellow Faculty of Science, The Royal College of Pathologists of Australasia, and recipient of a Churchill Fellowship (2013) and an Australian Academy of Forensic Sciences Research Fellowship (2014). Soren is also currently the Chair of the Medical Sciences Scientific Advisory Group and a member of the INTERPOL Disaster Victim Identification Pathology and Anthropology Working Group.

Soren undertakes domestic forensic anthropology casework and has undertaken consultancies for the International Criminal Court (ICC) and the International Committee of the Red Cross (ICRC). Soren has participated in the recovery and analysis of human remains from archaeological and forensic contexts in numerous countries and has delivered training to forensic practitioners and related stakeholders in Australia and overseas. In addition to publishing peer reviewed journal articles and numerous book chapters, Soren co-edited the *Handbook of Forensic Anthropology and Archaeology* (2016) and co-authored *An Atlas of Skeletal Trauma in Medico-Legal Contexts* (in press).

Abstract

IT'S ALL ABOUT THE CONTEXT: REFLECTIONS ON THE CHANGING ROLE OF FORENSIC ANTHROPOLOGY IN MEDICO-LEGAL DEATH INVESTIGATIONS

The discipline of forensic anthropology has its roots in physical anthropology with early practitioners focusing on areas of study such as human growth and development, physiological adaptation, anthropometry, and biomechanics. A number of events led to the professionalization of forensic anthropology which is now a well-established and recognised discipline under the umbrella of forensic medicine and science. This presentation reflects on the development of forensic anthropology and the contributions practitioners make in Australian and international contexts.

Stephen Cordner | Victorian Institute of Forensic Medicine

Biography

Stephen Cordner graduated in Medicine from The University of Melbourne in 1977. After his internship at the Royal Melbourne Hospital he spent two years in the Department of Pathology at Geelong Hospital which was headed by Vernon Plueckhahn, Australia's foremost forensic pathologist. In 1981 he took up an appointment as Lecturer, and later Senior Lecturer, in Forensic Medicine at Guy's Hospital in London where he stayed until 1987. He worked there with Professors Keith Mant and Keith Simpson, the latter although retired being still active in the field. During this period he became a Fellow of the Royal College of Pathologists of Australasia and of the Royal College of Pathologists of Great Britain. He was appointed Foundation Professor of Forensic Medicine at Monash University and Director of the Victorian Institute of Forensic Medicine (VIFM) in 1987.

Following these appointments, his main priorities were establishing a credible service in forensic pathology and its related sciences of toxicology, molecular biology and histology. In the early 1990's, recognizing the contributions which could be made to health, VIFM established the Donor Tissue Bank, providing heart valves, skin, skeletal and related tissues for transplantation. Since its inception, over 20000 patients in Australia have received cadaveric tissue transplants donated by families of deceased through the Tissue Bank. At much the same time, the Institute began working on its contributions to public health and safety, bearing in mind that preventable death, whether by injury or illness, crowds mortuaries on a daily basis all over the world.

In 1995, VIFM became the home for Victoria's clinical forensic medicine service, a natural partner to the forensic pathology operation.

At the end of the 1990's, terrible events in East Timor precipitated by a referendum deciding to become independent of Indonesia, led to a number of VIFM staff undertaking missions to participate in exhumations and other death investigations. An attempted mutiny in Fiji in

2000 and the Bali bombing in 2002 resulted in further exposure to the international context of forensic investigations. These led to the year of 2003 being spent working with the International Committee of the Red Cross in Geneva as its Consultant in Forensic Pathology. This involved missions to the Former Yugoslavia and Iraq evaluating and providing advice to the ICRC about issues arising from the mass deaths in both those countries. It was only around this period that Stephen became more acutely aware of the tremendous contribution of his old mentor, Keith Mant, to the very early work of forensic pathology in the international domain.

Since 2003, Stephen has undertaken a number of missions for the ICRC, UNODC, and WHO. Many of these have related to 'The Missing', those unaccounted for, and often dead, following war or internal violence. Others have related to the immediate response to disasters, including Cyclone Nargis in Myanmar, Typhoon Haiyan in The Phillipines, the Nepal earthquake and the Ebola crisis in West Africa.

During this time of course, domestic operations continued. These have been materially assisted by the acquisition of CT scanning capacity in 2006. More importantly, the VIFM acquired administrative capacity that significantly improved its corporate abilities. There have been hiccoughs along the way. How one handles the mistakes that inevitably occur and the many problems that arise, are as much (if not more) a measure of the organisation as any success that might come its way. That might well be a topic for another talk some time!

Abstract

HUMANITARIAN FORENSIC SCIENCE

The 2017 Congress of the International Association of Forensic Science highlighted humanitarian aspects of the discipline. Forensic Science International has recently issued a virtual special edition on Humanitarian Forensic Science (HFS) (http://www.sciencedirect.com/science/journal/03790738/vsi?sdc=1) which is open access until the end of 2017. These simple examples demonstrate the mainstream nature of HFS. But what exactly is encompassed by the term. It is the application of the knowledge and skills of forensic medicine and science to humanitarian action, especially following conflicts or disasters. It has its early roots in the experience of the Argentine Forensic Anthropology Team, is moulded by International Humanitarian and Human Rights Law, and has been further developed by the International Committee of the Red Cross. This presentation will set out this background with examples drawn from specific conflict and disaster settings: Iraq, Typhoon Haiyan in The Philippines and the Ebola crisis in West Africa.

Elaine Cheung | University of Canberra

Biography

Elaine graduated with a Bachelor of Science at the Australian National University, majoring in Neuroscience and Mathematics. Her interest in the forensic disciplines together with the concept of molecular photofitting was what led her to complete her Honours in Applied Science at the University of Canberra. Under the supervision of Associate Professor Dr Dennis McNevin and Associate Professor Dr Michelle Gahan, Elaine researched classifier accuracy in the prediction of biogeographical ancestry. This work has been published in the *International Journal of Legal Medicine* and earned Elaine the Australian Federal Police Research Excellence Award for conducting the best research during completion of the Forensic Studies Honours course.

With the support of the Australian Government Research Training Program Scholarship, Elaine is currently undertaking her PhD to develop a continuous model for phenotype prediction. Admixed ancestry and various externally visible characteristics are likely to exist on a continuous scale. Prediction of such traits would benefit from a continuous measure, where in the case of ancestry, the relative proportion from each ancestral population of origin is reported.

Abstract

PREDICTIVE DNA ANALYSIS FOR BIOGEOGRAPHICAL ANCESTRY

The establishment of national DNA databases in Australia and overseas has increased the number of convictions in criminal investigations, however, a high volume of serious crime cases remain with no suspect profile nor any DNA database matches. An alternative solution for these unmatched profiles is DNA phenotyping. Biogeographical Ancestry (BGA) can be used in conjunction with externally visible characteristics to provide additional forensic intelligence. The human genome contains ancestry informative markers that can distinguish between ancestral groups at the continental level and some at the subcontinental level. Alleles are shared amongst genetically related populations and can be lost with genetic distance; therefore the best markers for inferring ancestry are those with large allele frequency differences between populations. This also opens up the possibility of generating a geospatial map of ancestral origin based on genetic distance.

A recent comparison of Bayesian approaches, distance-based algorithms, artificial neural networks, and regression models revealed differences in the predictive ability of these classifiers. Since phenotypes are likely to be continuous rather than discrete measures, some methods are inappropriate for the prediction of admixed BGA populations. A selection of these classifiers will be addressed in this presentation, with a focus towards the development of a continuous classifier for phenotype prediction.

Matthieu Maitre | University of Technology Sydney

Biography

Originally from Switzerland, Matthieu began his undergraduate studies in Forensic Science at the University of Lausanne (UNIL), in the Criminal School of Justice (ESC) in 2009. He quickly became interested in the question of applying science in the real world and the use of science outside of the laboratory.

After completing his undergraduate studies in 2012, Matthieu completed an internship as forensic officer with the Jura cantonal police force before undertaking a Master in Forensic Science (UNIL) specialising in identification. During this time, he became specialised in firearms investigation completing his thesis in the usability of elastomeric sensor for a 3D observation of marks on bullet and cartridges cases as well as toolmarks.

In 2015, Matthieu commenced his PhD at the University of Technology Sydney to extend his knowledge in firearm investigation by approaching the question of gunshot residues and more particularly the question of the interpretation.

Abstract

DETECTION AND INTERPRETATION OF ORGANIC GUNSHOT RESIDUES (OGSR)

Gunshot residues (GSR) are a potential form of evidence in cases involving questions relative to the association of a person of interest (POI) to a firearm-related event. Daily, in most forensic science laboratories, GSR analyses focus on the detection and characterisation of the inorganic components (IGSR) which are mainly particles composed of lead, barium and antimony originating from the primer. However certain particles cannot be assigned to IGSR with a high degree of confidence due to possibilities that they may have been derived from industrial and domestic sources. Moreover, the increasing prevalence in the use of heavy metal-free ammunition will challenge the current protocols used for IGSR analyses. This evolution in the firearm environment raises a number of issues in IGSR investigation as such ammunition fails to produce typical inorganic particles.

In order to provide complementary evidence to IGSR particles, the current study focused on the organic components (OGSR) arising from the propellant of the ammunition. To study the persistence, five compounds well-known as being part of OGSR were chosen: Ethylcentralite (EC), Methylcentralite (MC), Diphenylamine (DPA), 2-nitrodiphenylamine (2-nDPA) and N-nitrosodiphenylamine (N-nDPA). This study assessed the retention of OGSR traces on the POI's hands. This information is crucial for a suitable interpretation of OGSR evidence by taking into account the activity, the chronology and the circumstances of the case. Several time intervals between firearm discharges and GSR collection were studied in order to assess the influence of time and activity on detection of OGSR traces. Intervals ranging from 0.5 to 4 hours were chosen and two ammunition calibres which are frequently encountered in casework in NSW, Australia, .357 Magnum and .40 S&W, were studied. The preliminary trends and results will be presented and discussed in a forensic and interpretation point of view.

The overall project aim is to ensure an appropriate integration of OGSR trace evidence into an interpretation framework suitable for legal procedures. The use of the Bayesian theorem as the interpretation framework for OGSR is proposed as recommended by the recent ENFSI Guideline for Evaluative Reporting in Forensic Science.

Mackenzie De La Hunty | University of Technology Sydney

Biography

Mackenzie completed her Bachelor of Forensic Science in Applied Chemistry with First Class Honours and moved straight into a PhD, both at UTS. Her research has always surrounded investigating techniques to develop latent fingermarks on porous substrates, and she has been lucky enough to have presented this research at multiple international conferences. Her passion for science has seen her progress to a Scholarly Teaching Fellow at UTS, where she now teaches Chemistry and Forensic Science.

Abstract

THE DEVELOPMENT OF LATENT FINGERMARKS ON POROUS SURFACES THAT HAVE BEEN WET

A wide range of methods exist for the enhancement and detection of fingermarks. Research in this area is well advanced and Australia has been a leader in this field for more than 20 years. However, a number of critical issues remain, including the development of latent fingermarks on porous substrates that have been wet. Such development is currently limited to one technique in routine operational use, physical developer (PD). PD use is associated with a plethora of issues that include reagent instability, cost and the labour-intensive nature of the development process. Although there is some understanding of the working solution chemistry, the latent residue components that cause silver deposition from the working solution remain largely unidentified. This makes alternatives or improvements to the technique difficult to determine.

Research has been undertaken to investigate the chemical targets of PD contained in latent fingermark deposits through reactivity assessments of various lipid, eccrine and lipid-eccrine mixtures in the residue. Results have given much needed insight into not only the targets of PD, but also into the reactive and dynamic nature of latent fingermark residue. This presentation will describe these results and discuss the implications for operations and future research.

Rylee Lam | Western Sydney University

Biography

Rylee Lam is a current PhD Candidate at Western Sydney University. She is a graduate of the Bachelor of Advanced Science (Forensic Science) and Bachelor of Science (Honours) programs at Western Sydney University. Prior to her current studies, Rylee was a Research Assistant at Western Sydney working on a proof-of-concept project evaluating the applications of a portable Gas Chromatograph – Mass Spectrometer (GC-MS) at fire scenes. This work has fed into her current research on the use of field portable GC-MS for the rapid on-site identification of hazardous organic compounds at fire scenes. This project has been assisted by the New South Wales Government though its Environmental Trust Research grants program.

In addition to her research, Rylee also works as a Casual Academic and Technical Officer, assisting and teaching into Forensic and Chemistry units. She has also contributed to various training courses in the field of forensic science.

Abstract

RAPID ON-SITE IDENTIFICATION OF HAZARDOUS ORGANICS AT FIRE SCENES

Building and factory fires can pose great risk to human and environmental health due to the release of hazardous compounds in smoke and run-off water. Understanding the release of hazardous organics from fires is critical in understanding and managing the associated risks. As it stands, monitoring the release of hazardous compounds from a fire is a lengthy and involved process that requires complex sampling and laboratory-based analytical protocols. Furthermore, the results from such protocols are not immediately available to first responders. Without an accurate assessment of the release of hazardous compounds from individual scenes, appropriate site risk-assessment and management is impeded.

Recent advancements in field-portable instrumentation potentially allow for rapid on-site analyses for the real-time monitoring of hazardous organic compounds at incident scenes. This work evaluated a portable Gas Chromatograph – Mass Spectrometer (GC-MS) for the detection and identification of such compounds in air and water samples at fire scenes. The deployment of such instrumentation could provide first responders with a rapid on-site assessment tool that could be used for appropriate management of scenes, thereby ensuring environmental and human health is proactively protected and scientifically-informed decisions are made for the provision of timely advice to stakeholders. Used in conjunction with pre-existing environmental monitoring protocols, a more comprehensive understanding of the release of hazardous compounds from fires can be garnered for more effective incident response. In addition, for fires that may have been deliberately initiated, the rapid on-site detection of compounds that are diagnostic for ignitable liquids can provide early intelligence to assist with the forensic investigation.

This project has been assisted by the New South Wales Government though its Environmental Trust Research grants program.

Kate Sloan (nee Griffiths) | Australian Federal Police

Biography

Kate is currently the Team Leader of AFP Chemical Criminalistics team, and has been working as a forensic chemist since 2007. She obtained her Bachelor of Science (Honours) from UTS. Kate is a case reporting officer in paint, fibres and textile damage examinations, and is currently completing her PhD investigating the standardisation of textile damage examinations. Kate is currently the Chair of the Textile Damage Working Group, within the Chemical Criminalistics Specialist Advisory Group.

Abstract

TEXTILE DAMAGE EXAMINATIONS ON THE CUTTING EDGE- AN AUSTRALIAN PERSPECTIVE

Textile damage examinations are routinely performed in forensic laboratories to determine the type of damage present, for example a cut or a tear, and to offer an opinion on the mechanism that created the damage. The examination requires an understanding of the complex mechanism of damage formation to enable an accurate interpretation of the findings, and a reliable conclusion to be formulated. The report recently published by the Presidents' Council of Advisors on Science and Technology (PCAST) scrutinised numerous forensic feature-based comparisons, and highlighted deficiencies in the validity and reliability of such techniques. Whilst not a focus area of this report, textile damage interpretation is by necessity largely reliant upon a practitioner's opinion, experience and professional judgement, and is therefore subject to the report's criticism.

Significant progress has been made to strengthen the textile damage discipline since the 1980's when examinations were first conducted in the case of baby Azaria Chamberlain. The purpose of this presentation is to review the current state of textile damage examinations in Australia with respect to the PCAST report, and to survey the work being conducted to improve the foundational science and standardisation of damage analysis. Certain areas identified as requiring future attention and research, such as empirical studies, will also be discussed.

Helen Salouros | National Measurement Institute

Biography

Helen Salouros is the Deputy Director of the Australian Forensic Drug Laboratory of the National Measurement Institute. She has over 15 years' experience in the analysis and chemical profiling of illicit drugs and is the author of over 20 peer-reviewed scientific publications, conference papers and international presentations. Helen is renowned for her work on the chemical profiling of illicit drugs, particularly the application of stable isotope ratio analysis for illicit drug profiling.

She completed her PhD at the University of Sydney on 'Chemical Profiling of Amphetamine Type Stimulants' in 2009 and has since supervised Honours and Masters students. Helen sits on several scientific advisory boards including the Forensic Isotope Ratio Mass Spectrometry Steering Group and is the Chair of the Illicit Drugs Specialist Advisory Group. Her research interests are investigating new emerging illicit drug synthesis methods and developing capabilities to profile these drugs.

Abstract

ILLICIT DRUG CHEMICAL PROFILING: CURRENT AND FUTURE STATE

The Australian Forensic Drug Laboratory (AFDL) of the National Measurement Institute (NMI) routinely conducts chemical profiling of high volume drugs including heroin, cocaine, methylamphetamine and ecstasy (MDMA). The aim of this work is to provide strategic and tactical intelligence to law enforcement agencies to assist in their investigations and disruption of crime. Over the last decade the NMI's Illicit Drug Profiling Program has evolved in its chemical testing capability to adapt to the changes in drug landscape, technology, the needs of law enforcement and priorities of government. As critical issues continue to arise, the question of how we deliver drug profiling chemical intelligence that is useful, relevant and timely is of paramount importance. This paper will discuss how the implementation of new technologies, emphasis on research, continued process improvements and being adaptable to our surrounding environment has ensured we remain relevant.

Domenic Raneri | NSW Police

Biography

Domenic Raneri has been an officer with the New South Wales Police Force since 2013. He leads the 3D Crime Scene Reconstruction team of the Forensic Imaging Section, where he has introduced and developed their capabilities for forensic 3D imaging. Domenic has attended and completed crime scene reconstructions for over 60 recent and historical major crimes and events, including homicides, shooting incidents, terrorism events and serious motor vehicle collisions. Some notable cases include

the Rozelle Fire, Lindt Cafe Siege and Lin Family Murders.

Domenic received his Bachelor of Science (Forensic Science) from the University of Western Sydney in 2009 and his Bachelor of Science (Honours) the following year. His academic research was focused on enhancing juror ability to interact with forensic evidence by disrupting their preconceptions of the subject matter. He has lectured on forensic applications of 3D imaging technologies for a variety of detective and specialist unit training courses, as well as numerous national forensic committees and international forums.

Abstract

FORENSIC IMAGING – THE FUTURE OF 3D CRIME SCENE DATA

Modern advances in the field of specialist forensic imaging have allowed investigators unprecedented capability in comprehensive scene documentation and evidentiary analysis. Through the use of advanced photographic systems and sophisticated 3D laser scanners, investigators are now able to produce powerful 3D crime scene reconstructions, permitting innovative interrogation of evidence within the context of the original scene. This has revealed new lines of enquiry not previously possible, whilst effectively bringing the crime scene into the courtroom. In NSW these 3D imaging technologies and associated workflows have been implemented by the Forensic Services Group and have continued to be developed over recent years. As a result, these systems are now utilised effectively in the investigation of major crimes throughout the state. New types of analyses and methods of extracting information through these techniques are also being implemented, which may serve to change the way some aspects of forensic investigation will be conducted. Through the review of several prominent case studies, the process of 3D crime scene reconstruction will be demonstrated and numerous useful analyses within the 3D space which were not possible through conventional methods will be highlighted. Recently, new systems have allowed access to the true potential of this 3D crime scene data, with investigators and jurors across the state now able to visualise and interact directly with the 3D crime scene. By unlocking the interactive power of 3D data, crime scene reconstructions are becoming an increasingly powerful and relied upon method of reviewing and analysing scenes of major crime throughout the state of NSW.

Jodie Ward | NSW Forensic Analytical Forensic Science Service

Biography

Jodie Ward is the Team Leader of the Specialist DNA Laboratory at the NSW Forensic & Analytical Science Service. Having established this laboratory in 2015, she has since created a specialist DNA service for the identification of human remains. Jodie previously worked for the NSW Police and Australian Federal Police. She is also a Forensic Biology Lecturer at the Canberra Institute of Technology and supervises postgraduate research in her role as Adjunct Professional Associate at the University of Canberra.

Her current research interests include massively parallel sequencing applications for the DNA identification of compromised human remains. She was awarded a 2015 Churchill Fellowship to investigate DNA-led programs for identifying missing persons. This opportunity has informed recommendations for establishing an Australian DNA identification program for missing persons. She has a PhD in forensic molecular biology from The Australian National University, and postgraduate qualifications in management and education. She is a member of the Australian Academy of Forensic Sciences, International Society of Forensic Genetics, and a committee member of the NSW Branch of the Australian & New Zealand Forensic Science Society.

Abstract

BEST PRACTICE RECOMMENDATIONS FOR THE ESTABLISHMENT OF AN AUSTRALIAN DNA IDENTIFICATION PROGRAM FOR MISSING PERSONS

I was awarded a 2015 Churchill Fellowship to visit countries which have established successful DNA-led identification programs for missing persons and laboratories which have specialisation in the DNA identification of unidentified human remains. The goal of the Fellowship was to improve the DNA profiling outcomes for the 500+ cases of unidentified human remains in Australia by exploring and applying world-leading technologies to DNA identification casework, and devise recommendations for the establishment of a DNA identification program for the 2000+ long-term missing persons in Australia. Despite DNA being used worldwide to successfully identify large numbers of missing persons resulting from armed conflicts, human rights abuses and natural or man-made disasters, the routine processing of DNA samples for missing persons investigations is unaddressed and under-resourced in Australia, resulting in current casework backlogs. The introduction of a nationally coordinated DNA testing program and adoption of DNA technological advancements, will facilitate the cost effective and time efficient identification of Australia's unknown and missing citizens thus bringing closure to potentially large numbers of missing persons (and criminal) cold cases. I will translate key Fellowship findings into practical recommendations for the establishment of an Australian DNA identification program based on international best practice.

NOTES

NOTES

NOTES

NOTES

NOTES

NCFS

National Centre for Forensic Studies

UC | CIT | AFP

- Specialised Workshops
- Consultancy Services
- Quality Assurance Advice
- Chemical Analyses
- Biological Analyses
- Casework Reviews
- Training Courses
- Undergraduate Studies
- Postgraduate Studies

www.ncfs.edu.au

The National Centre for Forensic Studies (NCFS) is a partnership between the University of Canberra (UC), Canberra Institute of Technology (CIT), and the Australian Federal Police (AFP).

The purpose of the NCFS is to develop and deliver enhanced education, training and research opportunities for the benefit of the partner agencies and the wider forensic science community.

Areas of expertise include: crime scene examination and scene management, forensic biology, forensic chemistry, expert witness training, fingermark detection techniques, quality assurance and laboratory accreditation, environmental forensic chemistry, wildlife forensics, trace evidence, and much more …

Contact: Professor James Robertson (NCFS Director)
Ph: (02) 6201 2870
Email: james.robertson@canberra.edu.au

UNIVERSITY OF CANBERRA
AUSTRALIA'S CAPITAL UNIVERSITY
www.canberra.edu.au

Canberra Institute of Technology
cit.edu.au

AFP
AUSTRALIAN FEDERAL POLICE
www.afp.gov.au

Faculty of Science

Why Forensic Science at UTS?

Because UTS is reshaping forensic science

The UTS Centre for Forensic Science is a world-leading hub backed by renowned experts and world-class facilities.

Our forensic and analytical facilities are purpose-built, unique and fitted with state-of-the art equipment. Combine this with the 'cream' of forensic experts in the Southern Hemisphere, you'll be working with the best!

Our forensic scientists engage in a wide range of innovative and practical research activities, training and consultation that impact on national security, public safety and justice.

UTS Science also offers a suite of hands-on holistic forensic science degree with majors in crime scene investigation, forensic chemistry, forensic biology and digital forensic science.

The Australian Facility for Taphonomic Experimental Research (AFTER) is a unique body donation facility dedicated to the study of forensic taphonomy in Australia. It is the only such facility in the world outside of the United States of America.

www.forensics.uts.edu.au

UTSScience or CFS_UTS

UTS_Science

UTS Science

No. 1 UTS Ranked Australia's #1 Young Uni

World-leading forensic science

"I invite you to look at the evidence – our graduate profile that is second to none, our research achievements and our engagement with a large number of industries such as the Police Force both state and federal, NSW Forensic and Analytical Sciences Services, National Measurement Institute, ANSTO and many more."

Prof Claude Roux
Director, UTS Centre for Forensic Science
President, International Association of Forensic Sciences 2017-2020

UTS CRICOS Provider Code: 00099F
20162

REGISTRATION FORM

The Academy: Past, Present and Future

21 November 2017

DELEGATE DETAILS

Title: _____ First name: _____ Last name: _____

Organisation: _____

Address: _____

Suburb/Town: _____ State: _____ P/code: _____

Country: _____ Email: _____

Phone: _____ Mobile: _____ Fax: _____

REGISTRATION DETAILS

Morning/afternoon tea and lunch will be provided during the conference session breaks, in addition to drinks and canapés at the social mixer event following the symposium.

NO PAYMENT IS REQUIRED.

REGISTRATION IS REQUIRED FOR CATERING PURPOSES.

Registration closes on Tuesday 14th November 2017

Please return registration form to:
James Robertson
National Centre for Forensic Studies
Building 7, Level D, Room 7, University of Canberra, ACT 2601
Phone: (02) 6201 2870
Email: james.robertson@canberra.edu.au