

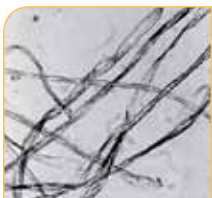


SCIENCE RESEARCH THEMES

science.uts.edu.au

UTS

THINK.CHANGE.DO



UTS: CFS
CENTRE FOR FORENSIC SCIENCE

forensics.uts.edu.au

THE UNIVERSITY OF TECHNOLOGY, SYDNEY'S (UTS) **CENTRE FOR FORENSIC SCIENCE (CFS)** IS A WORLD-LEADING ACADEMIC AND RESEARCH GROUP IN FORENSICS. THIS CENTRE PROVIDES A WIDE RANGE OF HIGH QUALITY RESEARCH, TRAINING, EDUCATION AND CONSULTANCY SERVICES IN FORENSICS TO ASSIST A VARIETY OF CORPORATE, GOVERNMENT AND COMMUNITY ORGANISATIONS.



POINTING THE FINGER

"In casework, many latent fingerprints are not detected despite the large variety of techniques currently available. In order to achieve maximum detection of fingerprints it is necessary to increase the sensitivity and selectivity of reagents by thinking outside the box - the use of novel reagents are beginning to demonstrate their vast potential"

Michael Wood is an international student who after completing his undergraduate studies in

the United Kingdom came to UTS to undertake a PhD in latent fingerprint detection. Using his undergraduate background and research in latent fingerprint detection he is currently working on a novel technique of fingerprint detection and development in the aim of producing transformational improvements in detection sensitivity. He was awarded an International Research Scholarship and Presidents Award Scholarship from UTS in order to undertake his PhD.

Our vision is in crime reduction, crime solving and national security in general for society, and that there are great benefits for Australia in modern and validated scientific techniques, processes and policies for the prevention and investigation of crime and terrorism.

Our niche is the application of enabling sciences to address questions that are fundamental to the concept of national security and public safety, including: intelligence, law enforcement and justice.

Our activities offer relevant practical solutions for organisations such as operational forensics laboratories, law enforcement agencies, law firms, insurance companies, as well as individuals and the community in general. Many of these solutions involve the Centre working in partnership with local and overseas businesses and organisations.

RESEARCH AREAS

The Centre provides extensive experience that is accessible to you and your organisation in collaborative research and innovation.

Areas of Expertise:

- > Fingerprints
- > Questioned documents
- > Trace evidence (fibres, paint, glass, miscellaneous, etc)
- > Fire investigation and analysis
- > Illicit drugs
- > Toxicology
- > DNA profiling
- > Forensic anatomy
- > Statistics and data handling
- > Interpretation

Further details of CFS projects can be found at www.forensics.uts.edu.au

Infrastructure

- CFS members work within UTS: Science's state of the art forensic laboratories including appropriate security and separate search rooms. UTS:Science has invested over \$3 million in forensic and analytical instruments and equipment, including:
- > A scanning electron microscope set up for gunshot residues analysis
 - > Comparison microscopes
 - > An 'automatic fibre finder'
 - > Forensic imaging systems
 - > DNA sequencing infrastructure

- > Various types of instrumentation including hyperspectral infrared imaging, laser ablation inductively coupled mass spectrometers, accurate mass quadrupole time-of-flight mass spectrometers, and advanced separation techniques such as liquid chromatography and microfluidic electrophoresis.

Access to UTS: Science's large pool of world-class instruments is available to all UTS students, researchers and academics for teaching, learning and research activities.



TRACKING DOWN 'MR BIG'

"The rapid and accurate identification of illicit drugs at crime scenes is a crucial step towards the fight against drug-related crime. The increasing number of drug seizures and clandestine laboratories has generated a growing demand for the development of portable devices for this purpose."

Aimee Lloyd joined the UTS Centre for Forensic Science in 2009. Her background in Chemistry and Statistics was developed through undergraduate studies in New Zealand and reinforced through work experience at the Chemistry Centre in Western Australia. Aimee's PhD project focuses on the evaluation of a unique portable device for the analysis of a commonly encountered group of illicit drugs called amphetamines.

COLLABORATE WITH US

The Centre has a demonstrated track record of collaborative research with Australian and international organisations and industries, ranging from law enforcement agencies and other public services in analytical and petroleum companies.

Recent examples include:

- > National Institute of Forensic Science-led project entitled building illicit drugs forensic capacity in Australia (funded by the Attorney-General's Department);
- > National Institute of Forensic Science's innovation pilot project on explosives analysis, with the Australian Federal Police, NSW Police Force and two other Australian tertiary institutions;
- > Four separate projects funded by the National Security Science & Technology unit of the Australian Prime Minister & Cabinet, one project led by UTS with the Australian Federal Police and others (lab-on-a-chip), two projects led by the Australian Nuclear Science and Technology Organisation (ANSTO) in nuclear forensics, and one by the Biometrics Institute (fingerprint identification vulnerability);
- > Varied and in-depth research into fingerprint detection in collaboration with the Australian Federal Police and two other tertiary institutions;
- > Novel research into forensic intelligence in collaboration with the Australian Federal Police and a number of police forces in Australia and overseas, and the University of Lausanne (Switzerland).

Services and Consultancies

The Centre provides expert services and consultancies through accessUTS in a number of areas, including:

- > Criminalistics/trace evidence
- > Explosives residues
- > Fire investigation and analysis
- > Illicit drugs/toxicology
- > Questioned documents
- > Marks and fingerprints

Stakeholders

- > **National Network** - The Centre has many community connections including senior representatives from the NSW State and the Australian Federal Police, the National Institute of Forensic Science (Australia) and relevant private businesses.
- > **International Network** - Our academic staff members have specific undergraduate and postgraduate forensic training, as well as impressive experience in the field. Our extensive networks with the international Forensic Science community ensures we are globally relevant - a situation unique in Australia.

- > **Multidisciplinary** - Our academic staff have expertise and skills in a variety of scientific disciplines, including: Analytical Chemistry; Molecular Biology and Physics. The Centre's key strength is its multidisciplinary approach and involvement with experts from disciplines such as information technology, law, business and engineering.

Postgraduate Research Degrees

UTS:Science is committed to spearheading innovation through degree programs that are strongly linked to industry, the scientific community and the population. All research degrees have a 100% research component aimed at producing a thesis that contributes new knowledge to the field of research.

FIRE INVESTIGATION AND ANALYSIS



"Developing a more holistic understanding of how polyurethane behaves prior to and during the flaming stage as well as the post suppression stage of a fire will potentially save lives"

Kate Grimwood is a forensic chemist with a passion for fire. Kate completed her undergraduate studies at UTS and is nearing the end of her UTS PhD in Forensic Science.

Kate's interest and experience in fire investigation coupled with her chemical background helped her make advances to better define the link between polymeric materials and the decrease in the time till flashover, an un-survivable stage in a fire. In addition Kate is working towards determining the presence of hydrogen cyanide and other toxic gases in the heating stage of a fire. The completion of this research will benefit practitioners, emergency workers and occupants alike.

DNA PROFILING STIRS CONTROVERSY



"Volume crimes present an enormous cost to the Australian community. The forensic response to these crimes could be increased with the use of trace DNA; however a lack of knowledge into the trace evidence characteristics of DNA has inhibited its application. With a greater understanding, the effectiveness of trace DNA evidence in the investigation of volume crime may be enhanced"

Jennifer Raymond is a Crime Scene Officer with the NSW Police Force Forensic Services Group. She recently completed her UTS PhD in the investigation of factors affecting the use of trace DNA evidence in combating offences such as burglary and robbery. Dr Raymond is currently attached to the Specialist Location & Recovery Unit, which applies the latest forensic technology and techniques to the most serious offences in NSW, primarily homicides. Demonstrating the value in developing effective relationships between academia and industry, aspects of her research were able to be applied in a homicide investigation, where experiments were used to assist with the interpretation of a trace DNA profile.

HOW TO APPLY?

For information and a step by step guide to apply for a research degree at UTS:Science please visit www.science.uts.edu.au/for/future/research.html

SUPERVISION

To find a suitable supervisor in CFS, visit

<http://datasearch2.uts.edu.au/research/strengths/fs/members.cfm>

For further assistance you can contact the UTS Science Research & Development Coordinator on:

Phone: + 61 2 9514 2490

Email: science.research@uts.edu.au

FEES

Local applicants:

www.sau.uts.edu.au/fees/postgraduate/research.html

International applicants:

www.uts.edu.au/international/prospective/studying/fees/

SCHOLARSHIPS

UTS:Science offers generous competitive research and coursework scholarships attracting the best students to work with teams of world-class researchers. Information about UTS:Science scholarships can be found at <http://datasearch2.uts.edu.au/science/scholarships/index.cfm>

For international student scholarships please visit

<http://datasearch.uts.edu.au/international/prospective/studying/scholar/index.cfm>

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OTHER UTS:SCIENCE RESEARCH THEMES:

- > The ithree Institute (i3)
www.itthreeinstitute.uts.edu.au
- > The Plant Functional Biology and Climate Change Cluster (C3)
www.c3.uts.edu.au
- > Institute for Nanoscale Technology (IINT)
www.nano.uts.edu.au
- > Centre for Environmental Sustainability (cens)
www.research.uts.edu.au/strengths/es/overview.html