Science in Focus: The future of Forensic Science

Crime, security and investigation the future of forensic science Panel Discussion

Q: What are some of the new threats to our national safety that have been increased by Covid-19 related regulations?

A: Cybercrime has increased during the COVID pandemic. This may be because more and more people have used cyber technologies during this time. Cyber criminals are exploiting this fact and have launched different types of cybercrimes, like hacking, online fraud, cyber harassment and misinformation via social media, image-based crime, etc. The popularity of video conferencing tools, like Zoom, has also brought real-time cybercrime, like Zoom bombing. I believe these cybercrime issues have direct and indirect impact on national security.

Q: How it is possible to detect or extract DNA in the case of older fingerprints?

A: It can be difficult to get a usable DNA profile from older fingermarks because DNA degrades over time when exposed to a variety of environmental factors (sunlight, moisture and bacteria to name a few). There are new extraction methods currently being researched that may improve our chances of recovering enough in-tact DNA for profiling. Generally speaking, the older the trace, the less likely we'll be able to detect good quality DNA traces. The big catch is that, at the moment, there is no reliable method of estimating the age of a fingermark or how degraded DNA may be before detection and analysis.

Q: Any tips on becoming a forensic scientist? Do you need to have a science degree?
A: If you're interested in becoming a forensic scientist, UTS's Bachelor of Forensic Science degree is a good place to start. While forensic science intersects with a number of other scientific disciplines, it is more than just an application of related sciences and there are certain concepts that are more closely related to historical science (e.g. archaeology) or require familiarity with law and social sciences.

UTS's course will give you a thorough understanding of how forensic science can solve and prevent crime. It's a hands-on course using world-class facilities, modelled on operational laboratories. Our degree is well regarded, with strong links to industries such as the federal and state police services, national and international forensic institutions, and government laboratories.

Q: Is cybercrime easier to detect than one in the real world?
The answer is yes and no. If cybercrime is done naively, it can be detected easily by agencies. But, in most cases cybercriminals are tech-savvy and they can operate from a foreign territory. In that case, detecting cybercrime is harder. There have been past examples where organized cybercrime or cyberwarfare remained undetected for years.

Q: Do you think the time will come when the government will have a DNA bank for everyone in Australia? Or a national fingerprint register?

A:
Mano: If there is a national policy for collecting everyone's DNA, this may be possible. The technologies are certainly there. The big question is whether there will be a national policy. This is a harder question as there are serious issues of ethics and privacy.

Xanthe: It's difficult to say. While there are benefits to national biometrics databases for a number of forensic investigation scenarios, there are also ethical, security and privacy implications associated with such databases.

Q: Are there privacy concerns for using data to prevent crime? How does the AFP approach this?

A: Yes, the AFP does consider privacy issues when using data to prevent/investigate crime. The Australian Privacy Principles (APPs) are located in Schedule 1 of the Privacy Act and are summarised in s. 6 of this guideline. The APPs govern the way the AFP collects, uses, discloses and stores personal information.

Q: Is the AFP sufficiently prepared for the huge growth in digital crime expected in coming years?
A: The AFP continues to position itself for the future. One aspect of the preparation is the recent recruitment of new specialists into the AFP's Digital Forensics team as well as developing and introducing new tools to streamline and automate processes to maximise efficiencies to meet the demand. This, coupled with enhanced training for

our specialists and investigators will be a force multiplier, and ensure that the organisation is ready to respond to growth.

Q: Is it possible to remove your digital fingerprint online? I've heard there are agencies that can remove all your online history/mentions/ID.

A: It is much harder. There are many types of digital fingerprints like browser fingerprint, device fingerprint, camera fingerprint, social media fingerprint, etc. Removing all of them is much harder, if not impossible.

Q: Are you able to study ballistics forensics at UTS?

A: This topic is covered as part of the Criminalistics subject in our Bachelor of Forensic Science.

Q: What different forensic careers does the AFP offer?

A: The Australian Federal Police offer challenging career opportunities promoting diversity and inclusion across the Forensic Disciplines; including: Crime Scenes; Fingerprints, Biology; Chemical Criminalistics; Facial Identification; Forensic Drug Intelligence; Forensic Intelligence; Forensic Quality; Strategy, Performance and Innovation; Laboratories and Logistics; Forensic Training Team; Firearms Identification and Armoury Team; Forensic Operational Centre, Forensic Exhibit Register.

Q: What advice would you give to a forensic science student?

A:
Claude: Complete your all-round education in forensic science. If possible, pursue an Honours degree in forensic science or undertake a relevant research project. Expose yourself to the wide range of sub-disciplines and make sure you understand the fundamental forensic science philosophy and concepts before specialising. Engage with practitioners, researchers and the industry. Become a member of your local Forensic Science Society so you can meet people. Do not hesitate to get involved in small tasks and projects as a start.

Xanthe: Take advantage of opportunities to connect with the forensic science community. This may be through events, professional societies such as the Australian and New Zealand Forensic Science Society, or educational opportunities. Consider getting your hands dirty with some research. A core aspect of being a professional forensic scientist is being able to think critically, communicate, and learn - skills that are crucial for a short research project or Honours. Be ethical and honest. Lastly,

persevere with job applications. Don't be afraid of feedback - learn how to use it to improve.

Q: A quick question for Sarah. How did you get into forensic science? And where did you study?

A: My passion for Forensics first kicked off in year 10 when two NSW Police officers came to our class to speak about forensic science. From that point in time, I knew what I wanted to do and that was to help police solve crime and serve the community. I studied a Bachelor of Science (Honours) in Applied Chemistry-Forensic Science at the University of Technology, Sydney.

Q: Hi, I am in Year 10 and I would like to know the different jobs in Forensics.

A: There are a huge range of careers in forensics, such as crime scene officer, DNA profiler, forensic laboratory scientist, biomedical scientist, expert witness, forensic trace evidence specialist, analytical chemist, science teacher, lecturer or academic, clinical toxicologist, forensic toxicologist, regulatory toxicologist, forensic entomologist, team leader in investigations, forensic chemist, forensic anthropologist, research associate, analytical technician.

Q: Sarah or Xanthe, have you have any challenges in your forensic science career?

A:
Xanthe: I've been very lucky to have spent my career working within the bubble of a supportive team. Staying within academia has definitely had its challenges - competing for fellowships, grant funding and a permanent job isn't easy - and in some ways I've almost been trapped between two worlds. STEM disciplines in academia are still largely male-dominated and, while things are changing for the better, there are still cultural remnants of a less diverse academy. Forensic science is unusual because we're now one of the few female-dominated scientific disciplines; something which has shifted rapidly since I started my studies 17 years ago.