# Biometrics, the face of new capability

It's new and it's evolving but the launch of the AFP Facial Recognition System is a significant moment for the organisation.

Federal Bureau of Investigation (FBI) Senior Level Photographic Technologist Dr Richard Vorder Bruegge says it was supposed to be the perfect crime. More than 400 valid US names and social security numbers had been stolen from legitimate foreign nationals with temporary US work visas. The 400 workers were hired to staff a temporary factory in the Pacific, so they would never set foot on mainland US. When they returned home there was no-one to complain about the multimillion dollars in mounting fraud committed against their names.

A breakthrough came when the FBI approached the Department of Motor Vehicles of one its partner state agencies to use its photo database. When a search of the most often abused social security numbers was entered into the database there was a return of more than 14,700 candidates. As Dr Vorder Bruegge says, that's 14,700 crimes in one database in one state. One candidate alone had 11 identities. When probe images of suspected criminals involved in the network were run against that list of 14,700 faces the FBI then had 36 prime suspects to pursue.

Dr Vorder Bruegge is a leading expert in facial recognition and facial identification science. The distinction between 'recognition' and 'identification' is significant and represents the two sides of the science. On the one hand, facial recognition refers to the automated recognition of measurable facial characteristics (biometrics) that are unique to an individual. Facial identification is the human forensic science of processing those automated results into an identification that can support a prosecution in front of a judge.

Dr Vorder Bruegge was invited to lead a two-day conference hosted by the AFP Forensic and Data Centres portfolio during a visit to Australia in June. He admits that the full capability of biometric facial recognition and forensic facial identification is not quite at the fictional level of CSI television franchises. He stresses that the science will still be in development when those now practising it have retired. But real developments of the technology are taking the science out of the realms of fiction and solving real crime.

AFP member Jason Prince demonstrates the AFP Facial Recognition system.

The operational rollout of the AFP Facial Recognition System to the AFP Net in February is already producing results. In more than one investigation since February, witnesses to an offence have described an alleged offender to an AFP forensic artist. The forensic artist then pieced the description into a composite facial image. When that image was searched against the facial recognition database it presented a number of candidates that ultimately led to the identification of offenders in those matters.

Coordinator AFP Forensic and Data Centres Biometrics Dr Simon Walsh says the launch of the AFP Facial Recognition System is a significant moment. He says the way people are identified is changing and will continue to evolve; to rely more on biometrics, which has typically meant fingerprints and more recently DNA. Biometric facial recognition and potentially voice and even iris and other modalities will be included to that.

"This really is recognition that identification can occur with the assistance of biometric technologies and that is something that – once it changes – will

never change back. It will be our future in terms of identification management in the AFP," Dr Walsh says.

The monumental potential of biometric face recognition has been known for years. But the software technology to support real-time police operations has only really been good enough in the last two or so years. The FBI itself is leading the world in this technology and it only stood up its Biometric Centre of Excellence in 2009.

The capability can be applied for multiple uses from access control, automated identity verification and human identification to surveillance and law enforcement and national security investigations. But the potential of biometric facial recognition to support investigations continues to grow as the technology advances.

One example cited by Dr Vorder Bruegge was the footage tracking the movements of the 2005 London bombers. The sequential movements of the bombers' respective paths were painstakingly pieced together by human beings from closed circuit television footage. New biometric cluster technology and software now in use will, first of all, be able to identify a human face in a given piece of video footage. Once identified, the probe image will automatically search that face against a database or nominated databases. It can then automatically search and match subsequent video footage using candidates found in the first piece of video footage.

Dr Walsh says the AFP is presently evaluating a system that will potentially support the identification of faces from video material that would be used in support areas such as surveillance and protection activities. The technology obviously has a role to play in screening large amounts of video footage for identifying people in crowds or child exploitation in an online environment.

"The AFP system will primarily be used to store photographs of people taken while in AFP custody and then it will be capable of searching that database using those images. Other images might come from a range of different investigative areas but the objective would be to try and link an identity with a probe image."

"The main thing is, it is an additional capability for investigators and intelligence. It's new and it's evolving. It's got a long way to go but it has fantastic potential."