ECU, DVI and CSI - a tale of three letter acronyms

Tsunamis, earthquakes, plane crashes, terrorist bombings, massacres all have at least two things in common they are normally disastrous and they usually contain unidentified human victims. The task of reconciling these human remains is more commonly referred to as DVI or Disaster Victim Identification and often very expensive, prolonged, arduous and dangerous work.

Professor Craig Valli, Reino Karvinen and Chris Holme from the School of Computer and Security Science (SCSS) are working with Queensland Health Pathologist Professor Peter Ellis and Griffith University Forensic Dentist Associate Professor Alex Forrest to produce a radio frequency identification (RFID) based information system to expedite processing of disaster victim identification. The research work being undertaken is part of a $1.2 million total value grant in the Australian Future Forensic Innovation Network (AFFIN) program run from Queensland.

The program was initiated through contact from Peter Ellis who was one of the leading pathologists in the 2004 Thailand tsunami. Peter saw French teams trialling the use of very rudimentary RFID technology to try and track bodies and body parts that were being examined. The technology used was similar to current pellet based technology used to track household pets. Through the secau engagement with law enforcement there was knowledge that ECU had developing expertise in the area of RFID and forensics and Peter contacted SCSS in 2007 on this basis.

The initial system has evolved from expertise initially gained in the now patented FoxTrakka/CowTrakka system that has been developed by SCSS. The current research essentially aims to replace the cliche toe tag with an RFID enabled tag that can store autopsy information, medical records, interview notes and other relevant documents and artefacts for the autopsy.

The research has been challenging as many of the environments in which these final systems work will be conducted in present unique challenges some of which are not immediately obvious. One of the biggest challenges is tuning the antenna on the tags to be working in temperature ranges of -30°C up to 60°C. The other is providing low-power systems that can be sustained for up to 18 months or longer without data loss for the tags until the bodies themselves are reconciled and released. With this system now considering the whole mortuary supply chain other challenges are now being overcome. This includes for instance sourcing power sources that upon incineration will not turn into high-speed deadly projectiles or ones that will produce highly toxic fumes. Many modern mortuary systems and processes now include the use of CAT and MRI scans to perform non-invasive autopsies, the high energy that these systems produce has significant issues for some of the circuitry and semiconductors used in these tags.

There are already several patents in the pipeline that have come out of the initial systems designs and bench based experiments and should produce commercialisable products. The primary objective has never been far from all of our minds when producing the system and that is the development of a system in hands through IT that will allow a more efficient reconciliation of bodies so that grieving relatives and friends can get on with the process of living.