



## ARTIFICIAL INTELLIGENCE

A FAMOUS philosopher once penned - prevention is better than cure. Some argue this is not always the case but when it comes to CCTV for public area safety and critical infrastructure protection, prevention is definitely better. However, studies are showing that an alarming number of CCTV systems are delivering nothing more than retrospective evidence rather than prevention.

A study completed by the UK Home Office in 2002 saw researcher compile data from individual evaluations of 22 public safety camera systems throughout North America and the UK - 50 per cent of the sites revealed a decrease in crime, whereas nearly 25 per cent of the sites showed an increase in crime. Incredibly, the study revealed that not one of the CCTV systems had any impact on violent crimes.

Here in Australia, a study conducted for the NSW Crime Prevention Division of Australia in 2001, concluded CCTV was ineffective as a crime prevention tool. In another local report released by the Australian Institute of Criminology in January 2004, it was concluded, "CCTV will not work by itself."

Using CCTV for crime prevention requires an operator viewing video surveillance monitors for the purpose of identifying an event, reporting it and requesting immediate response to the scene. The ability to deploy preventative action hinges on several factors, all of which are irrelevant if the operator misses the incident.

The problem highlighted here is that humans are prone to distraction when performing repetitive, mundane tasks. Studies have shown that a human operator, viewing two or more monitors, will become distracted and miss vital detail within a very short period of time.

To combat this, software vendors are offering auditing systems which run in the background to mine data with the purpose of critiquing video operator effectiveness. This type of system is costly to setup and time consuming to manage.

On the other hand, imagine a control room with a video operator that never gets distracted while

In this article we consider the fact that for CCTV systems to be effective they must be monitored and incidents viewed must illicit a response. Local and international studies show that when used merely as a deterrent CCTV does not reduce violent crime. For smaller sites and end users with limited budgets the answer is artificial intelligence.

continually scanning all the video from any number of cameras, immediately alerting operators to events with over 90 per cent accuracy. This operator never stops working - doesn't need sleep, lunch or coffee. You might say that's impossible, and it is - for a human.

AI researchers have created an artificially intelligent system called video analytics - a software application that uses complex algorithms to replicate the way a human views surveillance video. While video analytics does not replicate human intelligence, (as duplicating the brain's synapse connections alone makes this impossible), it successfully replicates the lateral way humans think.

Video analytic software can detect a range of behaviours and events that are deemed unusual or suspicious, such as someone falling down, spraying graffiti on a wall or loitering in a sensitive area. It is commonly used in outdoor applications such as perimeter intrusion detection, where video motion detection just doesn't cut it. The software raises an alarm in whatever it understands as being an unusual event.

But how does the software achieve this kind of outcome? Video analytic designers program the software to view a scene similar to the way a human would see it - modelling the logical thinking process a human uses to recognise and alert users to a particular situation or object.

The software platform is quite remarkable in that it can detect and alert users to multiple events simultaneously. For example, it can be programmed to alert if it 'sees' someone falling and alert if there is an act of vandalism and alert if someone has parked illegally - even if all these events occur at the same time in different areas of the scene - the video analytics software will accurately detect and alert, no matter how busy or crowded the scene may be.

Video analytics systems can also 'see' what would be invisible to the human eye. In a live demonstration shown recently, AI software picked out a black briefcase that had been left on a black marble floor in a critical site in Canberra. Looking at the live video feed, the briefcase appeared totally

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