

Word on the street



The Intelligent Moving Camera system devised by Viseum knows at any one time where all objects are in its field of view, what those objects are, where they have been and intelligently predicts what they are about to do... The system then locks onto (and homes-in on) a particular incident, the motion of that incident controlling the PTZ camera and providing fully automated close-up surveillance. Stuart Thompson evaluates a major breakthrough for local authority CCTV installation projects. Photographs courtesy of Viseum (UK)

IN TODAY'S CLIMATE OF HEIGHTENED security, there's a pressing need to bolster the effectiveness of CCTV. The increasing cost of 'clearing up' yet more crime - not to mention the detritus left behind following innumerable acts of anti-social behaviour - allied to the considerable ongoing operational expense of CCTV surveillance necessarily makes this a difficult task. The high costs of staffing (and of the monitoring and communications infrastructures) means that local authorities need 'more bang for their buck' when tackling crime than ever before.

With the help of the Department of Trade and Industry (DTI), who generously offered the maximum DTI SMART Award, the team at Viseum (UK) decided to help local authorities by first identifying the problems associated with current surveillance regimes, and then offering a workable solution.

Consider, for a moment, the instance when a moving camera's historical video is reviewed to find evidence of an incident that was not reported until after it had happened. Having searched through hours of video, the typical 'result' is to find no evidence at all because the camera was pointing the wrong way!

Studies have consistently shown that, given the relatively small number of operators in comparison to the ever-increasing number of moving cameras, CCTV operators can only monitor and move 20% of their network of cameras effectively at any given time. Monitoring efforts must therefore be focused on those areas known to produce the most

crime. In turn, this means that operator resources cannot be spared to effectively monitor the many cameras covering areas where unpredictable crime occurs.

Left to their own devices

It follows that most moving cameras are either left static, looking at absolutely nothing, or are left 'running' on pre-set tours which allow them to look at different places but still record nothing in particular. Potential wrong-doers often assume that these are 'dummy' cameras, and that they're just not being watched. This has significantly reduced the original deterrent effect that CCTV networks enjoyed when they were newly installed.

This means that, in wider areas random and unpredictable crimes will continue to pass by unnoticed (and thus remain a threat).



At present, the areas protected by local authority CCTV systems are predominantly town centres - both at their heart and their periphery. However, there are many other populated areas within a given local authority's jurisdiction which do not fall under the scope of town centre surveillance.

Furthermore, there is evidence to suggest that CCTV displaces a proportion of crime and youth disorder to these areas. They then become a casualty of the few premium areas fortunate enough to enjoy protection. This has aggravated the problem of random crime in the wider areas. It's apparent that crimes in these locations can be no less serious than those committed where CCTV is in operation.

One attempt to protect more areas while meeting budgetary constraints has witnessed the use of CCTV systems which can then be re-deployed to different places. However, in practice these re-deployable systems have shortcomings which discourage users from actually re-deploying them. In particular, they need to be manually operated and, as a result, require mobile remote communications which can be more costly to set up and use.

If crime does move on, users often leave these systems at their original installation, but no longer even try to allot time to monitor them. Alternatively, they may take them down and store them. Either way, the benefits offered by the re-deployable systems are lost.

To discourage the prevalence of youth disorder and anti-social behaviour 'hot spots', it's obvious that a long-term crime deterrent is

necessary. This requires two main elements – to achieve (and publicise) consistent crime clear-up, and to ensure that moving cameras are seen to be constantly reacting to events. This – in tandem with the problems identified by the nationwide survey – led to a software solution providing intelligently automated moving camera surveillance, described here as intelligent moving cameras (IMC).

Improving operations, saving money

By way of improving operations and saving money, the solution also had to:

- detect incidents and react by moving a given camera accurately day and night, through all weather conditions;

- consistently capture close-up evidence of its own volition;
- be easy to install, use and rapidly re-deploy.

Teams of developers around the world have attempted to produce effective IMC technologies but, in every case, after several years of development they've failed to overcome the myriad of technical obstacles in their way. In fact, prior to supporting our own research and development, the DTI initially declared it would be "impossible"...

Many fixed video content analysis technologies are available, but at best these only alert the already very busy operator to particular and complex niche scenarios. These should not be confused with true IMC systems

providing the active functionalities end users need, and which can be relied upon to collect close-up evidence.

Once development of the IMC solution was complete it was then time to test it 'live'. Various product models incorporating the new software were trialled under rigorous conditions with numerous local authorities, including Luton Borough Council (see panel 'Like-for-like: Luton Borough Council puts IMC technology through its paces'), Bexley Borough Council and Chester City Council (where Viseum is working in conjunction with BT redcare on a dual alarm signalling and CCTV project). Areas suffering the most from acts of random crime were chosen, and a like-for-like comparison undertaken between the IMCs and the existing (and for the most part extremely costly) operator-monitored infrastructure.

Watching me, watching you...

Put simply, the trial results were outstanding. Every crime reported had been captured by the IMCs and their close-up evidence was used on all occasions. However, nothing had been captured by the operator-monitored infrastructure. In one particular installation, the IMC even captured evidence of a crime that hadn't been reported.

In another installation, it caught evidence of several unreported misdemeanours which the Council then acted upon.

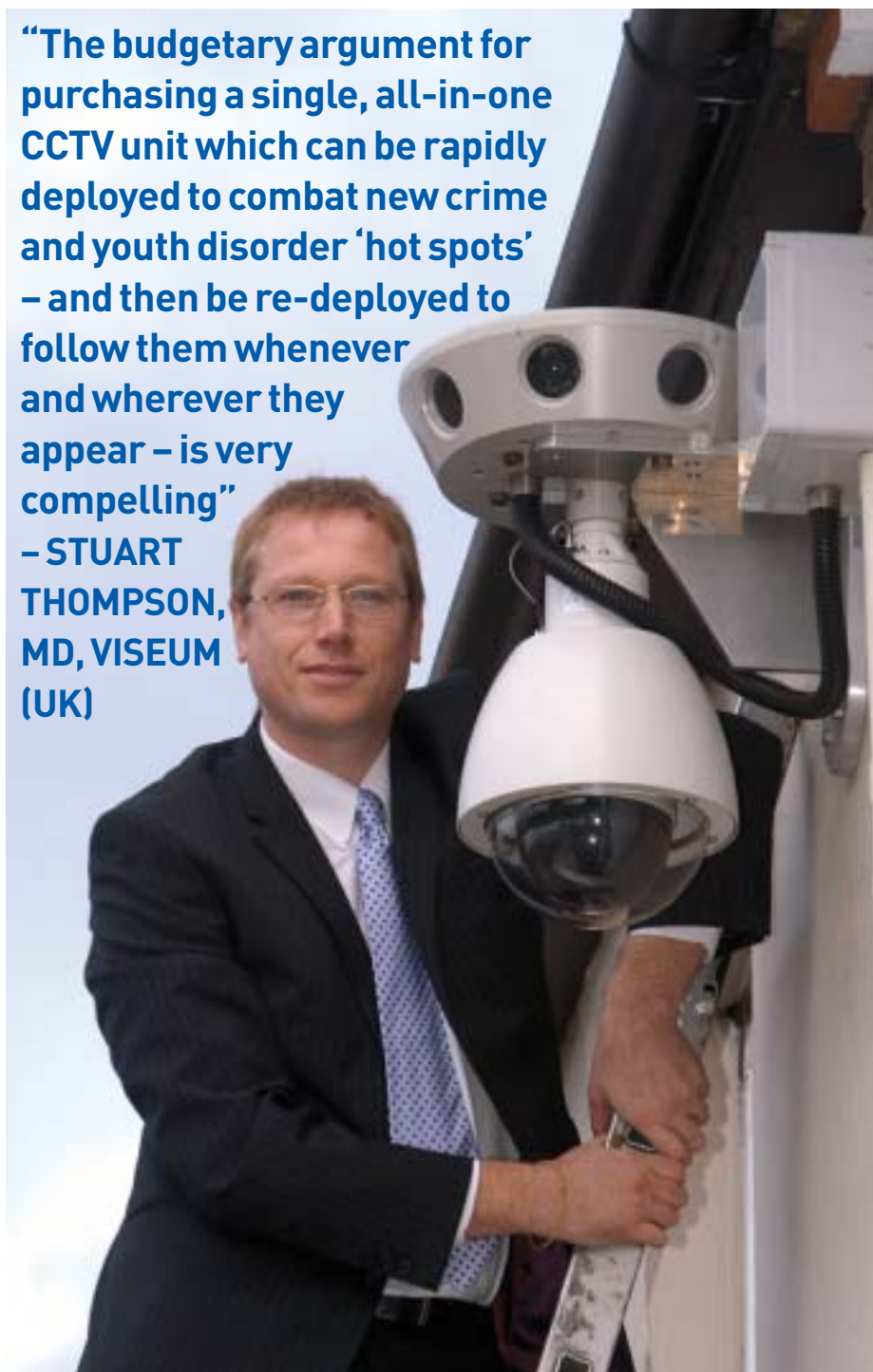
Intelligence was provided to the local police concerning a potential drug dealer. This sent out strong deterrent messages to would-be criminals and, eventually, the local authority concerned even relied on it as a management tool to ensure that staff were maintaining certain areas in the right way. Throughout all of the IMC trials, the deterrent effect was both highly noticeable and proven by the drop in crime incidents.

In the past, some law-abiding individuals have been concerned by the possibility that they could be watched by others. However, in practice, where IMC technology has been deployed to protect communities suffering from crime, the noticeable reduction in crime and anti-social behaviour has led members of the public to comment that the criminals cannot avoid being watched, whereas people going about their daily business have nothing to hide. Once people have understood the way in which evidence is used, they realise that if they haven't done anything wrong, they'll probably never actually be watched by anyone.

The trials proved that there are many situations where it's no longer necessary for operators to constantly monitor cameras and control them in order to catch criminals in the act. If time and budget allow, operators can take control of the IMC seamlessly and whenever they wish, but when it's left unattended it will continue to monitor the area effectively and capture the crime.

Indeed, the trials also highlighted many additional end user benefits to be realised from IMC technology. For a start, it provides long range 'line of sight' surveillance, recognising events that are too distant for the naked eye to see. IMC technology can also closely watch

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– STUART THOMPSON, MD, VISEUM (UK)





Acid test: the aftermath of integration at Luton's CCTV Control Centre

DECEMBER 2006: AS A RESULT OF THE impressive trial performance (see below), Luton Borough Council decided to benefit fully from intelligent automation by having the Viseum-driven camera system integrated within its CCTV Control Room. The 'operator only' camera was disconnected, writes Brian Sims.

Within the first three weeks of this upgrade, Viseum's Virtual Operator enabled the CCTV Control Room to record close-up evidence (that would probably never have been captured during standard

operation) of an individual who was under an ASBO injunction not to enter the area.

In January, evidence was gathered by the Council and used to prove that the grounds of Hockwell Ring Estate (pictured) were cleaned first thing every morning. The local Council's Housing Department is so confident of the system that its managers relied on its evidence to confirm whether the entire area had been properly cleaned by the relevant staff.

The trials demonstrated in their first year that the Viseum system caught crucial evidence on all reported incidents and also on several unreported ones, but that the manned CCTV infrastructure did not record any evidence. ■

multiple events in different directions at the same time, while providing extended evidence complete with overview and close-up recordings. IMC technology functions with hardware already in widespread general use and can – if required by the end user – raise an alert in response to specific kinds of criminal and/or anti-social behaviour.

IMC systems: the bottom line

For end users to realise the maximum benefit from past investments in 'manned' CCTV, there's a strong case for integrating IMC technology with CCTV Control Rooms. By improving staff-operated PTZ cameras, end user organisations can then effectively – and consistently – monitor more moving cameras.

The budgetary argument for purchasing a single, all-in-one CCTV unit which can be

rapidly deployed to combat new crime and youth disorder 'hot spots' – and then be re-deployed to follow them whenever and wherever they appear – is extremely compelling. With re-deployable CCTV units using IMC technology for post-crime video retrieval, there's no need to use remote communications at all.

The communications needed to respond to IMC alerts are much less expensive than constant monitoring. IMC re-deployable systems are far easier to manage, making re-deployment both rapid and cost-effective.

The security industry is usually one of the last to embrace new technology. With it comes the fear of redundancy. However, it's well known that, statistically, the UK's monitoring infrastructure doesn't have enough operators available for the number of cameras now

installed. The security industry's consultants are swiftly beginning to realise the need for investment in proven technology.

IMC technology will constantly and automatically monitor any given area day and night in order to capture evidence of what it has been instructed to look for. It can also be told to look for different things at certain times of the day or week.

Camera sites may either be left completely alone to manage themselves or may be used pro-actively at certain times depending on the operators' local knowledge.

Once operators and management realise these capabilities, a new understanding of the 'man and machine' relationship will emerge. ■

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Like-for-like: Luton Borough Council puts IMC technology through its paces

LUTON BOROUGH COUNCIL'S TOWN centre surveillance scheme covers the Market Square, the High Town area, Bury Park and the residential Hockwell Ring Estate. Although the existing 'manned' CCTV infrastructure has been very successful – with something in the region of 7,000 arrests attributable to it – like any other local authority the Council wants to keep costs down, writes Brian Sims.

Keen to see how Viseum would work 'in situ', the Council duly agreed to a trial period during which time a like-for-like comparison test would be conducted between a Viseum-driven camera system and the Council's existing infrastructure.

The Viseum-driven system was initially used as a stand-alone system and accessed to download evidence over a Broadband Internet connection. Evidence captured in stand-alone mode was as follows:

- July 2005: a youth – accompanied by two other youths – broke in and vandalised a first floor flat, by climbing up the balcony... Viseum evidence used to caution all three;

- August 2005: Viseum provided local police with intelligence information on a drug dealer and the premises being used;
- May 2005-January 2006: there were several incidents of members of the community urinating in public areas... one particular perpetrator was well known to the Council and was subsequently sent an eviction notice;
- October 2005: three youths broke in



though the front entrance of a high rise block of flats... Viseum-based evidence identified two of the suspects and showed they did not remove anything from the premises;

• December 2005: Viseum captured crucial evidence on a suspect who committed an assault... the suspect was reported wearing brown casual trousers, but the Viseum evidence showed that these were in fact brown corduroys. The IMC captured the suspect on two occasions within one hour, and police were able to piece together a complete sequence of events – how he arrived, where he came from and where he left to go to.

- January 2006: Viseum identified a resident breaking into the front door of another high rise block entrance. He claimed that he had forgotten his keys... and was subsequently evicted.
- March 2006: the Council was able to retrieve the major costs of clearing up a paint spillage because the Viseum camera identified the perpetrators;
- June 2006: a known drug dealer broke into another drug dealer's flat on the first floor to vandalise it... the Viseum evidence showed the police how he broke in. ■