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CCTV Control Rooms: Improving Operator Performance

In the UK CPNI's Best Practice Guide for Human Factors in CCTV Control Rooms (2014), it is highlighted that "organisations which operate CCTV control rooms often focus on the technical or equipment requirements of the room" - ahead of the equally important 'human factor' within the CCTV system. The guide outlines various approaches to improved user-centred design.

Snap Surveillance has developed video surveillance software that uniquely addresses this dimension of CCTV design and implementation. As a consequence, Snap's technology offers a significant enhancement to both **TRACKING** of threats and persons of interest within a monitored space, and **RESPONDING** to threats and incidents more effectively.

The Problem

Numerous security industry consultants and researchers have discussed the limitations of the human operator in coping with the various demands of video surveillance – including vigilance decrement (waning attention), fatigue, loss of spatial or situational awareness, and dynamic demands from underload to overload. The issue grows as CCTV networks become large, as found by Keval (2006) that "many of the operators complained that there were 'too many cameras to cope with'".

These limitations are compounded in sites where the CCTV systems are large and complex, the scenes are busy, and the operators cannot be reasonably expected to recall all camera locations and relative positioning. At best this often results in a loss of situation awareness, which "can rapidly lead to inaccurate assumptions, decisions and errors of action – with potentially negative consequences" (per CPNI Best Practice Guide). In a live situation – in particular an emergency – the risk of overload and lost awareness escalates – "staff are likely to be suffering from fatigue and stress and there may be high levels of anxiety which can affect how well people take in information and make decisions".

"Overloading an operator with too much information, particularly during critical tasks, should be avoided" (CPNI – Human Factors Guide)

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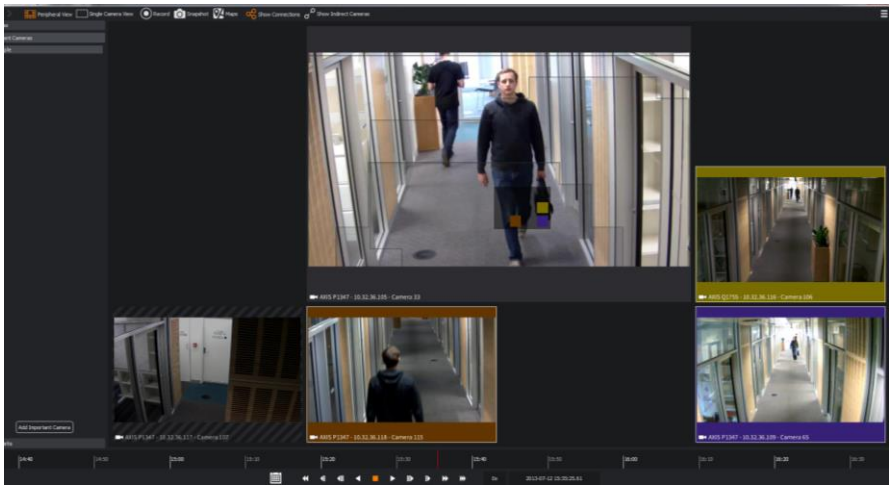
Snap FMx – Helping Provide a Solution

The current best practice in helping deal with the problem above is to utilise well maintained maps to provide CCTV operators with a guide on camera positions, names and numbers. This approach will be inherently limited, as operators are required to maintain awareness of both the video being monitored and also the map location – and to be constantly seeking out the next camera views by cross referencing, needing to maintain both situational and spatial awareness.

Snap addresses this by removing the reliance on a map, instead constantly showing the operator "where to look next" with live video feeds of the cameras known to be related to the current camera view of interest. This makes it simple and intuitive for an operator to follow a subject from camera to camera within a large network, always seeing the next available camera views and being able to reliably switch from one to another.



Sample Snap FMx automated video view, showing primary camera with other related cameras, and overlaps- highlighted in colour to aid operator.

Snap's ability to do this is based on our patented technology for learning a camera network – we integrate with the Video Management System (VMS), and "watch" the camera feeds, automatically learning the camera relationships (how each camera overlaps or neighbours other cameras). Based on this learning, the software then generates "peripheral vision" views for the operator that show them next available cameras, and guide them on following a subject – even in crowded scenes. This provides for simpler and more reliable live tracking, and significantly faster and more efficient incident review from recorded video.

Integration with other security technologies

There are numerous outstanding technologies for threat screening and for initial detection of suspicious activity, some of which will be vital to the CPD. These range from physical scanners to a variety of video-based technologies including video analytics and facial recognition.

Snap *complements these technologies* by providing an operator-centric interface for helping to quickly and intuitively TRACK a subject through a large CCTV network once they have been identified as suspicious. The ability to reliably maintain a track – and also to find a subject in recent timeline and "catch up to live" may also help RESPOND to an incident – knowing current location of a threat.

Snap is not an automated tracker – such automation concepts do not lend themselves to crowded places or to live tracking. Rather, Snap is a visual tool for the operator to aid them in pursuing a subject through video, built on an automated learning engine which understands the camera relationships within the system.