



Caught On Camera: Analyzing the Data

Video analytics make it easier to make sense of miles and miles of video footage.

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In an increasingly security conscious world, the number of video cameras recording what's going on in their vicinity every day has increased exponentially. In England there are more than 4.2 million cameras in public places, according to a Surveillance Studies Network report. And there are more than 5.1 million surveillance cameras at work in the U.S. according to Dilip Sarangan, industry analyst for Frost & Sullivan. The number of cameras worldwide will only continue to grow (see sidebar).

These cameras collect and store millions of bits of information. However, it is the analysis of that information that makes it useful, says Mike Fabbri, director of data solutions operations, Motorola. Intelligence is what makes it possible to utilize all of the relevant data that's been collected. It can also be used to specify what, and what not, to collect.

While there are already millions of cameras in operation, new content is being created every day as city, state and national governments deploy more and more video surveillance cameras. The cameras are put in place to increase homeland security,

reduce or deter crime in high crime areas, or improve public safety locally, statewide or nationwide.

Mobile video cameras are also increasingly being installed on public transportation and public safety vehicles. Not only do these cameras improve safety by enabling public safety officials to see what is going on inside and outside these places, but they also offer a strong return on investment from a training and liability perspective.

One emerging trend is the desire to aggregate and pool public and private video assets across a city, state or the entire country during bomb threats, school shootings, chemical spills or life threatening storms such as hurricanes and tornados. These are all instances during which video from multiple cameras would be of great help to the public and first responders.

“For instance, in the event of a life-threatening incident, an emergency operation center could drastically improve decision making if it had immediate access to the live video being shot by a surveillance camera system at a bank or school where the incident is taking place,” says Fabbri.

There are several challenges to overcome before use of multiple cameras belonging to multiple parties becomes a widespread reality. First, many cameras in use today are analog and cannot, without upgrades that can sometimes be significant, be connected to the IP-cloud from which digital based cameras can be accessed. Also, back office video management systems require technical interfaces that enable them to control third-party cameras. In addition, the parties involved in video sharing would have to hammer out agreements between each other. Last, but not least, is the need for a process for choosing, assembling and transporting/pooling the video that would be the most helpful to first responders.

“The use of video, specifically mobile video, is going to change policing. Officers arriving on a scene where shots have been fired could get a real-time visual of the scene, or even the perpetrator, before they arrive,” says Fabbri. “Real-time access to live video surveillance dramatically increases a police officer’s situational awareness, making them less reliant on potentially less reliable third party information or reluctant witnesses. It can also help them identify eye witnesses.”

Rules To Solve Crime By

The use of analytics is another growing trend. The beauty of video analytics is that people can employ simple rules to discover if something the camera sees is different or if something is happening that indicates there is a potential crime taking place. For instance, cameras located in high crime areas can be programmed to alert law enforcement officials when 20 or more people have congregated in a particular place

that's under surveillance, or when a car pulls up to a particular area and someone goes to the window to hand over a suspicious package and the car pulls away.

Cameras also can notify a port authority officer if a car has been parked in an unauthorized spot for more than a couple of minutes, or if the same red van has gone around the block of the landmark building for the fifth, seventh, or tenth time.

"The cameras use video analytics to look for mundane things that a person might miss. The analytics can then trigger proactive alarms or other rules and tell cameras to start making a permanent recording," says Fabbri.

Video analytics programs also provide officials with a forensic capability. Rather than poring over hours and hours of raw video footage, the use of analytics can improve the efficiency of searching recorded video by "tagging" the video with pre-specified tags that identify things such as colors, the number of people in view, shapes, etc.

This metadata can then be searched after the fact much more easily than the raw data. For instance, someone looking for a person wearing a red jacket would not need to look through all the video that has been collected to find that person. The analytic software helps perform this task automatically.

Collecting metadata on the video content is key because video cameras do not "know" anything about the content they have recorded apart from the time and date it was taken.

Easy Does It

Analytics has existed for some time, but in a relatively focused arena. It started in perimeter surveillance, i.e. cameras watching fences or alerting security guards charged with watching multiple monitors, or opening another lane when, for example, in a retail store there were more than five people in line.

The technology has become more sophisticated over time, and progress is being made every day. However, it is still important to make sure the technology will fit the solution. As an example, facial recognition can work really well in a place like an ATM where the camera and software can get a good look at the person for more than a few seconds.

Still today, simple rules yield great results. For instance, video cameras in a police car automatically start recording when the officer hits his siren and lights or when the cruiser door is opened. A video record is taken every time something important is happening and the officer doesn't have to stop and make sure to press the record button.

Conclusion

Motorola is taking a leadership position by both developing solutions and working with an ecosystem of third-party software applications to deliver a broad range of wireless video solutions for customers.

“We can help our customers understand how to architect and implement an end-to-end wireless video surveillance solution, including analytics, multiple camera access and often full-motion mobility,” says Fabbri.

As video surveillance cameras are networked with each other and as video analytics matures, people using this technology will gain an increasingly better view of what’s going on around them in real-time or the recent past.

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