Putting Intelligent Video to the Test

Intelligent video analytics have long been hyped, with false alarms resulting in bitter disappointment. *A&S* partners with VideoControlRoom to test vendor claims in our Intelligent Video Shootout.

SUBMITTED BY VIDEOCONTROLROOM

Smart video is an emerging technology that will play an important part in digital video systems. However, it remains unclear when it will become mainstream and which vendors are ready for broader adoption.

Today, video surveillance systems are largely passive, providing an important evidence-gathering medium for a host of applications. The bright future for video surveillance is intelligent edge devices recognizing events as they unfold. The system would alert management, so issues can be addressed in real time. It would also derive data from the scene and make footage easier to search

As surveillance becomes pro-active instead of reactive, customers will find it more powerful and valuable. It also presents an opportunity for security companies to profit from management solutions delivery.

Three advantages of intelligent video are:

1. *Alerting on events in real time*
   Examples include moved object detection, placed object detection, driving the wrong way, flagging a suspect (facial) or opening a gate (ALPR).
   Why this matters: At the moment, monitoring personnel can only go back after an event, unless they are lucky enough to be watching it happen.
2. *Gathering data*
   Examples include people counting, vehicle counting and retail behavior analysis.
   Why this matters: These activities would otherwise require expensive equipment or significant manpower to collate.
3. *Google-izing video systems*
   Examples include the ability to search for different kinds of events, such as someone picking up protected stock.
   Why this matters: At the moment, owning a video system is like having access to the Internet, but without a search engine. It takes time to search recorded video, which will only get harder as megapixel cameras and remote management grow.

▲ The Intelligent Video Shootout will test for abandoned object detection.

So if intelligent video is the future, where do you start and with whom? Even though VideoControlRoom Australia has deployed intelligent video for years, its cost and complexity limits it to top end users with big budgets.

VideoControlRoom looked for mass-market smart video at SecuTech Expo in Taiwan, identifying about 20

▲ Test criteria include removal of protected assets.

vendors with intelligent video products. Michael Brown, MD of VideoControlRoom, said, "Twenty is a big list of vendors. It represents a serious challenge to evaluate all the product offerings for commercially viable solutions."

VideoControlRoom runs one of Australia's leading video services business, using smart video for intrusion detection at high security sites. "We have learned much through the commercial deployment of intelligent video," Brown said. "To be effective, it has to be able to tune out false alerts and be easy for staff to program. Accuracy aside, it's not just the upfront cost of the technology, it's the ongoing cost of managing the technology that dictates commercial viability."

Finding real-world solutions is one of the company's goals. "We are interested to learn, like many A&S readers, how smart video is going to make the leap from being a top-end technology to the day-to-day business," Brown said. "These potential customers possess a much smaller security budget and lack the in-house skills to manage complex technology."

VIDEO SERVICES

The role of video services depends on who will program the system. Three different people will program smart video.

1. *Remote video services*
   A commercial control room remotely monitors the customer's video system to deliver services, such as remote video verification
2. *In-house security*
   This would be on-site personnel watching CMS, such as at airports or parking lots.
3. *Customer*
   These individuals include managers, operations staff or IT staff.

The closer programming gets to the end customer, the more it requires a simple and elegant user interface. Since most intelligent video systems are not that mature, video services will play a significant role in commercializing smart video.

In large installations such as airports and prisons, full-time staff are employed to watch cameras. However, the average retail shop cannot afford someone trained in video systems to get the most out of smart video. Smaller businesses want the system to be intelligent enough to notify them when a true event has taken place.

With video services, the client pays trained professionals to program and respond to smart video alerts. The user obtains the benefits of intelligent video at a fraction of the implementation and maintenance costs.

Even as smart video moves to everyday business, video services will continue to play an important role. Customers will rely on video services to perform higher level functions, such as data collation and analysis. The service provider will be there 24-7 to deal with mission critical alerts from the smart video system and provide system health monitoring.

VideoControlRoom has a vested interest in helping the industry move smart video along. Its partnership with A&S offers honest and unambiguous evaluation at its labs. As an R&D company, it does not sell products but solutions to clients.

VideoControlRoom hopes to increase security's understanding of intelligent video commercialization. It is not just for systems integrators, but also the manufacturers and code writers. OEM providers have the ability to move intelligent video forward to the tipping point, producing technology that is practical.

REALISTIC INTELLIGENT VIDEO

Of the thousands of video systems installed daily, only a tiny percentage includes intelligent video. To be a realistic proposition, smart video needs to accurately

alert, gather and Google-ize.

It needs to be programmable without a degree in rocket science. Key parameters must cut out noise, which would otherwise diminish the output. Settings like "minimum object size" and "top speed threshold" prevent false alarms, such as birds moving quickly near the camera.

Brown explained the rationale behind the smart video tests. "The things we'll be testing for represent problems the customer wants solved, at a price they are willing to pay. Also we think these tasks should be readily achievable by many vendors with current technology — none are unrealistic and many vendors' products will do these jobs. However we'll look to find out how well and at what programming and management overhead."

▲ Intelligent analytics will be evaluated for driving the wrong way and traffic control.

To verify vendor claims, all intelligent video solutions will undergo the following tests.

1. **Abandoned Object Detection**
   This demonstrates outdoor placed objects, such as an abandoned bag at an airport or objects left in a fire exit hallway.
2. **Removal of Protected Asset**
   An indoor object will be removed, to demonstrate the ability to protect high value assets from being moved without authorization.
3. **Driving the Wrong Way, Traffic Control**
   This will measure object detection in an outdoor and the direction it moved in.
4. **Outdoor Intrusion Detection**
   The solution's ability to normalize out false alarms will be examined. Vendor may opt out of this test if they have not developed specific tools.

These specific applications are relatively unproven. Meanwhile, facial recognition and LPR need to be evaluated on their own merits, so they will not be measured in this challenge.

System architecture — edge or server-side smart video deployment — will not be considered for this challenge. However, cost will be considered for the average business budget.

TEST CRITERIA

Systems will be rated by the following criteria.

1. *Programming UI*: Ease of programming for the smart video channel.
2. *False Read Rate*
3. *Failure to Read Rate*
4. *Output Evaluation*: Identifying what tools are provided to get information out of the system, such as input/output boards or IP HLI.
5. *Search Evaluation*: UI effectiveness in searching archived video for different event types.
6. *Deployed Cost*: How much the solution costs. It will be part of a 16-camera system with four channels of smart video, 30-day recording and live streaming.

For the Deployed Cost evaluation, the system includes 540 TVL high resolution analog cameras or 2-megapixel network cameras. As a 16-channel IP solution will cost more than a 16-channel analog one, they will be categorized separately. Channel flexibility will be noted.

Solutions will be set up by vendor specification, with a soak test period to find the optimal sensitivity level. If a smart video system takes too long to normalize its sensitivity, it will be a factor for readers to consider. One week is a commercial time frame, with equal time to program each system

VideoControlRoom will strive to be as fair as possible, like the Great Outdoor Detector Shootout earlier in the year. Readers will be told about how differences in results were caused. The results will allow readers to make up their minds, depending on their customers and application.

We invite vendors ready for the mass market to participate in the Intelligent Video Shootout. SSN