

Airports are at the forefront of using intelligent video analytics to automate their surveillance and operational needs. Recent advances in video footage search as well as better computing options at the edge promise to show an even greater future use of video analytics. However, market education is still needed to fulfill its potential.

# Time to Check-in: Video Analytics Automate Airport Security

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**V**ideo surveillance cameras have long been used in airports. The introduction of video content analytics (VCA) is a power-multiplier for cameras. "The primary goal of analytics is to transform the cameras into intelligent detectors in order to provide more reliable incidents detection and minimize human error factor," said Denis Castanet, Director of Business development for EMEA at Bosch Security Systems.

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"Video analytics is identified as a lead technology in the growing trend towards reliable, automated systems within airports," said Bill Flind, CEO of Ipsotek. Flind named some of VCA's main benefits: a wise use of VCA reduces human error, reduces man-guarding costs, provides secondary support to other systems, and greatly improves reaction time from alert to action with the use of automated triggers and alerts.

Josh Phillips, Director of Marketing of Enterprise & Critical Infrastructure at Video

Intelligence Solutions, Verint Systems, also echoed that "VCA is used in areas where alternative sensors are not practical or reliable, or where maintaining security staff for live personnel monitoring is impractical or unreliable."

### NEW DEVELOPMENTS IN VIDEO SEARCH

Apart from triggering alerts, VCA plays an important role in searching through the video feeds. The vast amounts of video footage collected daily in a busy

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environment like an airport is almost impossible to search manually. One of the key strengths of VCA is the ability to enhance the speed of searching through hours of recorded video. There are a variety of VCA manufacturers that can perform a search on the recorded video for different criteria; including color, shape, speed, and time spent in an area. In addition, some can compress hours of recorded video into a stream that shows all activity for a certain time frame, thus simplifying searches for only the things the user is looking for.

“Technology now not only locates a person, but also tracks their route and determines their last known location,” said Jamie Wilson, Security Marketing Manager for EMEA at NICE systems. It works by creating a searchable database of images in real-time, of all the people who have been ‘seen’ by surveillance cameras on the network. The investigators can search this database to identify the person they are looking for either according to a time frame or based on a description or picture of the suspect. Using this information the investigator is able to rapidly screen the results to see if the person they are looking for is displayed. Once they have located the person the system presents



the investigator with a time-stamped map highlighting where the person has been and at what time and the route taken. Crucially, it will also display the last point the person was spotted, for action to be taken.

## MULTIPURPOSE USE OF VCA IN AIRPORTS

The most common video analytics features are intrusion detection and unattended baggage. Examples are detection of people entering the baggage area through the exit, loitering in secure areas, walking in the wrong direction, detection of vehicles parked in no parking zones, detection of people near the runways or near parked aircraft, and queue management for check-in areas and security lines (measuring the amount of time a person has to wait in line).

VCA is used mainly for security purposes; however, as it becomes more common, more uses are adopted at airports. “Our experience with VCA is that it is used only to the extent that the end user understands its capabilities. This commonly results in the VCA being used for security purposes initially and as its potential is realized by the end user, migrates into lots of other uses,” said Kirk Huss, System III Engineer for G4S Technology USA. “Like any technology,


1 **Josh Phillips**, Director of Marketing of Enterprise & Critical Infrastructure, Video Intelligence Solutions, Verint Systems  
2 **Todd Brodrick**, Director of Sales, South West USA, Pelco by Schneider Electric



as users become more familiar with VCA, they realize its potential and begin using it for things other than security related issues. Once trained on the system, they get very creative and apply it to all sorts of their business operations.”

Examples of this “dual-use” are re-using existing systems for customer service (queue management for instance) or marketing (customer behavior analysis). “The more advanced VCA is going a step

## Checklist for Systems Integrators When Implementing VCA



Video analytics can be a helpful and valuable tool for airports, but before implementing such a system, systems integrators should pay close attention to the end user’s requirements.

Here, industry experts share their experience in what SIs should consider when implementing VCA.

The challenges are multiple and will inevitably vary based on the client, their requirements, and their procurement approach. However there are some common themes we have come across on a regular basis in our deployments:

- Are the client’s requirements achievable? In some projects the expected solution cannot be achieved.
- Understanding the business case: Not just the stated outcomes but also the assumed outcomes or worse omitted.
- Working on the protocols: The protocols that go hand-in-hand with the technical solution can be overlooked or undervalued, especially with tenders put through a technical project delivery procurement route.
- Clarifying the high-level purpose of the system: Is it decision making or decision supporting?
- Educating and training: We normally deliver education ahead of training for clients not familiar with what analytics can and cannot provide in particular use cases.



↑ **Neil Norman**, CEO, Human Recognition Systems



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further and actually forecasting with high confidence when a long line will develop, not after it has already happened," added Phillips. This allows retailers the ability to maximize staff members who sit idle when lines are empty.

Information can be shared also between parties in the airport. Store owners in the airport will usually have their own video surveillance systems inside the store. Even though they are not connected to the airport's system, information can still be shared through mobile applications (e.g., send a picture of a suspect from the store to the airport police), described Todd Brodrick, Director of Sales for South West USA at Pelco by Schneider Electric.

## FUTURE: VCA TO INITIATE CAMERA TRACKING

Today, a major constraint is in making analytics work in a crowded environment. As VCA algorithms improve, so will the ability to overcome the crowded environments at airports. The next challenges in line are successful tracking and hand over from camera to camera. Crowded scenes or obscured views can make reliable tracking across multiple cameras intricate to achieve. However combining other technologies and systems to assist tagging and tracking of individuals through busy scenes such as airport terminals can deliver better results.

"Beyond the analytics themselves the next step is automating the entire process — somebody leaves a bag and



Video analytics can be used for queue management at check-in areas and security lines, measuring the amount of time a person has to wait in line. Image courtesy of Bosch Security Systems.



the system will automatically jump back and look for the person who left it, recognize him from the database, follow him around as he passes through other parts of the airport, and alert the nearest police officer or guard on duty," stated Dr. Rustom Kanga, CEO of iOmniscient. "Already we have started using multi-sensor technology — sound and smell in addition to the video. Humans use all their senses and analytics should too. For example, if the camera detects someone falling down and detects the sound of a gunshot it is a different situation than a simple slip and fall. In years to come

such multi-sensor analytics will become ubiquitous."

## VCA IS NOT A CURE-ALL SOLUTION

Market knowledge levels are still a concern for vendors and systems integrators implementing VCA solutions. One of the major challenges facing vendors and systems integrators is explaining that VCA is not a panacea and explain its realistic expectations.

"The commercial challenge is for customers to understand what the technology can and cannot do," explained

- You need to have a deep understanding of the customer's business to decide in which way to use analytics.
- Pay attention to the network design when you deploy an analytics solution.
- Choose a provider with real support; each deployment is different and unique.
- When possible, use analytics running at the edge and video cameras with automatic alert generation.
- At all times, a proof of concept will be necessary to fine-tune and adjust the solution.



↑ Jorge Heller, Technology Director, Redisul

- Chose a video analytics application that fits your current and future situation.
- Carefully look at the licensing model for the vendor and see how it is priced in camera deployments.
- Analyze the ability of the application to extract the data and to create reports.
- If you have an existing camera installation, make sure that the application integrates with the technology.
- Check and see if the application is used in similar installations.



↑ Mike Davis, President, Infax

Kanga. "We focus on educating the market. Most customers use a tender process for their purchasing. If the specifications in the tender are vague the customer may get something that meets the specification but does not work in practice. For instance, if the specification asks for 'abandoned object detection' they will get a different response than if they ask for 'abandoned object detection in a very crowded place.' Those few words can make a difference between whether the customer gets something that will work or not."

"I think the challenge is always the culture. Video analytics is a real new thing in our market, so we spend a lot of time showing to our customers the power of the solution. After that, the solution's technical needs must be redesigned. Usually the customers look at video analytics as a showcase, not as a real solution. We always take potential customers to visit actual customers in order to demonstrate the incredible power of the analytics solution," explained Jorge Heller, Technology Director of Redisul, a Brazilian systems integrator that took part in securing some of Brazil's airports prior to the last FIFA World Cup.

"We continue to witness a large variation in client knowledge for analytics from those procuring solutions from a zero base through to consultant experts. Even within procuring teams knowledge can vary significantly and it is not always those with the most knowledge that are permitted the most procurement authority," added Neil Norman, CEO of Human Recognition Systems.

Norman too stressed that education is a critical element of the business development and delivery teams' role for analytics is still to avoid disappointment or underuse of the systems. **AVS**

## Where to Run the Analytics?

**V**ideo analytics are generally built on two different types of architecture: server-based and edge-based, performed on the camera.

"Camera-side offers scalability and redundancy but lacks in features, performance, and management, whereas server-side offers enhanced performance, features, and management capabilities, but lacks in scalability and has high bandwidth requirements," explained Zvika Ashani, CTO of Agent Video Intelligence (Agent Vi).



↑ **Zvika Ashani**, CTO, Agent Video Intelligence

Server-based analytics enjoy several advantages since the servers are all at one central location: easier configuration, management, and maintenance. Since power supply and cooling are less of a concern, it also allows for increased processing power and support for complex video analytics algorithms that provide high performance and easier integration with VMS and PSIM systems.

Running the analytics at the edge saves on bandwidth, as constant video transmission over network is not required. It allows for direct control of PTZ camera with minimum latency and since the uncompressed video is analyzed directly at the camera the video analytics performance improves (the video feed doesn't change due to compression). Video can be transmitted on demand or automatically when an event of interest is detected (black screen technology). The major obstacle is the camera's size, power consumption limitations, limited computing power, limited storage space, and limited temperature tolerance operating in direct sunlight or freezing conditions.

Industry professionals predict a trend towards more VCA-at-the-edge units to overcome the limitations of the camera is via two approaches: sharing the workload between edge-unit and server or adding computing power to the camera with an external device.

"A distributed processing approach which utilizes both camera and server processing provides the best of both worlds in terms of scalability, performance, feature set, manageability and bandwidth consumption," noted Ashani.

