Understanding crowds and the road to scalable intelligent security

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So What? Who Cares?

Space
Protecting crowds in publicly accessible locations from terrorist threats.

Problem
Owners and operators of all Publicly Accessible Locations (PALs) have a responsibility to ensure the public in these areas are safe and secure. In transport hubs there are already safety and security protocols to mitigate risks. However, many methods are resource intensive and rely on over-stretched staff. Security staff need to watch all the areas all the time - an impossible task.

Solution
Situate provides a way to monitor and track crowds of people, using the the crowd as a sensor to understand events in real time. When combined within the SAPIENT framework this can be used to trigger alerts and track individuals.

Results
Demonstration in reduction of cognitive burden and detection of events in crowds.

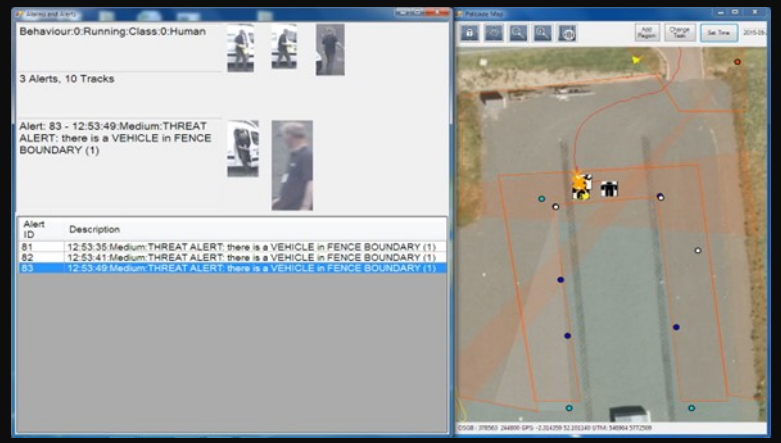
TRL
Situate: 7, SAPIENT: 8-9, Combined System: 6

What is SAPIENT?

Modular sensor network, incorporating autonomous sensing, processing and fusion

Develop capability: from this…

… to this



- Raw data is piped continuously to the analyst, data overload.
- Relies on human cognition for detection, Threat-assessment and Sensor-management
- Users experience “vigilance decrement” over time
- Problem compounded by low operator to screen ratio

- Multiple sensor modalities
- Acting autonomously with overall coordination
- Analyst is detached from individual sensing modalities
- Sensor suite provides persistent coverage, robust to individual failures
- **Supplying information rather than raw data to the user / analyst**

Part of the Contested Urban Environment trials 2019 in NYC
Released as a British Flex Standard

Thomas, P. A et al (2016). SPIE, 9831. https://doi.org/10.1117/12.2229720

About Situate

Live Crowd Tracking
System sees in real-time where crowds are and where they are going, providing live headcount and movement data for people within any space.

Privacy Protected
Our technology is pseudonymised, protecting the privacy of your space users.

Long Range
A single unit can cover and area of up to 50m and can be installed and operated quickly by building operators.

Intelligent Predictions
Long term data trends can be used to provide predictions of future space usage and highlight potential issues.

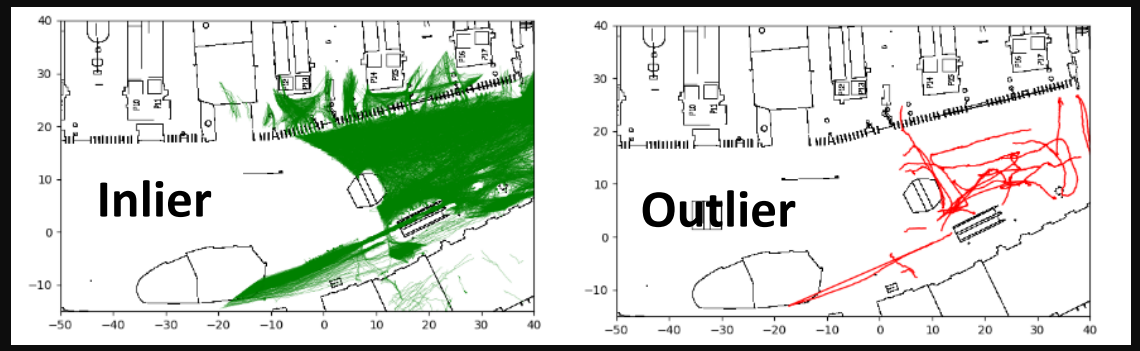
Open Communications
Built upon the SAPIENT standard. Transmits information not data to reduce bandwidth allowing interoperation between sensor modalities.

Scalable Intelligent Security

Anonymous Tracking
Extract individual tracks classified for speed and direction
Data Analysis Engine providing flow, density, Anomalous behaviour

Fusing of Additional Data
Combine data from other sources (e.g. alerts from radiation detectors or metal detector portals) with tracking data to build probability of alert while reducing false alarms

Cross cue sensors using SAPIENT
Task cameras or robots to investigate issues, including bringing in facial recognition to break anonymity when there is justification



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