Multitiered Video Analytics for Abnormality Detection and Alerting to Improve Response Time for First Responder Communications and Operations

Shishir K. Shah*, Julie Stroup**, Hinrich Schmidt** and Pranav Mantini*

*Department of Computer Science - University of Houston, **City of Houston Public Safety Video Initiative

Project Objective

- Develop a framework and video analytic algorithms for online learning of video characteristics and use them for abnormality alerting.
- Evaluate the impact of developed video analytics and alerting for public safety, specifically in reducing response time related to video surveillance.

Use case: Dispatchers continuously review thousands of cameras for abnormalities such as non-functional cameras, unusual events, and suspicious behavior to communicate relevant information to first responders.

Need

- Ability to perform proactive surveillance to quickly respond to incidents.
- Tools for automatic camera operational management and alerting.

Proposed Work

Analyze video and generate automatic real time alerts.

- Maintenance alerts
- Abnormal events
- Abnormal behavior

Enable quick relay of information to first responders through dispatchers.

Partnership with City of Houston

- City of Houston began developing a Public Safety Video System (PSVS) to improve situational awareness of public venues, critical assets, and public safety areas of interest.
- To date, the City has implemented 850+ cameras in the region as well as gaining access to over 400 more through partnerships with other stakeholders.
- It is used by qualified Public Safety personnel for forensic purposes and live viewing on a routine basis.

COH Public Safety Video Initiative

Project KPIs and Goals

Algorithm Development and Evaluation

- Simulated and real-world data to train, test, and evaluate algorithms for different levels of alerting.
- Understanding the accuracy of developed algorithms and computational performance of the overall system.

Deployment and System Evaluation

- Deploy the analytics for continuous monitoring of cameras within the City of Houston PSVS.
- Benchmarking and performance characterization.
- Usability analysis.

Impact on Public Safety

- Enhanced analytics development.
- Understanding of novel use cases for analytics.
- Best practices for applying analytics to video surveillance systems.
- PSIM integration requirements understanding.

http://www.qil.uh.edu/ (shah@cs.uh.edu)