

# Smart Video Systems in Police Cars

**Amirali Jazayeri**  
**Hongyuan Cai**  
**Mihran Tuceryan**  
**Jiang Yu Zheng**

**School of Science**

**Indiana University – Purdue University Indianapolis**

## Abstract

The use of video cameras in police cars has been found to have significant value and the number of such installed systems has been increasing. In addition to recording the events in routine traffic stops for later use in legal settings, in-car video cameras can be used to analyze in real-time or near real-time to detect critical events and notify police headquarters for help. This poster presents methods for detecting critical events in such police car videos. The specific critical events are person running out of a stopped car and officer falling down while approaching a stopped car. In the above situations, the aim is to alert the control center immediately for backup forces, especially in the last example when the officer is incapacitated. In order to implement real-time video processing so that a quick response can be generated without employing complex, slow, and brittle video processing algorithms, we use the reduced spatiotemporal representation (1D projection profile) and Hidden Markov Model to detect these events. The methods are tested on many video shots under various environmental and illumination conditions.