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Video Analytics for Public Safety

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The world is experiencing a surge of video aiming to address public safety needs and concerns. Automated video understanding can enhance surveillance/monitoring systems beyond what is possible for human operators alone. Camera networks are being developed to maintain long-term surveillance on large numbers of video streams for various applications with minimal or no manual intervention. Automated systems can coordinate multiple cameras and provide "synopsis" views of activities that can be used to predict potential events in advance or analyze them after. Wearable body cams and vehicle cams are coming into the mainstream and are presenting new challenges to automated analysis due to their dynamic nature. Robust real-time behavior and action recognition methods will enhance the timely responsiveness of first responders and security personnel. This increased surveillance capability must be seen in the light of the Freedom of Information Act (FOIA) and tempered by the public's concern for privacy.

This special section represents a sampling of approaches being taken to address a wide range of public safety needs. In many applications, tracking of people is a core technology, and one of the papers addresses one of the more challenging problems of tracking in the presence of occlusions. In real-

time and forensic applications, there is often a need to understand crowds. Papers are included here that present methods to estimate crowd density and crowd behavior. The ability to recognize or, conversely, not recognize people is a perennial concern in surveillance systems. In this regard, the special section includes a paper on semantic description of a person's appearance and two papers on obscuring identifying information to maintain privacy. One of the privacy-preserving papers is a survey of redaction techniques, and the other paper describes a thermal imaging modality. Roadway cameras are becoming an integral component of our transportation network. One of the contributed papers describes methods of determining and understanding various paths and conflicts, vehicle-to-vehicle and vehicle-to-person. Gang-related crime is a significant public safety concern. Graffiti can indicate the presence, identity, and activity of gang and gang members. This special section contains a paper aimed at this challenging and important problem.

While computer vision and video analysis is a well-researched area, video analytics specifically aimed at public safety applications is becoming a new and important direction. We hope the present special section brings focus to this application space.