Detection of Unusual Objects, Actions and Events in Streaming Video Surveillance Data

Presentation at Smart Cities Research Cluster, FedEx Institute of Technology on March 27, 2018.

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Goals

- Develop efficient and effective algorithms for quickly

1. detecting unusual (or salient) objects, actions and events in streaming video surveillance data, and

2. reporting it to the concerned authorities for proactive action.

- Success in this endeavor will significantly benefit the society at large and, in particular, the City of Memphis by
  - reducing its expenditure on surveillance
  - improving quality of surveillance by allowing proactive action from officials to stop crime.

Data

- We are working with data from at least three sources:

1. Benchmark datasets: UCSD, Avenue, U-turn, Subway, UMN and Web.

2. Data from City of Memphis Police: 24 hours of video data from 25 surveillance cameras at different locations in Memphis.

3. Data from Univ. of Memphis Police: 14 days of video data from 50 surveillance cameras at different locations in/around the UofM main campus where interesting events occur more frequently.

Detecting Unusual Objects, Actions and Events
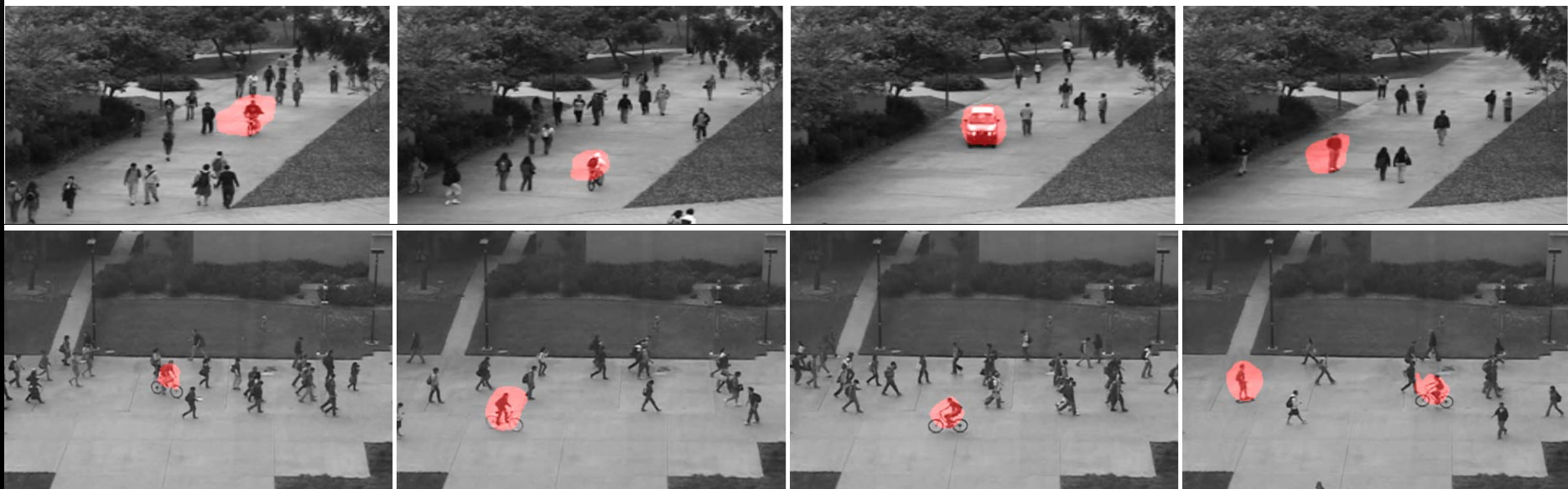
Abnormal frames and their detection result from UCSD Ped1 (top row) and UCSD Ped2 (bottom row) using our model. The bikers, skaters and cars were detected as anomalous patterns (highlighted in red). The proposed method can detect multiple anomalous patterns within a single frame.

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Abnormal frames from UMN dataset. Anomalous regions, as detected by our model, are highlighted in red.

Detecting Unusual Objects, Actions and Events

Anomaly detection in Subway dataset. Top row represents entrance gate and bottom row represents exit gate. Anomaly detection includes detection of wrong direction events and no payment events. Anomalies detected by our model are highlighted in red.

Acknowledgements

- **Doctoral students:**

  Jayanta Dutta (now at Bosch Research)

  Shamima Najnin (now at Intel)

  Masoumeh Heidari Kapourchali

  Murchana Baruah

- **Funded by:**

THE UNIVERSITY OF MEMPHIS.