CPS: TTP Option: Medium: Discovering and Resolving Anomalies in Smart Cities

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Challenge:

- Activities due to humans and vehicles are heterogeneous, distributed, vary over time, and mutually interact, making them hard to capture, understand, and mitigate issues in a timely manner
- Anomalies are complex and rare, depend on context, and depend on the spatial and temporal extent over which they are observed

Solution:

- From Visual Data, automatically *discover* and *resolve* complex activity by humans and vehicles in large environments
- Extract anomalies in the presence of noise patterns in processing algorithms
- Discover spatial and temporal extents for anomalous patterns
- Detect anomalies based on context
- Resolve anomalies through automatic and human-in-the-loop methods.
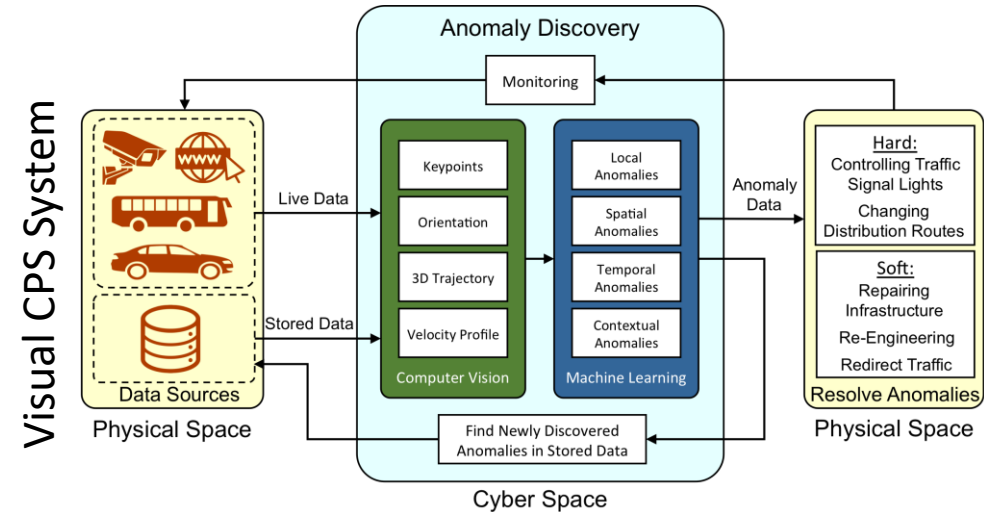
Scientific Impact:

- CPS Framework for visual data analysis
- Machine learning and computer vision methods to detect anomalies from *stationary* or *moving* cameras
- Methods for sharing data between distributed systems

Broader Impact:

- Safer, more efficient roads
- Monitoring of roadways and roadsides
- Maximizing distribution services
- Deployment in Pittsburgh areas
- Courses, internships, undergrad/grad projects
- Demos/tours to K-12 & diverse student groups