



# CPS: Small: Intelligent Prediction of Traffic Conditions via Integrated Data-Driven Crowdsourcing and Learning (Award ID: 1932482)

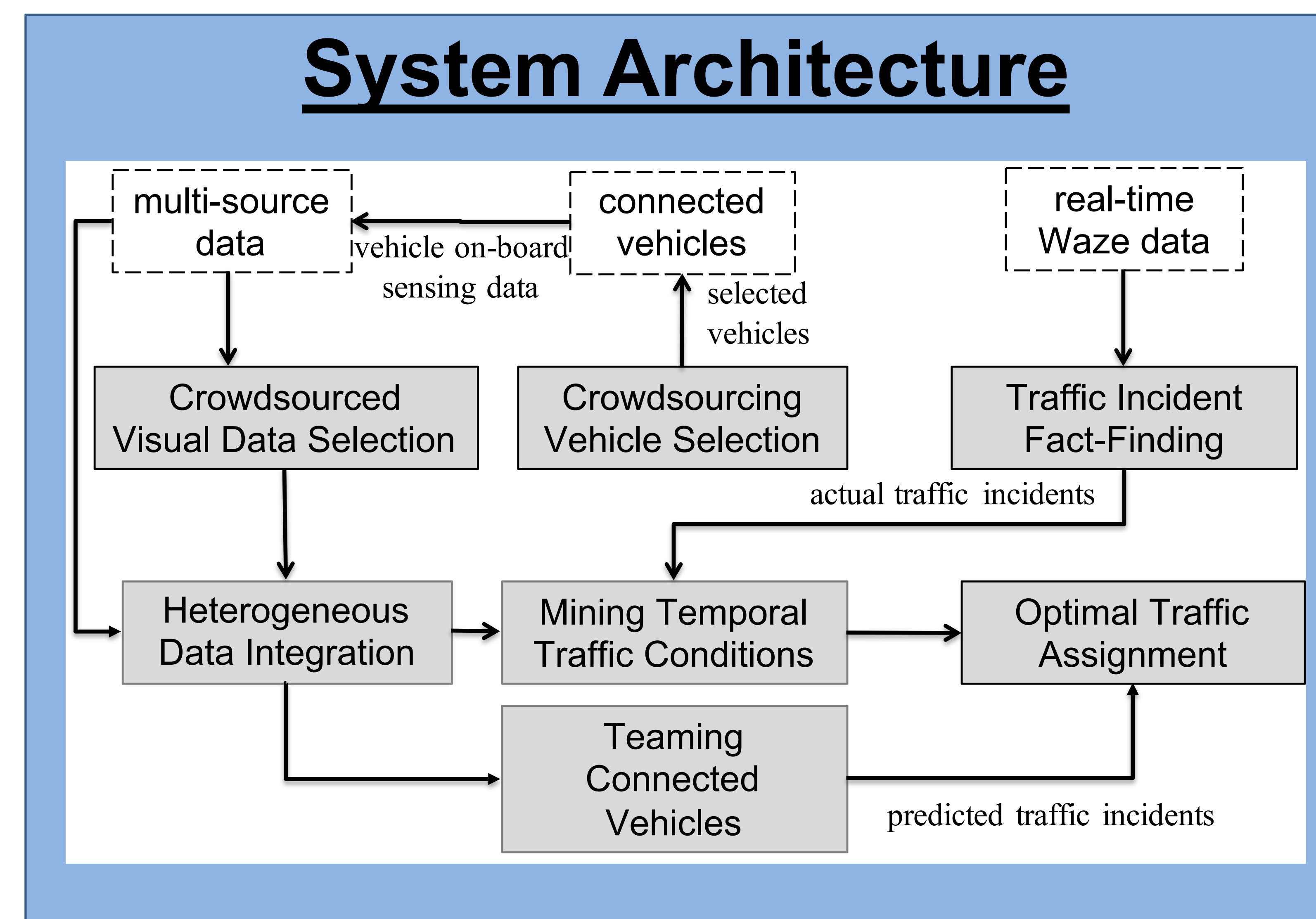
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## Challenges:

- Road safety and congestion
- Current practices: **reactive**

## Solution:

- Transform traffic management via predictive analytics on rich data streams
- Enable proactive management of traffic incidents
- Couple machine learning techniques with crowdsourcing



## Scientific Impact:

- Integration of crowdsourcing and intelligent learning can be extended to enable other smart and connected communities

## Broader Impact:

- Cities could **proactively** deploy assets and manage traffic
- Reduce emergency response time,
- Inspire, train, and prepare next-generation scientists to tackle challenges in smart and connected communities

## Recent Progress Highlights

- A multi-instance support vector machine has been developed to predict traffic conditions to integrate the information collected from multiple types of sensors, such as dashboard camera, satellite images, vehicle speed. This model scales very well to the number of features (the number of sensors) of input data because of its linear computational complexity, which is particularly suitable to deal with large-scale traffic data. Experimental results support the effectiveness of this new model and its computational efficiency.
- An attention-based deep neural network is being designed to simultaneously predict traffic conditions on roads and traffic flow delays. Because of the mathematical nature for training neural networks, this model will be able to use both the data collected at places of interest and historic data for enhanced prediction performance.
- Developed a framework for processing crowdsourced data and then building effective traffic prediction models