Prototype Systems Architecture
For Coalition Situational Understanding

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Introduction

The implementation presented in this work forms a prototype of a conceptual architecture[1] that looks to address the key concerns within Coalition Situational Understanding (CSU)[2].

Here specifically, **we summaries a suitable scenario that requires a CSU approach and we showcase the architectural principles and techniques used to bring together an array of services from the various research**.

Scenario

In order to develop novel techniques towards CSU we have been investigating the scenario of **identifying traffic congestion on the roads within a city (London,UK)**

It is worth noting that although the problem of identifying congestion could be considered to be solved, it is approached using purpose built and purposely placed sensors and systems at significant expense, time and effort. **Our approach looks to bring together multi-purpose services and data sources to gain an understanding of the relevant parts of the situation in a highly agile and cost-effective manner.**

Key Outcomes

We have established a method for chaining together independently written coalition services and created a paradigm for adding semantics to information generated by those services.

We have tested a coalition system architecture that facilitates low-to-high level reasoning to determine whether a route through the city will be subject to delays.
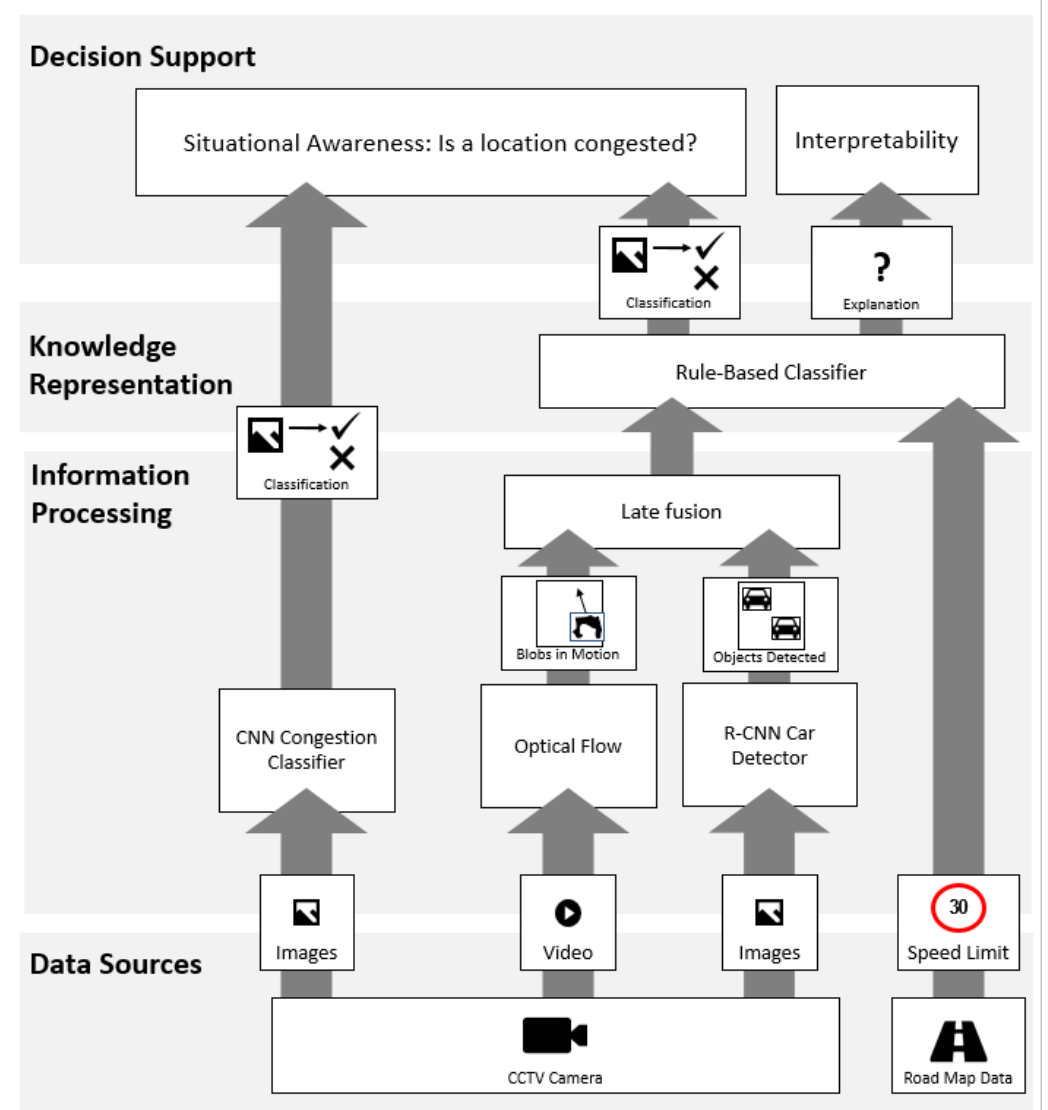
Prototype Architecture

Figure 2: Implemented prototype architecture used to test and progress CSU techniques.

References

[1] A. Nottle, S. Quintana-Amate, D. Harborne, M. Alzantot, D. Braines, R. Tomsett, L. Kaplan, M. Srivastava, S. Chakraborty, and A. Preece, "Distributed opportunistic sensing and fusion for traffic congestion de- tection," in First International Workshop on Distributed Analytics InfraS- tructure and Algorithms for Multi-Organization Federations, 2017.

[2] S. Chakraborty, A. D. Preece, M. Alzantot, T. Xing, D. Braines, and M. Srivastava, "Deep learning for situational understanding," in IEEE International Conference on Information Fusion, 2017.