

Folks

Here is the list of projects we talked about and also the set of topics we will read papers on as well as their correlations.

Multimedia Sensor Stream Processing Middleware for Pervasive Applications

Project 1: Configuration Manager

This is the repository of all the components that for the multimedia stream system. It will enable us to (1) define all the stream types supported in the system, (2) create node types – e.g., specify and register a analysis code (say that takes an jpg image and outputs a count of number of people in the image), (3) instantiate stream processing topologies, (4) map stream processing topologies to an underlying computational nodes, ...

Complexities involved will include how to deal with mobile sensors, how to provide hooks that in the future load balancing etc can be achieved in the system.

Project 2: Sensor Acquisition and Transformation Language (SATL)

This project will identify, develop, and implement a higher level language using which sensor data acquisition and processing plans (as needed by the higher level queries can be specified). The implementation will include working with the configuration manager interface to validate that it is indeed a legal specification, and then convert the high level query into an instantiated stream processing topology. Issues of multi topology optimizations could be also explored though the implementation will probably not advance to that level during the course.

Project 3: Creating the abstraction of Virtual Sensor

One of the primitives that the multimedia sensor middleware we are designing will need to support is the concept of virtual sensors. A virtual sensor is a special type of a processing node that takes in a bunch of multimedia streams and provides the abstraction of complete sensing filling in sensing values in spaces and for time periods for which the actual sensor values might not be available. The concept is quite abstract and what will be expected will be to explore it in perhaps a one or a few specific contexts.

Project 4:

This project will explore issues of privacy as related to pervasive spaces. The multimedia streaming middleware enables capture/acquisition of sensor data some of which might be personalizing. Such data is collected for the purpose of building the applications – either surveillance type observation system or for the purpose of providing some utility/functionalities to individuals immersed in the pervasive space. The goal of this project would be to identify what are the privacy issues in pervasive spaces of interest

and approaches to enable “privacy knobs” with the middleware to control information disclosure.