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OpenSense RTD 2010

FNSNF

Utility-Driven Data Acquisition in Participatory Sensing

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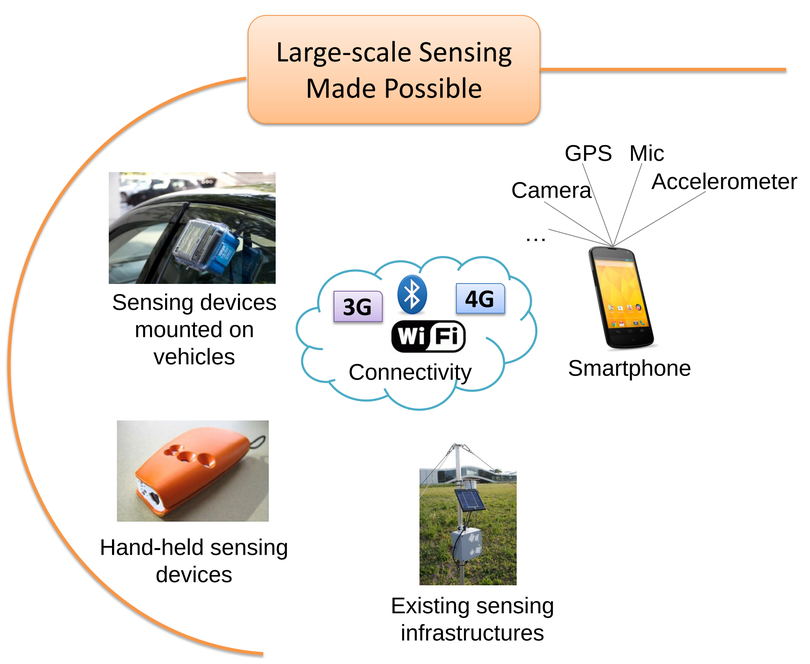
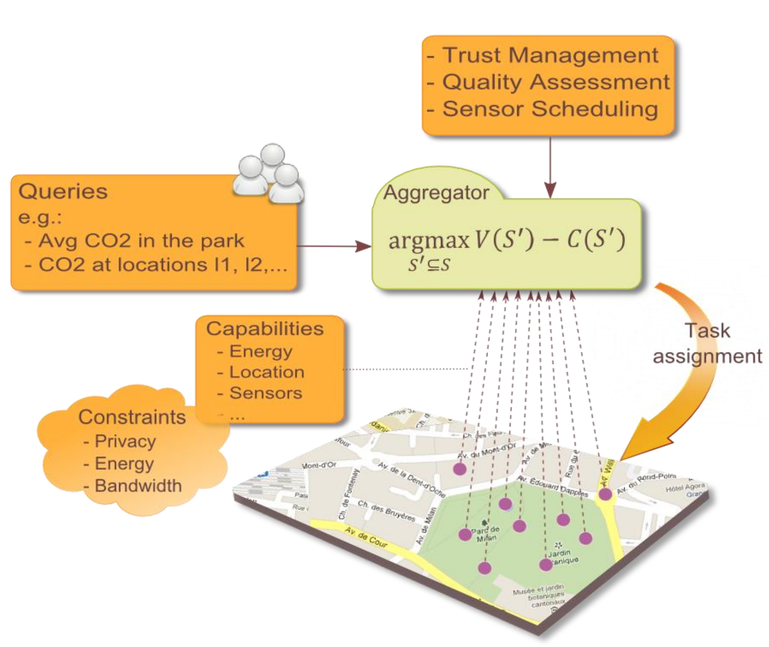
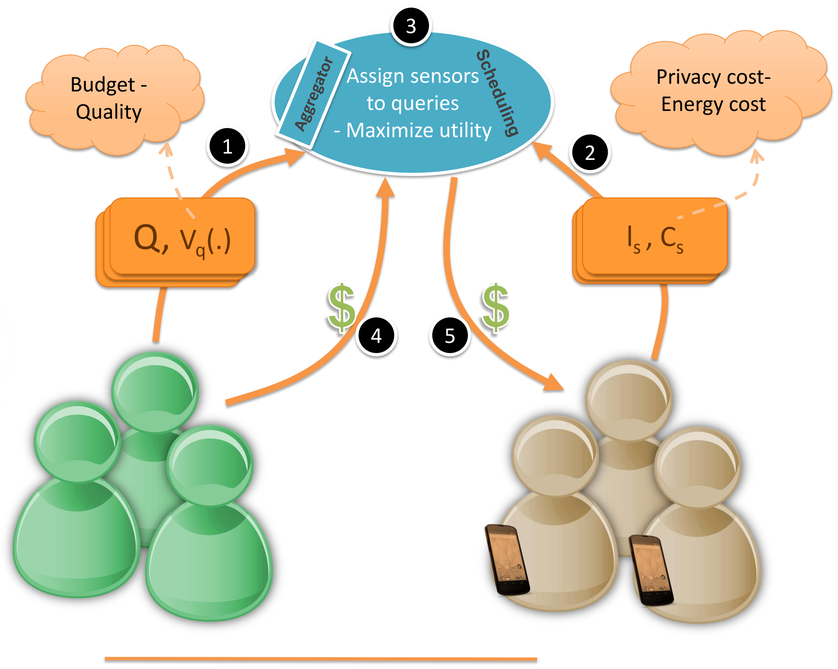
Large-scale Participatory Sensing



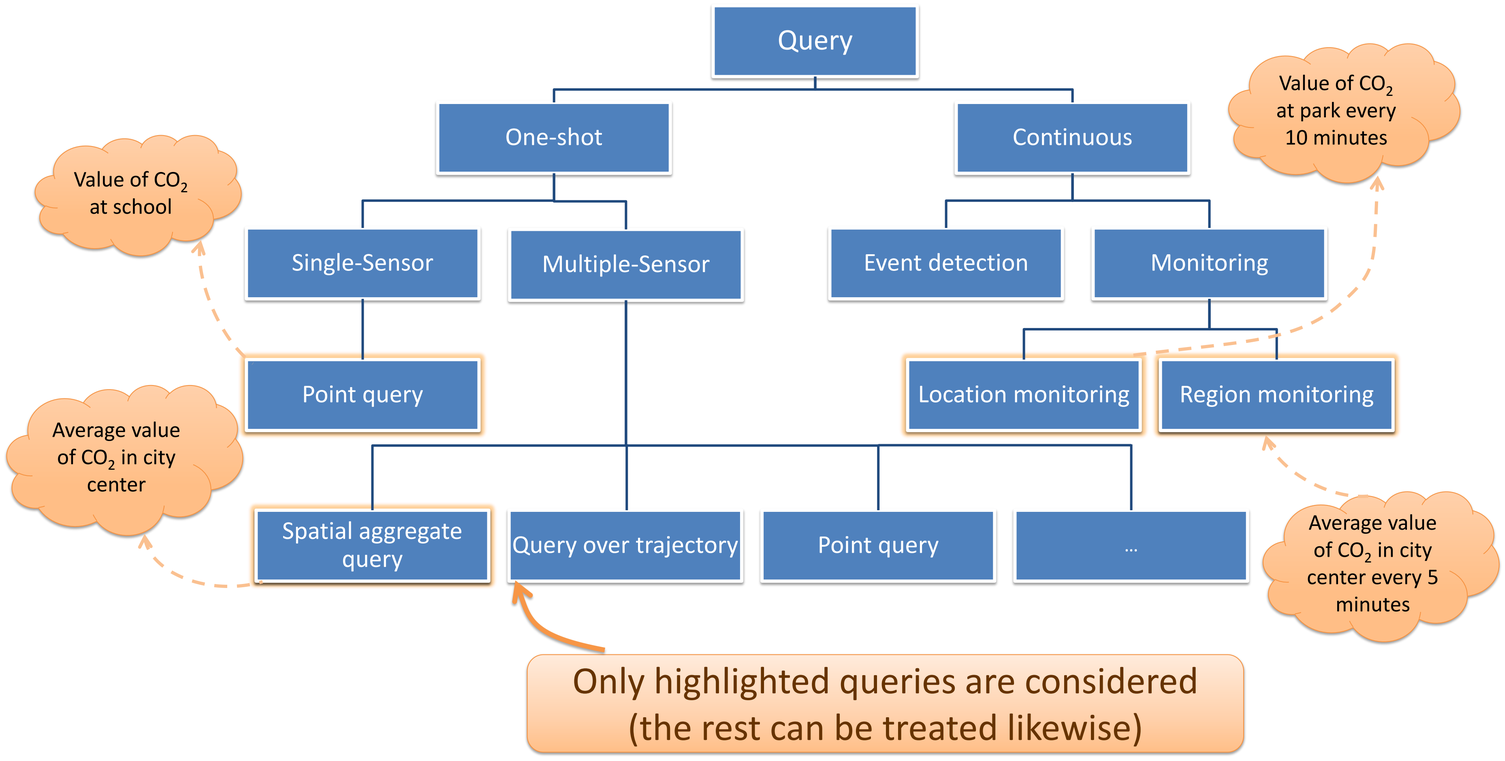
Participatory Sensing Components Overview



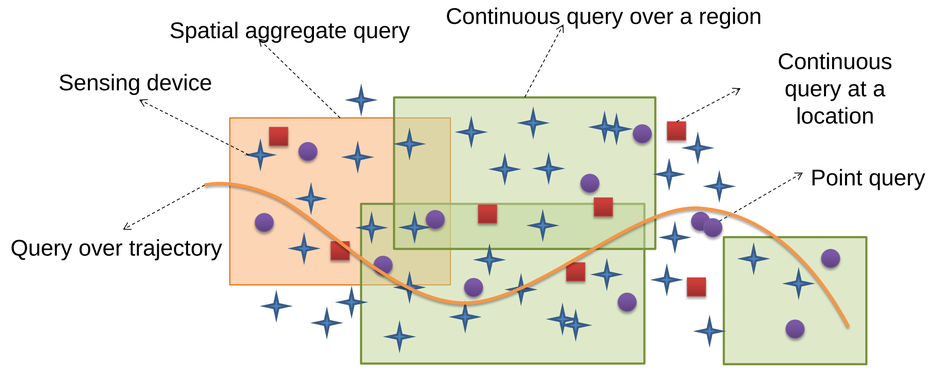
Sustainable Participatory Sensing



Major Query Categories in Participatory Sensing Context



Multi-query Processing: Making Use of Commonalities among Queries in order to Share the Costs

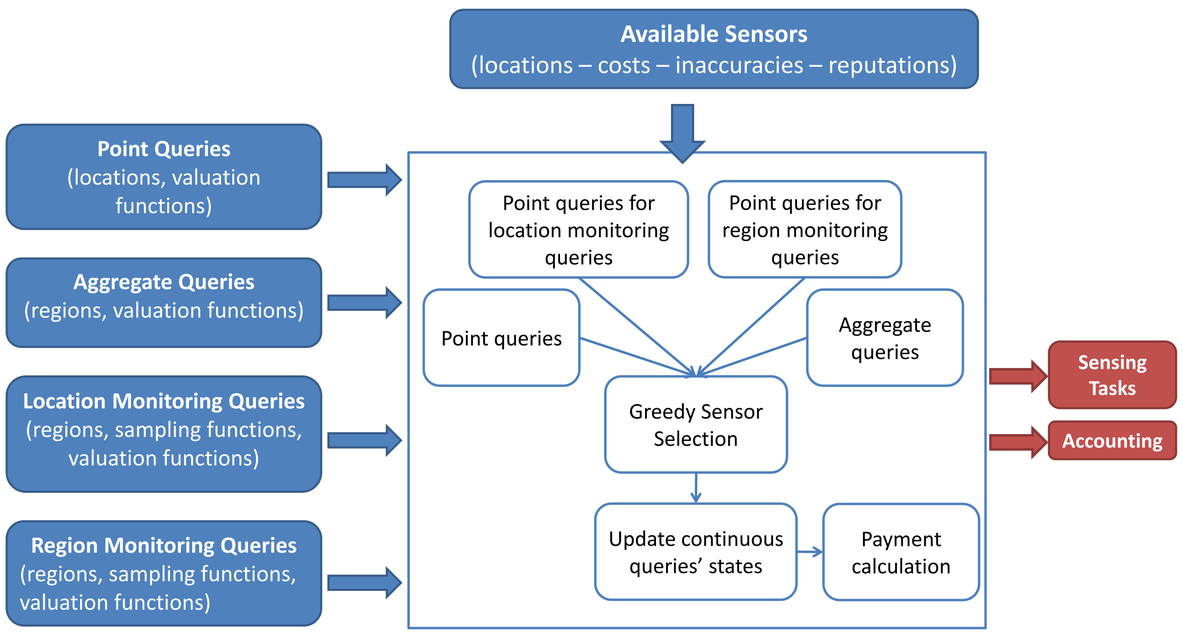


Myopic Scheduling

- **Long-term scheduling** for optimizing utility over a long period is not possible due to lack of information (i.e. sensor locations, sensor costs, future queries are not known in advance)
- **Workaround:** scheduling is performed in every time slot, where all information is available

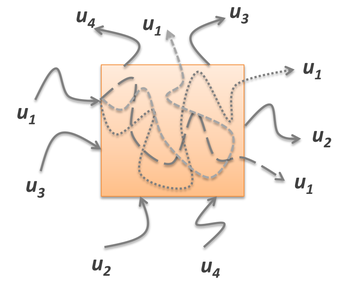
Sensor Selection for a Combination of Queries of Different Types

- Finding ***optimal*** set of sensors is **NP-Complete**, therefore we propose ***heuristic*** algorithms for answering *multiple queries of the same type*.
- Using these algorithms, we select sensors for providing data for the combination of *multiple queries of different types*.

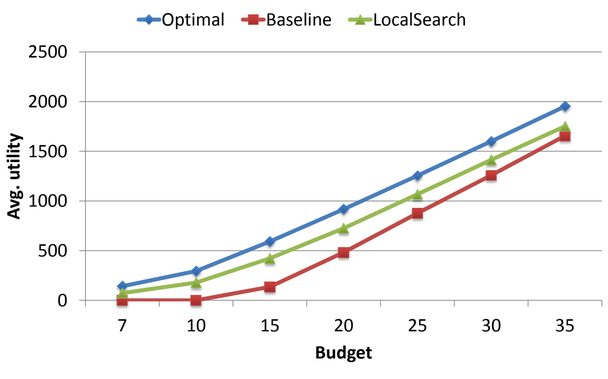


Simulation Study

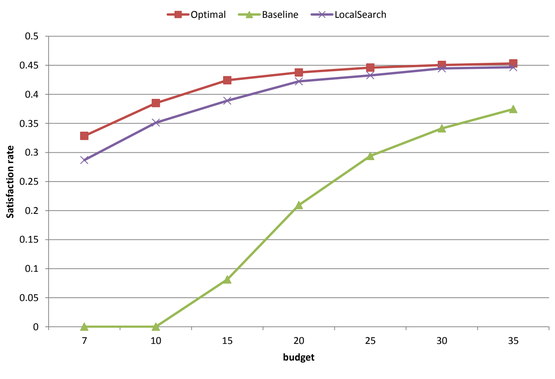
- The impact of ***privacy sensitivity*** and ***energy cost*** preferences of participant and their ***trustworthiness*** on the total utility and on the number of satisfied queries
- Randomly moving sensors in a 2D region
- Sensor measurement limit of at most 10
- *Only point queries*



Average utility per time slot



Query satisfaction ratio



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