

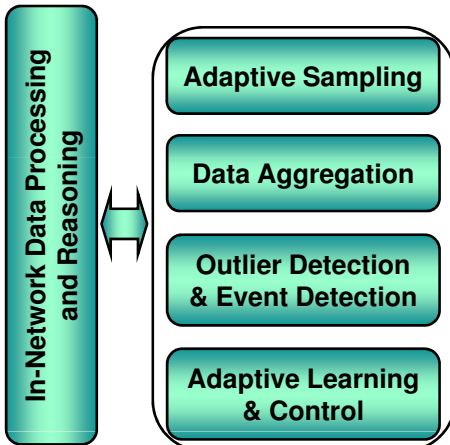
# Collaborative in-network data processing and reasoning



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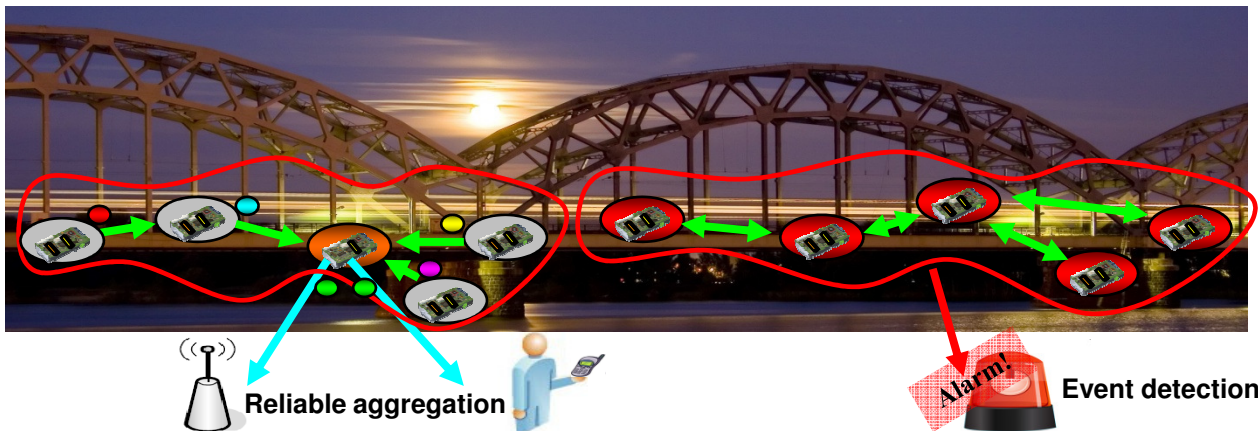


## Quality aware distributed data processing and reasoning



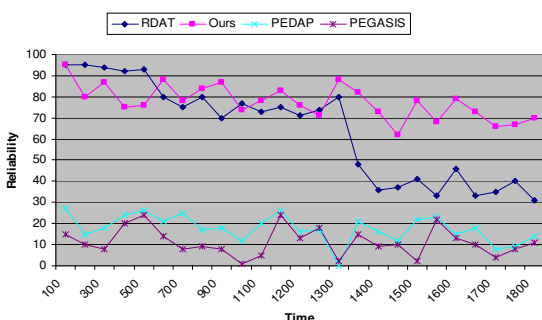
- Developing innovative distributed adaptive sampling and data aggregation mechanisms for handling the tradeoffs between the data granularity, energy efficiency, and application's required quality of services
- Developing collaborative hierarchical in-network data processing to process data and events in a distributed manner at different spatial and temporal resolutions and collaboratively and collectively perform a task by having an eye on quality of service requested by application
- Developing alarms generation techniques, which are able to correctly and efficiently monitor structures and detect events and accidents as well as abnormal occurrences not complying with safety regulations in an online and distributed manner at the right time and at point of action.

## Quality aware distributed data aggregation and event detection



We aim to achieve reliable and energy-efficient data transmission and aggregation. We use the concept of functional reputation and trust as a means to reach reliability. Functional reputation is used to select nodes that best satisfy the criteria to be an aggregator on the basis of the quality of the node. To find out the best path from every sensor node to the aggregator we take into account the link availability and residual energy of the nodes over the path. Simulation results show that even though our approach introduces some delays, overall it outperforms the other approaches in terms of reliability and lifetime.

Path Reliability between Aggregator and BS



Path Reliability between SNs and Aggregator

