

Network-Aware Wireless Sensor Data Management

Panel Organizers:

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Abstract

Sensor Networks have brought closer than ever before the network and database research communities. A novel sensor data management paradigm appeared with the development of data centric routing protocols viewing the network as a huge distributed database. However, this paradigm is typically supported through a query processing layer that treats the wireless network as a black box and underestimates its fundamental limitations. In this seminar we elaborate on these limitations and utilize them in favor of efficient data management in wireless sensor environments.

In the first part of the seminar, we will cover relevant background in wireless networks and review specific requirements for data-intensive sensor applications. We will introduce data management strategies that properly fuse network and database techniques for efficient query processing in wireless sensor networks. We will consider cross-layer query optimization that utilizes the information about how the lower networks layers operate while processing sensor queries. An example of such an optimization is collision-aware query scheduling that avoids wherever possible simultaneous transmissions in the same collision domain.

In the second part, we consider how proposed network-aware techniques can facilitate data delivery in mobile sensor networks. In particular, we will introduce multicriteria optimization strategies to capture various mobility trade-offs in sensornets. We will compare these techniques with existing wireless network standards and explore to which extent they help sensor networks to meet QoS and QoD requirements at higher data rates and heavy network loads.