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CS 259 Project Questions

Pollution Monitoring in Wireless Sensor Networks

**What is the problem?**

Air pollution is a major hazard for human health and well-being, especially gases such as carbon monoxide, ground-level ozone, and nitrogen dioxide. Despite its significance and the dangers it poses, there is no real-time or widespread solution to monitor air pollution, preventing an accurate survey of the degree and proliferation of harmful pollutants. This lack of information prevents creating measures to improve air quality and improve an individual’s ability to know where and what to avoid, especially if they suffer from a respiratory illness.

**What is the global picture (in science / engineering)?**

The potency and usefulness of wireless sensor networks can be demonstrated and expanded through the use of WSNs for pollution monitoring. It shows that this specific technology can be used to save lives and promote better air quality.

**What is the state-of-the-art?**

The technology in this area includes on widescale, cost- and energy-efficient novel wireless sensor networks that can gather data on air pollutants across a large area and dense concentration. One solution is to set up static sensor nodes over a region that can acquire data in different places and send them to a backend infrastructure for further processing. Another solution are small, mobile personal devices that a user can easily tote around, and which are wirelessly connected to each other and can transmit the data that each device collects to all other users.

**What is the most important and promising direction?**

Pollution monitoring wireless sensor networks could provide very detailed data and knowledge. As respiratory diseases are among the largest killers in the United States and other nations, this knowledge could help push policymakers to endorse strategies to combat the severity of air pollution and promote advances in healthcare for diseases and symptoms resulting from poor air quality. At the individual level, a person armed with thorough, real-time data can avoid pollution hotspots and other problematic areas. Overall, this could provide the basis for a breakthrough in improving air quality and the quality of life for all people, especially those suffering from respiratory illness.