Wireless Sensor Networks: New Capabilities and Potentials

ABSTRACT

Successful realization of sensor networks poses several challenges in energy, coverage, fidelity, and deployment. This talk discusses how the introduction of certain new capabilities in a sensor network can help overcome these problems and yield orders of magnitude performance gains. The problem of energy scarcity has been previously addressed through energy aware algorithms that aim to extend battery life. The capability of energy harvesting can make the battery life practically infinite. The talk describes the theory of adaptive algorithms that help realize these gains in viable scenarios. Coverage and sensing fidelity problems have been attacked using high density deployments and adaptive sampling. The talk shows how the introduction of limited mobility can enhance adaptive sampling to achieve seemingly unachievable coverage resolutions. A third issue in practical application development is that of deployment and resource costs. The talk discusses how the emerging peer production paradigm may be applied to sensor networks in order to develop a shared internetwork of sensors that enables inexpensive large scale deployments through efficient amortization of resource costs.