

Wireless Smart Sensor Network

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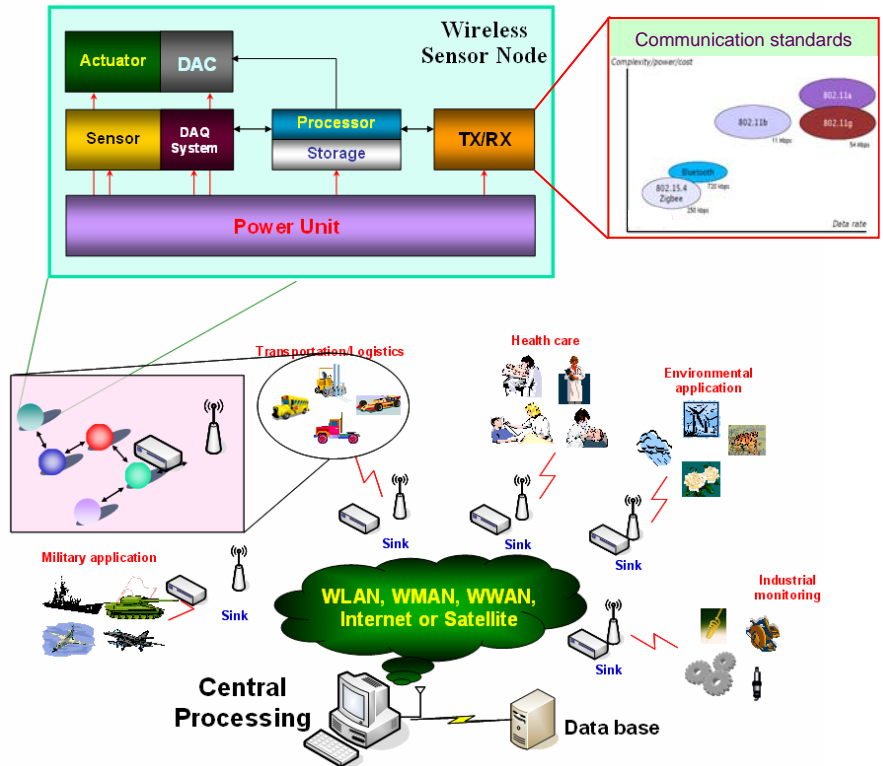
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OVERVIEW

Advances in low-cost and low-power wireless communication and micro/nano sensors as well as progress in ad-hoc networking routing, protocols and embedded systems have all made sensor networking a topic of active interest. Sensor networking will become extremely significant by providing measurement of the physical phenomena

PROJECT DESCRIPTION

The aim of this research project is to develop a wireless smart sensor node for ultra low-power applications. A wireless sensor node typically consists of a front-end sensor, data acquisition (DAQ) system, possibly an actuator and a Digital-to-Analog Converter (DAC) for control process, a data processor with some memory & transceiver architecture.



around us, leading to their understanding and ultimately the utilisation of this information for a wide range of applications.

Potential applications of wireless sensor network include environmental monitoring, health care monitoring, battlefield surveillance and reconnaissance, modern manufacturing, transportation/logistics applications, industrial monitoring, smart home applications, etc.

A wireless sensor network is composed of a large number of wireless sensor nodes, which are densely deployed either inside the phenomenon or very close to it. Sensor data is shared between the sensors and used as input to a distributed estimation system which aims to extract as much relevant information as possible from the available sensor data. The fundamental objectives for sensor networks are reliability, accuracy, flexibility, cost effectiveness and ease of deployment.

Sensor nodes are power constrained as each node operates with a limited energy budget. Moreover, since battery recharge is not always an available option, the lifetime of the entire network is a critical issue. Classical approaches such as low power hardware design provide individual solutions but remain insufficient for the energy constrained sensor systems. The energy consumption optimisation of a sensor network is a really complex challenge. It not only involves a cut in the energy consumption of single sensor nodes but also requires global solutions in order to maximise the lifetime of the entire sensor network. The network lifetime can be increased through the introduction of energy aware mechanisms and/or a smart/reconfigurable property into each stage of a wireless sensor design, dissemination and operation.

FURTHER INFORMATION

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