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Commentary

Wireless Sensor Networks and its Techniques

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DESCRIPTION

Wireless sensor networks has become the most commonly used technology of the twenty first century. WSN's (Wireless Sensor Networks) are self-configured wireless networks with no infrastructure that monitor environmental and physical conditions such as pressure, sound, temperature, motion, and vibration in the area of interest. It has a large number of low-cost, battery operated sensors, which sense certain phenomena at regular intervals for a long period and periodically send the data observed by it to a centralized point known as a sink or base station for additional observation and analysis. Between the sensor network and the user, the base station serves as an interface. Despite their small size, four basic components make up sensor nodes: sensors, embedded processors, communication units (including radio transceivers), and a power unit. In addition to sensing, the sensor nodes feature communication and processing capabilities.

Sensor nodes are comprised of Analog to Digital Converters (ADC) along with multi-functional sensors. The ADC is assigned the task of converting the analog or continuous data and signals into digital signals before passing them on to the processing unit. A microprocessor is used in the processing unit to execute operations on digital data such as aggregation and encryption. Radio transceivers are used in the communication module to send and receive data *via* a short-range radio channel. A sensor node's power module provides electricity to all of the components. Electricity is often supplied by a battery that has a limited power budget. Radio frequency, optical (laser) or infrared transmission media are all possibilities for wireless transmission. Batteries, either rechargeable or non-rechargeable, are now the most common type of power supply for wireless sensor nodes. Furthermore, because nodes can be installed in hostile or uncomfortable environments, charging the battery may be impossible or inconvenient. However, the sensor network that meets utility requirements must have a long life span. A full life span of several months, if not years, may be necessary for many circumstances. In some circumstances, such as using solar cells, it is feasible to capture energy from the outside world. However, external power supplies often exhibit discontinuous behavior, so a power buffer is also required. In any event, energy is a limited resource that should be conserved.

In wireless sensor network development, energy conservation is of prime importance and should be handled carefully. Additional equipment, like Global Positioning System (GPS) and motors, may be required in some applications to allow sensor node movement and placement. A WSN usually includes many sensor nodes established within the utility location and a base station positioned near the sensing location. The base station act because the gateway to the different networks, it sends instructions to the sensor nodes and periodically collects the sensed values of the phenomenon from them.

CONCLUSION

The sensor node locations do not need to be planned or predetermined. In the case of a disaster, this enables ad hoc deployment to inaccessible terrain or calamity relief activities. The algorithms and conventions used in sensor networks must have the capability to manage alone without any help from external resources. Another distinguishing element of the wireless sensor network is the collaboration and teamwork of sensors. Each sensor node has an inbuilt processor, which has the capability to perform simple computations on the data such as aggregation and security of data locally and transmit the processed data to the base station for further computation.

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