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An Energy-Saving Data Aggregation Method for Wireless Sensor Networks

A Project

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Abstract

Wireless Sensor Network (WSN) is one of the most important contributors to the Internet of Things and plays an important role in people's lives due to its great use in many applications. The energy provided by the battery is the most important resource in the sensor node that affects the lifespan of the WSN. Energy saving is essential as Sensor nodes are powered by their restricted battery. In wireless sensor network nodes, energy is consumed in very many ways like data reception, transmission, data processing, sensing, etc. Among all these, data transmission is very expensive in terms of energy consumption, while consumption is in data processing. Considered much lower. There are many technologies and concepts that focus on saving energy, and particularly focus on reducing data transmission, such as data aggregation. Therefore, significant energy can be saved by reducing the amount of transmitted data (i.e., data aggregation) in sensor networks. In this project, a segmentation-based data collection technique that operates at the level of sensor nodes is proposed. The segmentation method used is Extrema Points (EP). The proposed technique works periodically in three stages in each cycle: data collection, data aggregation, and data transfer. The goal of this technology is to reduce the volume of transmitted measurements by collecting the redundant sensed data before sending it to the base station, reducing the energy consumed, and thus prolonging the life of the network while maintaining an acceptable level of accuracy of the measurements received at the base station (BS) or (CH).

Evaluation of the proposed methods is performed using extensive simulation experiments. Simulation results show the efficiency of the proposed technique.