

Self-Decision Route Selection for Energy Balancing in wireless sensor networks.

ABSTRACT

In many wireless sensor network (WSN) applications, data from the monitored environmental phenomenon only need to be sampled intermittently and transmitted to the base station. Hence, an intelligent protocol that balances the traffic load among the nodes and minimizes their energy usage, especially during routing and idle listening, which is necessary to extend the network lifetime. In this paper, a load balancing model that balances the rate of energy dissipation of the sensor nodes across the network is proposed. The proposed energy balancing scheme distributes the traffic load regularly and slowly over the sensor nodes during routing, such that the overall network life time is optimized, and the sensors die almost all at the same time. The proposed energy balancing protocol reduces the high energy consumption during the transmission and reception states, this is done by introducing multi-hop instead of single-hop communication of each node with the sink. Simulation results show that the proposed energy balancing protocol reduces the transmission energy usage by up to 64%, while the reception energy usage is reduced up to 67%. Moreover, the system throughput as well as the network lifetime increased up to 79% and 66%, respectively.

Keyword: Wireless sensor networks; Energy balancing; Energy saving; Lifetime