

Fuzzy Logic-based Routing Algorithm for Lifetime Enhancement in Heterogeneous Wireless Sensor Networks

ABSTRACT

Energy consumption of sensor nodes is a key factor affecting the lifetime of wireless sensor networks (WSNs). Prolonging network lifetime not only requires energy efficient operation, but also even dissipation of energy among sensor nodes. On the other hand, spatial and temporal variations in sensor activities create energy imbalance across the network. In this paper, we propose a Distributed Energy-aware Fuzzy Logic based routing algorithm (DEFL) that simultaneously addresses energy efficiency and energy balancing. Simulation results demonstrate that the network lifetime achieved by DEFL exceeds the best of all tested solutions under various traffic load conditions. We further numerically compute the upper bound performance and show that DEFL performs near the upper bound.

EXISTING SYSTEM

- We propose a novel Distributed Energy-aware cost function based routing algorithm (DEFL) that uses Fuzzy Logic approach to improve network lifetime in dynamic network conditions.
- We provide a generic framework for designing energy-related cost functions.
- Our algorithm includes energy consumption rate and node remaining energy metrics in its cost function.

PROPOSED SYSTEM

- We propose a heuristic Distributed Energyaware Fuzzy Logic based routing algorithm (DEFL) to significantly improve the network lifetime of wireless sensor networks with heterogeneous nodes and variable traffic loads.
- Our algorithm is based on shortest path routing strategy with minimum cost.
- This strategy permits distributed implementation where each node gathers only local information to make independent routing decisions. This approach greatly reduces the communication cost and improves scalability.

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS

- Processor - Intel core i3
- RAM - 2B
- Hard Disk - 20 GB

SOFTWARE REQUIREMENTS

- Operating System : LINUX
- Tool : Network Simulator-2
- Front End : OTCL (Object Oriented Tool Command Language)

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