Energy Efficient Algorithm for Wireless Sensor Networks using Fuzzy Logic

Abstract

The network lifetime is an important issue for employing wireless sensor networks in space and extreme environments. This is due to the fact that the sensing node energy is mainly consumed by transmissions. For maximizing the network lifetime in this paper a multi-hop clustering algorithm using the fuzzy logic improvement methods is introduced. The cluster heads nodes selection is based on four descriptors; residual energy as primary parameter, node proximity to its neighbors (centrality), distance to base station and node concentration. The proposed multi-hop communication in cluster nodes and between cluster heads reduces the consumption of energy in the network. The results of proposed algorithm are compared with LEACH, TLCP and EHEED algorithms in MATLAB environment. The three metrics FND (first node die), HND (half node die) and LNA (last node alive) show the efficiency of proposed algorithm for the network lifetime.

References

Processing , Salt Lake City, UT.

Index Terms

Computer Science Wireless
Keywords
Sensor networking; fuzzy logic; lifetime; multi-hop communication; clustering