

A scheduled activity energy aware distributed clustering algorithm for wireless sensor networks with nonuniform node distribution

ABSTRACT

Nonuniform node deployment makes the cluster-based routing protocol less efficient in wireless sensor networks (WSNs). Energy aware distributed clustering (EADC) is one of the cluster-based routing protocols proposed for networks with nonuniform node distribution, which can effectively balance the energy consumption among the nodes. However, due to the nonuniform node distribution, there is a redundancy in sensed and transmitted data in dense area. This unnecessary energy consumption is not considered in EADC. Therefore, in this paper, a new algorithm called scheduled activity EADC (SA-EADC) is proposed. SA-EADC exploits the redundant nodes and turns them off for the current round. The redundant nodes are scheduled based on their residual energy to work alternatively. The results show that SA-EADC significantly decreases the energy consumption and extends the network lifetime without degradation in coverage and sensing reliability of the network.

Keyword: Node deployment; Non-uniform node distributions; Wireless sensor network (WSNs); Scheduled activity EADC (SA-EADC)