Energy Efficient Directed Region Based Cooperative Communication for Prolonging the Lifetime of Clustered Wireless Sensor Networks

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Abstract
Wireless Sensor Networks (WSN) are self-organizing systems consisting of tiny, battery-powered sensor nodes with limited processing, storage, and communication capabilities that are often deployed in very harsh and inaccessible environments in order to gather data about some phenomenon from the outside world. The cluster-based architecture is an efficient way for extending the lifetime of a WSN. The message transfer between two cluster heads consumes more power than between a cluster head and an intermediate node, as the distance of communication is greater in former. The power consumption of a node can be lowered by passing messages through intermediate nodes, i.e., cooperative communication and hence prolonging the network lifetime. The network lifetime can further be enhanced by restricting the area of flooding by a node, to find the next hop. Our proposed method defines the region of flooding depending on the location of the source node and the destination node, in a cluster grid-defined network. Flooding in a small area is observed to be far more power economic than flooding in the entire cluster for prolonging the network's lifetime. Partitioning the destination cluster grid into different sizes of subclusters depending on the location of destination node is more power economic as well as useful for faster communication as compared with existing algorithms that have been further confirmed by the simulation result and by analysis.

References

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**Index Terms**

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**Keywords**

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