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Abstract

Wireless Sensor Networks (WSNs) are resource-constrained systems. Efficient use of resources especially, energy is most important for their lifetime extension. Clustering of sensor nodes is a well-known approach for achieving high scalability and efficient resource allocation in WSN. We propose a dynamic, distributive, and self-organizing algorithm that utilizes a simplified clustering approach to organizing the WSN into two-level of the hierarchical network. We consider three-level energy heterogeneity of sensor nodes and takes the advantage of the local information such as residual energy, a number of neighbors and distance to the base station as criteria for CH election and cluster formation. Simulation results show that compared with the existing three-level energy heterogeneity based clustering algorithms, our algorithm can achieve longer sensor network lifetime.

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Index Terms

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Keywords

Wireless sensor networks, Clustering, self-organizing, distributive, three-level energy heterogeneity