Improved-Coverage Preserving Clustering Protocol in Wireless Sensor Networks

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Abstract

Coverage maintenance for longer period is crucial problem in wireless sensor network (WSNs) due to limited inbuilt battery in sensors. Coverage maintenance can be prolonged by using the network energy efficiently, which can be done by keeping sufficient number of sensors in sensor covers. There has been discussed a Coverage-Preserving Clustering Protocol (CPCP) to increase the network lifetime in clustered WSNs. It selects sensors for various roles such as cluster heads and sensor cover members by considering various coverage aware cost metrics. In this paper, we propose a new heuristic called Improved-Coverage-Preserving Clustering Protocol (I-CPCP) to maximize the total network lifetime. In our proposed method, minimal numbers of sensor are selected to construct a sensor covers based on various coverage aware cost metrics. These cost metrics are evaluated by using residual energy of a sensor and their coverage. The simulation results show that our method has longer network lifetime as compared to generic CPCP.

Keywords: sensor networks, energy-efficiency, clustering, network lifetime, coverage

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