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When sensors are redundantly deployed, a subset of sensors should be selected to actively monitor the field (referred to as a "cover"), while the rest of the sensors should be put to sleep to conserve their batteries. Despite of its potential application, wireless sensor network encounters resource restrictions such as low computational power, reduced bandwidth and specially limited power resource. In this paper we propose learning automata based algorithm for energy-efficient monitoring in wireless sensor networks. Learning Automata are used for choosing the nodes having redundant coverage contribution. The proposed monitoring method in comparison to existing methods uses less number of nodes for monitoring network area. To evaluate the performance of the proposed algorithm several experiments have been conducted. The simulation results establish that the monitoring of sensor nodes with the proposed technique shows better utilization of the resources that effectively leads to an energy efficient maximally covered sensor network topology. Experiments have also shown that the proposed monitoring algorithm in compar¬ison to other existing methods prolongs the network lifetime.

Index Terms:
Wireless sensor networks, Area coverage, energy-efficient, Learning Automata (LA)

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