"Immune Node Deployment Algorithm for Mobile Wireless Sensor Networks with Limited Mobility based on Probabilistic Sensing Model"

Mohammed Abo-Zahhad, Sabah M. Ahmed, Nabil Sabor and Shigenobu Sasaki

Abstract:

Coverage has direct effect on the network performance, thus it considered as the measure of quality of service in WSNs. The deployment strategy of sensor nodes in the sensor field is the most critical factor related to the network coverage. So, in this paper a centralized deployment algorithm based on immune optimization algorithm is proposed to improve the coverage of mobile sensor networks. The proposed algorithm redeploy the random deployed sensor nodes to maximize the coverage area based on a probabilistic sensing model. Moreover, the proposed algorithm limits the moving distance of mobile sensor nodes to reduce the dissipated energy in mobility and to ensure the connectivity among the sensor nodes. The performance of the proposed algorithm is compared with the CSAPO algorithm using MATLAB simulation. Simulation results show that the proposed algorithm outperforms the CSAPO algorithm in terms of the network coverage, mobility cost and convergence speed.

Keywords:

Wireless Sensor Network; Immune Optimization Algorithm; Coverage Problem; Nodes Deployment; Coverage Holes Problem.

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