

Jordan University of Science and Technology

Hierarchical Clustering Using Genetic Algorithm in Wireless Sensor Networks

Authors: Mohammad M. Shurmn, Mamoun F. Al-Mistarihi, Amr N. Mohammad, Khalid A. Darabkh, and Ahmad A. Ababnah

Abstract: Wireless sensor networks consist of a large number of sensors whereas each sensor is equipped with a life-limited battery. Depletion of this energy depends on not only the long-distance communications between the sensors and sink node, but also the active state period length. Power consumption of each sensor is the most important factor that affects the network lifetime severely. In other words, decreasing the long-distance exchanges between sensors and sink node leads to prolong the network lifetime and increase the network performance. Clustering method is considered one of the best well-known approaches that efficiently helps in increasing the overall network lifetime. In this paper, we incorporate genetic algorithm (GA) with hierarchical clustering for the sake of reducing the long-distance communications. Simulation results are extremely promising and show significant improvements over heuristics and normal genetic algorithms.