

Prolonging lifetime of wireless sensor networks with mobile base station using particle swarm optimization

Abstract

Wireless sensor networks are a family of networks in wireless communication system and have the potential to become significant subsystem of engineering applications. In view of the fact that the sensor nodes in wireless sensor networks are typically irreplaceable, this type of network should operate with minimum possible energy in order to improve overall energy efficiency. Therefore, the protocols and algorithms developed for sensor networks must incorporate energy consumption as the highest priority optimization goal. Since the base station in sensor networks is usually a node with high processing power, high storage capacity and the battery used can be rechargeable, the base station can be utilized to collect data from each sensor node in the sensing area by moving closer to the transmitting node. In this paper, we proposed an energy-efficient protocol for the movement of mobile base station using particle swarm optimization (PSO) method in wireless sensor networks. Simulation results demonstrate that the proposed protocol can improve the network lifetime, data delivery and energy consumption compared to existing energy-efficient protocols developed for this network.