

Article Abstract

Title:	Solving the K-of-N Lifetime Problem by PSO
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Abstract:	In wireless sensor networks, application nodes (ANs) may be produced by different manufacturers and may own different data transmission rates, initial energies and parameter values. When different kinds of ANs exist in a wireless network, it is hard to find the optimal base-station (BS) locations for minimizing power consumption and prolonging network lifetime. In this paper, a heuristic algorithm based on PSO is thus proposed to solve the K -of- N lifetime problem under general power-consumption constraints in wireless sensor networks. Give N ANs, the network survives as long as there are at least K ANs alive. The proposed approach can search for nearly optimal BS locations in heterogeneous sensor networks, where application nodes may own different data transmission rates, initial energies and parameter values. Experimental results also show the good performance of the proposed PSO approach and the effects of the parameters on the results. The proposed algorithm can thus help maximize the K -of- N network lifetime in wireless sensor networks.
Keywords:	Wireless sensor network, network lifetime, energy consumption, particle swarm optimization