

CH Selection Using the Sooty Tern Optimization with Dijkstra Algorithm for Wireless Sensor Networks

Authors: Mahmoud A. Khodeir, Jehad I. Ababneh, Bara'ah S. Alamoush

Abstract: Wireless sensor network (WSN) consists of distributed and resources-restricted sensor devices. The main and crucial restriction is on the available energy for each sensor which drastically affects the network performance. Many clustering techniques have been proposed to save energy and consequently improves the performance of WSN. In this paper, the sooty tern optimization algorithm (STOA) is proposed to solve the cluster head (CH) selection problem in WSN. The used fitness function employs different network parameters that have been proved to affect significantly the performance of WSN. To achieve further enhancement, the Dijkstra algorithm is also implemented after the selection of the best CHs as a routing protocol to reduce the energy consumption by finding the best path from CHs to the BS. The proposed algorithm is subjected to extensive simulations and tests under many different conditions. The performance of the proposed algorithm is compared to that of many reported clustering algorithms. The comparison revealed that the proposed algorithm outperformed all other algorithms in terms of energy consumption, network lifetime, and packet count