Establishing an energy efficient wireless sensor network is a challenging task. A significant amount of research work has already been carried out in this direction to study energy optimization in WSN by taking the advantage of mobile sink or mobile agents. Many approaches using mobile sink have demonstrated that energy usage can be optimized significantly in the phenomenon area from where the sink would collect the sensed readings from the sensor nodes via single or multi hop communication. But, the slow mobility speed of the sink will tend to increase the data collection latency in the sensor network, especially in delay bound WSN applications. To overcome this problem, several rendezvous based techniques have been proposed, in which sink is allowed to visit a subset of the sensor nodes to collect the data via single hop communication. This subset of nodes, called rendezvous points (RPs), is considered as data collection points. All other nodes send their sensed data using the shortest path to these RPs. In this paper a simple neighbourhood based rendezvous technique is proposed. In our approach a subset of sensor nodes from the network is designated as rendezvous points (RPs) set to receive and buffer the data from their nearest source nodes. The selected RP set is such that they take care of denser part of the network where energy
consumption is more so that the energy hole problem can be minimized and help optimize the energy consumption in the network. A shortest sink tour is then constructed using only RPs, using which mobile sink makes its tour and collects the buffered data from the RPs within a given deadline. In this paper we explain the NBWRP (Neighbourhood based Weighted Rendezvous Planning) algorithm to compute the RPs. We also evaluate and compare its performance with static sink WSN and WSN with random sink mobility. Our results show that the algorithm achieves better WSN lifetime compared to static sink case and random movement strategy.

References

- Guoliang Xing, Tian Wang, Weijia Jia and Minming Li, "Rendezvous design algorithms for wireless sensor networks with a mobile base station"; ACM Press, Hong Kong, China, 2008.
Energy Optimization using Neighborhood based Weighted Rendezvous Technique for Wireless Sensor Networks


Index Terms

Computer Science

Wireless
**Keywords**

Wireless Sensor Network (WSN)  Mobile Sink  Controlled Mobility  Rendezvous Point  Energy optimization.