Abstract

Effective data fusion principally prolongs the survival of a Wireless Sensor Network (WSN) and largely determines the degree of its performance in terms of energy utilization. In our research work, we propose a data fusion protocol based on clustering technique. The protocol computes the correlation-dominating set by exploiting spatial and temporal correlation among the data.
sensed by the sensor nodes in the network. On the basis of the dominating set the network correlation graph is derived, which is further applied to form clusters. Moreover, an efficient energy model is taken into consideration for electing a sensor node from the dominating set as the cluster head. Finally within a cluster, the cluster head aggregates data from the remaining dominating nodes and transmits them to the data processing node. It can be observed that with the application of correlation and aggregation in our protocol, the size of the set of actually transmitting nodes is reduced significantly. We have used Network Simulator (ns-2.34) to simulate our work. The results are obtained in terms of three metrics: energy consumption, success rate and network lifespan. The results are obtained by taking average of five runs, to ensure precision in the experimentation.

Reference

- Fall, K. and Varadhan, K. The NS Manual.

Index Terms

Computer Science Wireless
Key words

Connected correlation dominating set
network correlation graph
BF-hypergraph
data correlation and covariance
data aggregation