Abstract

Wireless Sensor Networks (WSN) usually contains thousands or hundreds of sensors which are randomly deployed. Sensors are powered by battery, which is an important issue in sensor networks, since routing consumes a lot of energy. Such nodes are deployed in thousands to form a network with capacity to report to a data collection sink (base station). An efficient routing scheme in sensor network is also important. Networking unattended sensor nodes are expected to have significant impact on the efficiency of many military and civil applications such as combat field surveillance, security and disaster management. Genetic algorithm (GA) based data aggregation trees are used where the sensors receive data from neighboring nodes, aggregate the incoming data packets, and forward the aggregated data to a suitable neighbor. GA is used to create energy efficient data aggregation trees. In this work, the amount of data sent to sink is reduced using association rule mining and in turn to further reduce the energy consumption of the network; optimal routes are chosen to transmit data to the sink based on energy consumption. The proposed method is able to discover the association rules to make predictive analysis on node failure, asymmetric links. The rules found form the basis for coding solutions in the proposed genetic algorithm. GA is applied to generate balanced and energy efficient data aggregation spanning trees for wireless sensor networks. E-Span, which is an energy-aware spanning tree algorithm and Lifetime-Preserving Tree (LPT) are used to create
data aggregation trees. The proposed GA extends network lifetime.

References

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