CHAPTER 6

CONCLUSION AND FUTURE WORK

6.1 CONCLUSION

In this research work, various techniques include energy efficient double cluster head selection algorithm, double cluster head based reliable data aggregation and secure key-tree architecture for double cluster based routing in WSN. These techniques are used for enhancing the network lifetime by reducing the energy consumption and reducing the network overload, latency and packet drops along with data protection.

In chapter 1, the brief introduction about wireless sensor network, and its features, applications and issues, routing in wireless sensor network with its types and challenges, clustering and cluster head selection are discussed. Cluster based routing protocols and data aggregation with its types and issues in wireless sensor network are also explained that help in the proposed techniques. Finally, an overview on proposed work and thesis organization are proposed which indicate the chapters corresponding to the proposed techniques.

In chapter 2, the existing works on the double cluster head selection in WSN, data aggregation and security on cluster based routing protocols are discussed. By the study of the existing system, the limitations of the existing protocols are known and it creates a
motivation to propose a new technique. The conclusion provides the overall problem identified in the existing system.

Chapter 3 discusses about an energy efficient double cluster head selection algorithm for WSN. In this technique, two cluster heads namely main and sub-ordinate cluster heads are selected using particle swarm optimization technique. When a source node wants to transmit data to sink, energy efficient routing protocol is used based on the parameters such as the expected number of retransmissions and link failure probability. Each cluster member node sends the data to main cluster head. The aggregated data from the main cluster head are transmitted to sink through sub-ordinate cluster head. This technique enhances the network lifetime and reduces the network overload.

Chapter 4 discusses double cluster head based reliable data aggregation for WSN approach where the two cluster heads namely main and sub-ordinate cluster heads are selected based on the parameters such as residual energy, minimum average distance from the member, nodes timer and node degree using particle swarm optimization technique. Then a direct voting approach is implemented, where the nodes act as witness nodes which help the base station to verify the data and find if any node is affected in the network. This technique enhances the network lifetime by reducing the energy consumption and packet drops.
Chapter 5 analyses the secure key-tree architecture for cluster based routing in WSN where two cluster heads namely main and subordinate cluster heads are selected using particle swarm optimization technique. When a source node wants to transmit data, it is performed using a secured communication methodology. It involves inter and intra-cluster key generation. The data gathered in clusters are multicast between base stations and cluster heads by hop by hop encryption technique. This technique reduces latency and increases data protection.

While varying the number of nodes, data rate and simulation time, the performance evaluation of the proposed work depicts that it reduces the end-to-end delay, energy consumption and packet drop with increased packet delivery when compared to the existing techniques.

6.2 FUTURE WORK

The proposed work is implemented in static wireless sensor network. Due to the emergence of the mobile network, this work can be extended to operate in mobile sensor network. The issues that occur in case of mobile sensor nodes will be considered to obtain high performance. In addition to this, the work can be extended to multiple sinks also.
LIST OF PUBLICATIONS

International Journals


International Conference


