Trust based Energy Efficient Clustering using Genetic Algorithm in Wireless Sensor Networks (TEECGA)

Abstract

Wireless sensor networks are gaining lot of popularity because of its widespread applications. They consist of small sensor nodes that are low in battery and computational capability. Mostly these nodes are deployed in remote areas thus it's not easy to replace their batteries. In clustering process, clusters of the sensor nodes are formed. All the sensor nodes send the sensed data to their cluster heads and cluster heads forward the data to sink. Various techniques like fuzzy logic, neural networks, artificial intelligence and genetic algorithm etc can be used for clustering and cluster head selection in wireless sensor networks. Proposed system implements genetic algorithm based cluster head selection technique. The metrics used are residual energy, distance, number of sensor nodes, number of cluster heads and trust.

Proposed system also aims at ensuring successful delivery of the data and reliability by calculating trust of all the nodes. A node with low trust value will not be selected as a cluster head. In TEECGA, multihop communication between cluster heads is used i.e. every cluster head will send the data to its nearest cluster head and finally a single cluster head will send the data to sink node which results in enhanced network lifetime. From graphical and mathematical analysis, it is proved that the proposed system is more energy efficient than classical methods.
of clustering and is trust based.

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Index Terms

Computer Science

Wireless
Keywords

| Genetic Algorithm (GA) | Cluster Head (CH) | Clustering | Wireless Sensor Network | Sink node | (WSN) |