Abstract

Network lifetime and connectivity are the key parameters to guarantee quality of service (QoS). As a result, it becomes our topmost priority to preserve the energy of sensor nodes which have limited initial energy at the time of deployment and it is impossible to recharge the battery due to out of reach deployment. Heterogeneous wireless sensor network consists of more than one type of sensor nodes which differs from one another in terms of initial energy, computing power, performance, etc. In order to reduce unwanted energy dissipation and congestion during long distance data transmission, fixed number of relay nodes are selected and placed as a router to maintain connectivity. Relay nodes receive aggregated data from cluster head and send it back to base station. In this paper, we have proposed an (EDAC) Energy and Density Aware clustering scheme to optimize the selection and placement of cluster heads (CH) and relay Nodes (RN) to enhance the connectivity and network lifetime of network. The proposed centralized protocol enables the base station to select the cluster head and relay node on the basis of residual energy, distance from base station and relay node, node density, overlapping ratio of nodes, etc. The results of simulation using Matlab proves that our proposed algorithm, EDAC increases the overall connectivity, 100% coverage ratio by 80.21% and network lifetime
by 131.61%.

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**Index Terms**

Computer Science
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**Keywords**

Network Lifetime Connectivity Heterogeneous Wireless Sensor Network Energy Efficiency
Cluster Head
Relay Node
Routing
Static Clustering.
Energy and Density Aware Clustering (EDAC) to Improve Lifetime and Connectivity in Multi Level Heterogeneous Wireless Sensor Network