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An Improved Energy Efficient Clustering Protocol to Prolong the Lifetime of the WSN-Based IOT

The Internet of Things relies heavily on wireless sensor networks (WSNs) (IoT). However, the energy resources of sensor nodes in a WSN-based IoT network are restricted. By grouping nodes into clusters to reduce the transmission distance between sensor nodes and base stations, a clustering protocol offers an effective method for ensuring node energy savings and extending network lifespan (BS). Current clustering protocols, on the other hand, have problems with the clustering mechanism, which has a negative impact on their efficiency. We suggest an enhanced energy-efficient clustering protocol (IEECP) in this paper to extend the lifespan of WSN-based IoT devices. The proposed IEECP is divided into three parts. For the overlapping balanced clusters, an optimum number of clusters is first calculated. The balanced-static clusters are then developed using a tweaked fuzzy C-means algorithm in combination with a mechanism to minimize and balance the sensor nodes' energy consumption. Finally, cluster heads (CHs) are chosen in optimal locations by rotating the CH function among cluster members using a new CH selection-rotation algorithm that combines a back-off timer mechanism for CH selection and a rotation mechanism for CH rotation. The suggested protocol, in particular, eliminates and balances energy consumption. The proposed protocol, in particular, reduces and balances node energy usage by optimizing clustering structure, and IEECP is ideal for networks with a long lifespan. The findings of the assessment show that the IEECP outperforms current protocols.

Domain: Wireless Sensor Networks / Protocols

Technology: MATLAB