ABSTRACT

Sensor Network has played a contributory role in modern wireless and communication system. A series of dedicated research attempts has been witnessed in past decade to solve the issues pertaining to energy efficient communications in Wireless Sensor Network. However, the issue of energy efficient routing stays unsolved. Owing to limited computational capabilities of sensors with energy constraint, it is quite a challenging task to ensure that lifetime of a sensor is elongated for longer duration. This research proposes energy efficient scheme of communication in sensor network assisted by three different novel frameworks.

The proposed framework Potential Energy Efficient Data Fusion (PEE-DF) performs optimization of energy with aid of probabilistic technique using clustering. The Multiple Zone Data Fusion (MZDF) framework is designed using a globular topology that essentially assists in load balancing during the data fusion. The scheme introduces a novel routing technique that assist in performing an energy-efficient routing in large scale wireless sensor network. The proposed Tree-Based Fusion Technique (TBFT) framework introduces a novel dynamic reconfiguration scheme by introducing a concept of routing agents. The scheme allows the system to identify the sensor that has faster rate of energy dissipation and instantly switches the responsibility of data fusion to other energy efficient node. This threshold-based scheme allows a sensor to play both the role of cluster head till it reaches its threshold remnant energy and the role of member node after it crosses threshold remnant energy.

Owing to mathematical modeling using standard radio-energy model, the reliability of the outcomes is more promising. Compared with the existing standard energy efficient scheme, the proposed system has excelled energy-efficient communication performance. The outcome of the proposed system shows nearly 50% energy savings as compared to LEACH with faster execution time.