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SOECS: Scheduling based Optimal Energy Clustering Scheme for WSN

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Abstract: Balancing the energy consumption and location accuracy is one of the critical tasks in WSN. Energy consumption of sensor nodes is measured in terms of route discovery, packet forwarding and data transmission. In this research work, it is proposed that scheduling based Optimal Energy Clustering Scheme (SOECS) to attain the maximum location accuracy and energy efficiency during route maintenance. It consists of three phases. In first phase, the node deployment is done using Gaussian distribution function to route the packets effectively. In second phase, Cluster heads are chosen and energy is estimated for optimal cluster heads. In third phase, TDMA scheduling algorithm is introduced to improve the energy efficiency using stable routes and scheduling table. The work is evaluated using network simulation tool. The proposed scheme produces high performance than existing schemes.

Keywords: *Gaussian random distribution function, node deployment, energy efficiency, network lifetime, location accuracy and TDMA scheduling.*

1. Introduction

In past few decades, Wireless Sensor Networks (WSN) plays a vital role in wireless network and growth of WSN rises rapidly. The wider detection range and flexibility was provided effectively due to radio waves and sensor nodes. The real time environment changes are detected by sensor nodes [1]. The data gathering process is done by the sensor nodes and data aggregation is implemented to save the energy. Energy efficiency is the major issue in WSN and the consumption of energy can be measured based on various applications [2].

2. Previous Work

The distributed optimization issue for the energy of wireless sensor network. The nodes or the players completed the iterative solution to increase the energy utilization rate. Meanwhile the energy of WSN was improved with the new revenue model. Individual constraints were converted into players to provide better energy [3].

An energy efficient chain cluster based intelligent routing algorithm to extend the network lifetime [4]. The load distribution was enhanced with routing algorithm to improve network performance and energy efficiency. The Power Energy Gathering in Sensor Information Systems protocol and Ant Colony Optimization were integrated together to find the optimal chain in order to reduce the data redundancy , distance between intermediate nodes and delay of data transmission through longer length links.

The cluster head selection method was adopted to reduce the energy wastage on packet transmission during data communication [5]. The time division multiple access schedule was adopted to optimize the energy consumption. The progression of cluster head movement, energy conservation and packets transmission to the base station were monitored with LEACH protocol. In initial phase of the algorithm, stable cluster head was chosen to route the packets effectively.

Enhanced set of optimization rule with LEACH routing protocol to improve energy efficiency [6]. The concept of Particle Swarm Optimization algorithm was adopted to provide optimized clusters. The major inputs were the fitness functions, set of rules and residual energy estimation. The special CH was chosen based on average cluster energy, replacement of CH with least value of fitness function and hub density distribution.