UNIVERSITITEKNOLOGIMARA

EVEN-ODD SCHEDULING BASED ENERGY EFFICIENT ROUTING FOR WIRELESS SENSOR NETWORK (WSN)

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ABSTRACT

Several routing protocols have been developed and proposed in the literature for the development of energy-efficient routing strategies of Wireless Sensor Networks. The necessity of saving energy is primarily the need of technology and scarcity of energy limited resources of wireless sensor network. Wireless Sensor Network (WSN) is basically composed of battery powered devices which have an obvious limitation of energy on sensors nodes, so it is the foremost motivation to develop a method to save energy of wireless sensor networks where networks are kept alive for a long time. The aim of this research is to design and develop a routing protocol, which uses less energy through its efficient structural organization and methodology, and keeps the sensor network alive for a longer time. To achieve the task of a longer network lifetime and higher average node energy, we have proposed an energy-efficient routing protocol motivated from the concept of well-known Low Energy Adaptive Cluster Hierarchy routing algorithm also known as LEACH, and optimized it with the concept of alternate hitting, which means the even-odd scheduling-based routing. The proposed routing protocol known as the Even-Odd Scheduling-based LEACH or simply EOS-LEACH is the main contribution for this research. This method indexes nodes evenly and oddly during the transmission of data. The goal behind this scheme is to keep node standby for one subsequent round after data transmission or when it is ready to send data, this will save the energy of node which send data frequently. If any node which is not in the queue or doesn't have data will not consume any significant energy and thus entire network saves energy after each transmission round. The performance of the proposed routing algorithm has been evaluated through simulations of well-known software MATLAB. Using the simulation software, it was observed that the alive nodes are higher in numbers i.e. 189 nodes after 500 rounds for the proposed routing algorithm compared to the previous methods which had only 150 alive nodes. It was also observed that the proposed routing algorithm outperforms the LEACH in network lifetime with 1697 rounds as compared to the original LEACH of with just 803 rounds. In addition, the network performance has also increased by using the proposed routing algorithm with a throughput of 147.8207 as compared to just 46.0472 with the original LEACH. In future, the proposed algorithm can be further enhanced with data aggregation efficiency, probabilistically election of cluster heads, and other energy-consuming parameters.

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