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Distanced Based Routing For Wireless Sensor Network

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ABSTRACT: Wireless Sensor Networks is a Wireless network consists of multiple detection stations called sensor nodes and more number of wireless sensors in order to monitor temperature, pressure, motion etc., in different environment conditions because Wireless sensor systems are generally utilized as a part of the business and modern territories. Number of sensor nodes located geographically nearer to form a group called cluster to processing the data. Distance based routing protocol is a routing protocol for clusters which is used to lower the energy consumption and also to improve the lifetime of the wireless sensor networks. Minimizing energy dissipation and maximizing network lifetime are important issues in the design of applications and protocols for sensor networks. We propose algorithm where we will be selecting at least two nodes from each cluster to become the cluster and perform all communication via this cluster head. The main advantage of this protocol over the existing protocol is that this protocol has a backup of cluster head which when the current cluster head has lost enough energy, thereby further improving the lifetime of the network.

KEYWORDS: Distance Based Routing, Wireless Sensor Networks (WSNs), Clustering.

I. INTRODUCTION

A Wireless sensor network can be defined as a network of devices that can communicate the information gathered from a monitored field through wireless links. The data is forwarded through multiple nodes, and with a gateway, the data is connected to other networks like wireless Ethernet. A sensor network consists of multiple detection stations called sensor nodes, each of which is small, lightweight and portable. Every sensor node is equipped with a transducer, microcomputer, transceiver and power source. The transducer generates electrical signals based on sensed physical effects and phenomena. The microcomputer processes and stores the sensor output. The transceiver receives commands from a central computer and transmits data to that computer. The power for each sensor node is derived from a battery.

The utilization of wireless sensor systems are expanding step by step and in the meantime, it confronts the issue of vitality limitations as far as constrained battery lifetime. As every hub relies on upon vitality for its exercises, this has SPINed into a noteworthy issue in wireless sensor systems. The disappointment of one hub can interfere with the whole framework or application. Each detecting hub can be in dynamic (for accepting and transmission exercises), sit out of gear and rest modes. In dynamic mode nodes devour vitality when accepting or transmitting information. Out of gear mode, the nodes expand nearly an indistinguishable measure of vitality from in dynamic mode, while in rest mode, the nodes shutdown the radio to spare the vitality.

Every one of the conventions that are planned and actualized in WSNs ought to give some constant help as they are connected in ranges where information is detected, prepared and transmitted in view of an occasion that prompts a quick activity. A convention is said to have constant help if and just on the off chance that it is quick and solid in its responses to the progressions winning in the system. It ought to give excess information to the base station or sink

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utilizing the information that is gathered among all the detecting nodes in the system. The postponement in the transmission of information to the sink from the detecting nodes ought to be short, which prompts a quick reaction.

II. LITERATURE REVIEW

Manomi K S, Vinutha C B, M Z Kurain [1]: In this Paper Wireless Sensor Network is finding its application in various fields and is becoming very popular. Data communication in WSN should be supported by the limited resources of the nodes. Clustering of nodes in wireless sensor networks increases the scalability of the network and energy conservation. Data aggregation using ANN technique increases the network lifetime and throughput by eliminating the defected node. More efficient energy balancing technique should be devised to conserve nodes battery energy and result with improved network lifetime.

C. P. Subha, Dr. S. Malarkan, K Vaithinathan [2] : In this paper It has been observed that the improvement in network varies according to the network topology. From the survey it has been observed that ART 1 is better than ART and the improvement in lifetime in ARTI is consistently around 45%. The maximum network lifetime improvement is found to be 47%. This effectively improves the bandwidth of the communication channel and also reduces the energy consumption The Fuzzy ART neural network is self-learning, processes any input sequentially, needs no buffering of samples, and adapts to both, changing environmental conditions and new evolving signals. Finally, the high compression rate lowers communications costs. Self organized mapping which is trained on sample two dimensional data collected from various active nodes which results enormous energy saving which is around 48.5%. This paper presented a classification for the most important applications of neural networks in energy efficiency of WSNs depend on different research studies have been done so far. The most important application of neural networks in WSNs can be summarized to sensor data prediction, sensor fusion, path discovery, sensor data classification and nodes clustering which all lead to less communication cost and energy conservation in WSNs. The classification for neural network based methods by Self Organizing Maps has been found to be providing good performance than the ART, ART!, FUZZY ART and NBEF for the purpose of energy conservation of nodes, and also shows more applications in recent WSN platforms.

Rong Du, Carlo Fischione, Ming Xiao [3] : In this paper, we investigated the problem of schedulingthe wireless energy transfer in wireless sensor networks to prolong network lifetime. We studied the requirement on energy transfer efficiency and the packet generation rate such that the network can be immortal. For larger network sizes or packet generation rates, we studied the lifetime maximization problem and proposed a solution algorithm. We showed that the algorithm achieves an optimal schedule, when the ratio of the received energy at a sensor node to the transmitted energy at the base station is low.

Walid Mourad, Ben Bella S. Tawfik, Imane Aly Saroit, Hesham N. Elmahdy, Tarek Salah El Habian [4] : In this work we proposed Energy control protocol through SOM neural networks. This protocol applies energy levels and coordinates of nodes as clustering input parameters. It uses some nodes with maximum energy levels as weight vectors of SOM map units. The clustering phase is performed by a two phases namely, SOM, and K-means clustering method. Also in the proposed model changing the number of cluster in final phase (k-mean phase) has a great influence on the result, in another words chose 20 clusters which is close to LEA2C and 10 clusters selection are proposed. The simulation results show 45% Profit of our algorithm over LEACH in the terms of increasing first dead time and also using 10 clusters gives 10% profit over using 20 clusters and also simulation results show the profit over LEACH in the terms of reserved energy in network then changing the number of nodes is direct proportion to number of live nodes.

M. K. Praveen, Mr. T. Senthil [5]: Energy Consumption is a main factor in designing wireless sensor networks. During clustering scheme, While LEACH is a most popular routing protocol and Distributed Energy Efficient Clustering (DEEC) which can be used in the existing approach, but in the proposed approach, we used an ABC (Artificial Bees Colony) optimization technique. By using the ABC optimization technique, we effectively designed the CH which is closest to the BS. Energy in the farthest node (i.e, far away form CH) can get optimized using ABC optimization technique. By doing this lifetime of the nodes in the wireless sensor networks can get increased. The simulation results shows that the proposed ABC technique is more efficient than the existing DEEC technique.

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III. PROPOSED METHODOLOGY

- Network formation and communication.
- Selection of cluster heads for communication.
- Selection of cluster of cluster head for energy efficiency

The main objective of statistical learning is to find a description of an unknown dependency between measurements of objects and certain properties of these objects. The measurements, also known as "input variables", are assumed to be observable in all objects of interest. On the contrary, the properties of the objects, or "output variables", are in general available only for a small subset of objects. The purpose of estimating the dependency between the input and output variables is to be able to determine the values of output variables for any object of interest. In pattern recognition, this relates to trying to estimate a function f:R^N 7→ {±1} that can correctly classify new examples based on past observations. Distance Based routing are one of the most popular classification algorithms to perform such tasks and are well known for their strong theoretical foundations, generalization performance and ability to handle high dimensional data. In proposed methodology first initialize value for each of the cluster then select the cluster Head of each cluster division based on E/D formula and check node with highest score in the current cluster division. After that connect the nodes

In Below figure, we have demonstrated three paths which can be used but all these depend upon the distance energy and delay required by the system. We have to select the best path which is done by proposed method.

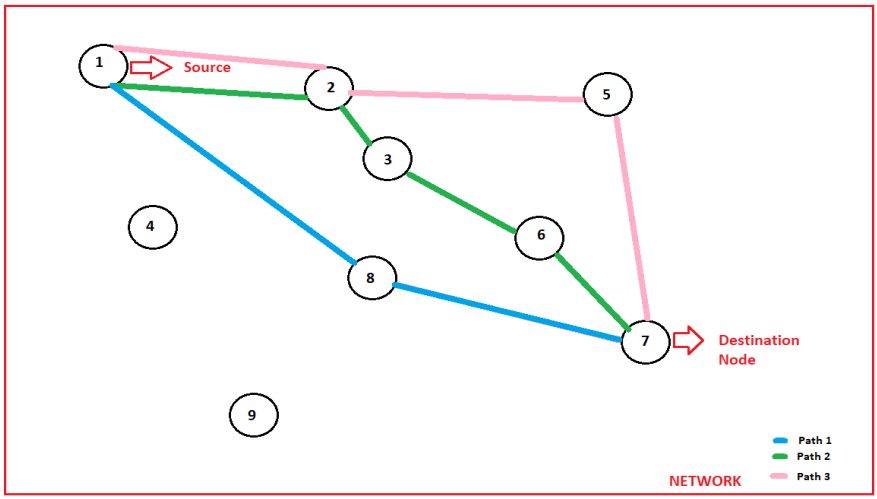

Figure III.1: Figure showing Different Paths in the network.

IV. RESULTS AND COMPARISON

The total time required by the processes of sending and receiving the data comes under delay parameters. The delay is calculated by adding the time required for various operations such as the request, finding the optimal path, sending data and receiving data.

Following Graph and Table shows the comparison between the existing protocol & proposed protocol. As observed from the following Graph and Table we can summarize that the delay required in communication is less.

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Table IV.1: Comparison of delay for Existing Protocol & Proposed Method

No Of Communication	Existing Protocol	Proposed Method
1	0.000908	0.000709
2	0.000831	0.000517
3	0.000847	0.000638
4	0.000837	0.000602
5	0.000844	0.000639

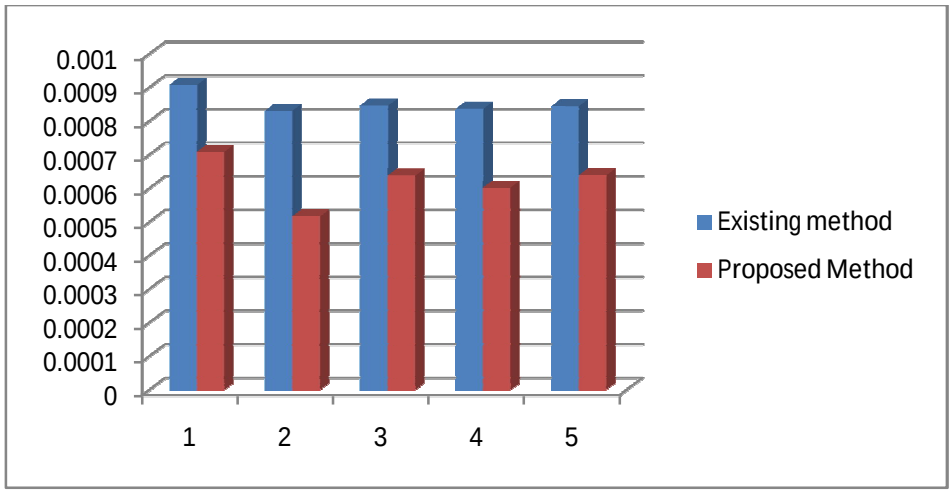

Figure IV.1: Delay V/s Communication for Existing and proposed method system.

V. CONCLUSION

In the current proposed work, we are proving that cluster based performs better communication routing than other protocols. It reduces the energy consumption thus the network lifetime increases. The delay of communication is reduced, thus increasing the speed at which communication takes place, thereby reducing the number of re-transmissions. Overall the network routing efficiency has been improved and the overall network performance has been increased

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