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To Analyze & Enhance Drina in Dynamic Clustering Using Knowledge Based Learning for WSN

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Abstract :- In previous searches many researches had done work on energy consumption problem. They use different techniques to minimize energy consumption, like clustering, re-girding etc. The energy consumption of wireless nodes is depends upon the transmission distance, optimal routing protocols and amount of data to be transmitted. Energy consumption is the major problem, in this paper we are decreasing the energy consumption to implement a novel approach and compare these results with the exiting technique named DRINA [1]. The concept, which is implementing on exiting technique, is neural network approach. In neural networks weights can be adjusts easily by applying some algorithms. This concept becomes key point in our work also. Here we adjust nodes not weights according the sending capacity of those nodes for communication.

The node which has the higher sending capacity (means higher battery backup) as compare with other nodes in a cluster that node becomes the cluster head of a cluster. In a cluster one node should be act as a cluster node only. There is only one cluster head present in a cluster and number of cluster heads is present in a network, so, that's why, we are also working on cluster head selection.

Keywords:- *Wireless Sensor Network, Energy consumption, Dynamic Clustering.*

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1. INTRODUCTION

Wireless sensor network (WSN) is a network of small light weighted wireless nodes which are highly distributed and deployed in large numbers. Wireless sensors networks monitor the system or environment by measuring physical parameters such as humidity, pressure and temperature. Wireless sensor networks provide an economic approach for to deployment of the control devices and to avoid the expensive wired system. WSN is a self healing and self organizing:-

Self-healing networks: - allow nodes to reconfigure their link associations and find other pathways around powered-down nodes or failed nodes**.**

Self organizing: - allow a set of connections automatically tie new node without the need for-manual-interference.

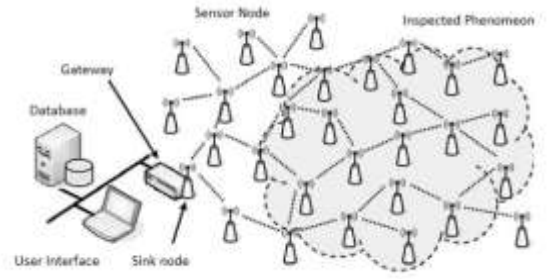

Figure 1.1: Wireless Sensor Network [4].

Wireless sensor is a computer network which is collected of a more number of sensor nodes. Sensor nodes are those which are able of sensing environment around them. Sensor nodes are devices which are able of gathering, storing, sensing and transmitting information. Sensor nodes can be deployed any place without install it. The gathered information can be retrieved. Wireless sensor network is a term which is used to describe an emerging class of embedded communication products that provide fault-tolerant wireless connections between sensors, controllers and actuators. A wireless sensor network consists of a large number of nodes spread over a particular area. The sensor field is organized in the form of a grid. The grid is formed in the form of square cells. Each square cell has number of sensor nodes. A request from the sink with sensor node sends to the source. The multiple sink could be present at any place in the sensor field. One of the most important constraints on sensor nodes is the low power consumption requirement. Sensor nodes carry limited power resources that are irreplaceable .The traditional networks aim to achieve high quality of service provisions. The main focal point of sensor networks is on low power conservation. It has the advantage of robustness. It provides the feature of scalability i.e. can be expanding from smaller network to larger network. It can add device at any time. Through centralized monitor it can be accessed. It is flexible in nature.

2. PERFORMED WORK

Many researches had done work on energy consumption problem. They use different techniques to minimize energy consumption, (Leach, Infra, and Drina), etc. The energy consumption of wireless nodes is depends

upon the transmission distance, optimal routing protocols and amount of data to be transmitted. Energy consumption is the major problem, in this paper we are decreasing the energy consumption to implement a novel approach and compare these results with the exiting technique named DRINA [1]. The concept, which is implementing on exiting technique, is neural network approach. In neural networks weights can be adjusts easily by applying some algorithms. This concept becomes key point in our work also. Here we adjust nodes not weights according the sending capacity of those nodes for communication.

The node which has the higher sending capacity (means higher battery backup) as compare with other nodes in a cluster that node becomes the cluster head of a cluster. In a cluster one node should be act as a cluster node only. There is only one cluster head present in a cluster and number of cluster heads is present in a network, so, that's why, we are also working on cluster head selection.

3. RESULTS AND DISCUSSION

3.1. Problem Formulation

3.1.1. Network Deployment.

The wireless sensor network is deployed with the fixed number of sensor nodes and each node has sensing capability.

3.1.2. All the nodes start communicate with their neighbor nodes.

In this each and every node in the network with communicates with their adjacent node and exchanges their battery information.

3.1.3 Cluster head selection.

The nodes in the network will choose their cluster head on the basis of battery power. The nodes have higher battery will be selected as the cluster head. The network will be rearranged and clustering will be done in the network

3.1.4 Selection of cluster head of that node randomly.

The cluster heads are selected from the network. The dynamic cluster is used, to cluster of sensor nodes. When the event is detected by the sensor node, it passes the sensed information to the nearest cluster head.

3.1.5 Communication between cluster heads.

Any information which is sensed by nodes is passed to cluster head. The communication between cluster heads will start and through cluster heads communication the information will pass to sink.

3.1.6 Link failure due to one cluster head,s battery low.

In this work dynamic clustering technique had been applid for clustering. The cluster head will communicate with each other to pass information to sink. In dynamic clustering the cluster heads are chosen randomly due to which the battery of the sensor nodes get degrade and packetloss happed in the network. By this particular problem lots of terms are affected in next section we are going to discuss this, if one node degrades due to battery powers down, so, in next we proposed enhancement in exiting technique to sort out this problem.

3.2. SOLUTION OF THE PROBLEM

3.2.1. Solution of that particular problem

In this section, we will discuss are proposed enhancement which one helpful to overcome or decrease this problem and compare the results with exiting technique.

When two nodes communicate to each other, one node stops working because of its battery goes down, in this term lots of data wasted and we have to resend the previous data also, by this the node gets more energy to resend this data with fresh data.

To solute this problem we use neural network (knowledge based learning) concept, in this concept we adjust nodes according the sending capacity of those nodes for communication. By this node will change the path before the battery degrades. We define the threshold level for the nodes when the node battery goes down this level

It will change the path (means select the other shortest path to the sink).

In further we compare these results with exiting technique with the help of graphs.

3.3. RESULTS GRAPHS

3.3.1. Delay between proposed enhancement and exiting technique:-

Proposed enhancement has less delay as compared to the exiting technique the time difference between packet send and received. The red line shows exiting technique and green line shows proposed enhancement.

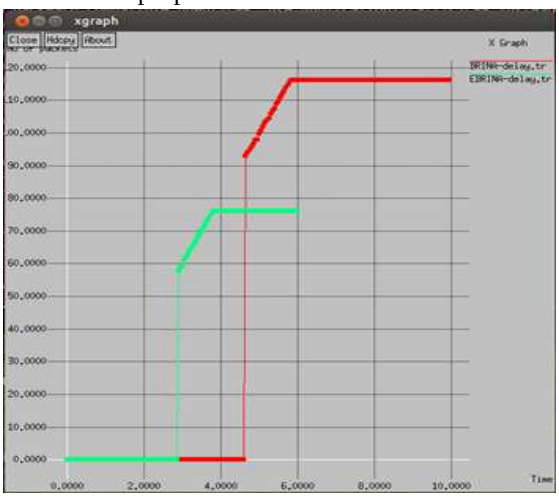

Figure 3.3.1: Delay between proposed enhancement and exiting technique

Above figure shows that existing technique has more delay as compare to proposed enhancement. This concluded that proposed enhancement is better than existing technique.

Table 3.3.1: Comparison of Delay between exiting technique and proposed enhancement

Number of packets	Packet Delay in Existing technique (in sec)	Packet Delay in Proposed Enhancement (in sec)
10.000	4.8	2.8
76.000	4.9	3.9
92.000	5.8	3.9

The delay to transmit data from source to destination data is calculated in old and proposed enhancement with respect to time. The network delay is more in the previous scenarios. The network delay is reduced in the new scenario.

3.3.2. Throughput of proposed enhancement and exiting technique:-

In this network is the average rate of flourishing message delivery over a communication channel.

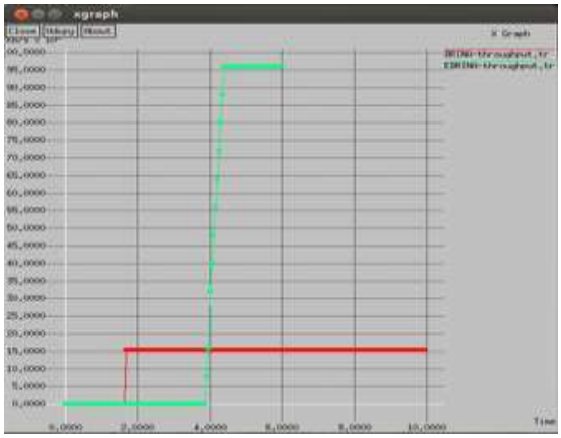

Figure 3.3.2: Throughput of proposed enhancement and exiting technique

Table 3.3.2: Throughput of proposed enhancement and exiting technique:-

Time in seconds	Exiting technique	Proposed Enhancement
3.000	18	0
5.000	18	0
6.000	25	10
7.000	25	28
8.000	25	41

The network throughput is more in the proposed enhancement scenario. The throughput with the proposed enhancement scenario is constant in the beginning and increases with a sharp value after a certain interval of time. But in the exiting technique after certain interval of time the throughput of exiting technique is constant after small hike. Thus, this shows that the proposed enhancement is better than exiting technique.

3.3.3. Energy consumption between proposed enhancement and exiting technique:-

This graph shows that proposed enhancement method has less energy consume as compare to exiting technique.

Figure 3.3.3: Energy consumption between proposed enhancement and exiting technique

Table 3.3.3: Comparison of energy consumption in proposed enhancement and exiting technique:-

Time (in seconds)	Exiting technique (In joules)	Proposed Enhancement (In joules)
3.900	17	2
4.000	11	3.2
4.200	20	7.6
4.300	43	10
4.400	34	11

The energy consumption in proposed enhancement is less as compare to exiting technique.

4. CONCLUSION

In this work, novel technique is been proposed which is based on neural network. To reduce the energy consumption, delay in packets receive in dynamic clustering and to increase lifetime of the sensor network, cluster heads are changed using the approach of neural network technique like will be applied Knowledge Based Learning and Boltzmann Learning to decrease battery consumption of the network. The proposed technique is re-clustering the grid using neural network. In the present work clustering of grid is static, but in our clustering of grid is dynamic. It can be adjustable and changeable according to the situation. In this, node data which is send can be easily adjustable according to the situation and calculation made on the basis of battery

consumption. Here main concern is to avoid battery depletion. The cluster head is also elected according to the minimum battery consumption by applying election algorithm. There are three clusters in which three cluster heads are present. Cluster heads choose according to the maximum sending capacity and minimum battery consumption. The implemented in NS-2 and simulation results shows that novel technique increase network throughput and network lifetime.

5. FUTURE SCOPE

In the future work, we can make work on more enhancements in exiting technique to maximize the data packet with the use of less energy consumption and to increase the network lifetime. Compare the results of this proposed enhancement technique with the exiting best algorithms.

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