

Review paper on Energy Conservation Techniques of Wireless Sensor Networks

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Abstract- This paper provide the background of the wireless sensor network. The number of cheap wireless communication and computation has produced the new group of smart devices and by using thousands of these kind of devices in self-organizing networks has formed the new technology that is called wireless sensor networks (WSNs). In the following we basically described about the different energy conservation techniques of the wireless sensor networks.

Keywords- wireless sensor networks(WSNs), LEACH, PEGASIS, MRPS

1. INTRODUCTION

WSNs are self-configuring networks. In this no of devices connected with one another without any wires and communicate with each other. Wireless nodes may be mobile or stationary and are placed randomly according to the situation. The aim of the WSNs is to collect the information from the nodes and transmit it to the destination. Sensor nodes are very small in size and all nodes which are deployed have their own sensing region and they sense in that region and transmit it to the destination. One of the biggest disadvantage of large WSN is shortage of life span as it is very difficult to replace the sensor nodes which are deployed in the hostile areas. WSNs have lower communication speed as compared to wired networks. WSNs are easily affected by external sources like Bluetooth, far-distance etc. These networks are more costly and difficult to configure. This may be possible that within 15-20 years the whole world will come under wireless sensor networks that access via internet. In the coming days wireless networks used in many areas. The basic features of wireless sensor networks are capability to self organise, dynamic network topology, node failure and mobility of nodes, limited power, multi-hop routing, short-range broadcast communication and large scale of deployment. Mostly WSN is used for applications such as disaster monitoring and military surveillance.

Two main objectives are kept in mind while deploying the Network: coverage and connectivity. Both describe the robustness of having always a path between every pair of nodes. They can be easily controlled if the deployment is carried out via careful hand placement of

network nodes. This is what we call structured deployment approach. On the other hand, randomized deployment approach can be used for large scale applications where, for instance, nodes can be dropped from an aircraft. Another aspect to be mentioned is the heterogeneity or homogeneity of the deployment. Not always all the nodes other same performance due to the characteristics of the network topology. For example, in a single-hop star topology, the sink has a higher traffic load than the sensing ones. Therefore, the sink node must have better performance characteristics in order to cope with the requirements. Sensor nodes in a wireless sensor network have ability to configure their own network topology; localize, calibrate and synchronize themselves. Also they must be able to adapt themselves to unexpected situations and environmental conditions in order to have a robust network and keep the performance negotiated. After deployment of the nodes in wireless sensor network having topology changes due to changes in sensor nodes position, reach-ability, available energy and device failure or energy depletion.

Wireless Sensor Networks are basically **self organizing** and **self healing**.

Self organizing: In this basically new node join the networks, in this network nodes automatically join one another and start doing their work without any external interference that is nodes in this automatically join with each other and start communicating with each other.

Self healing: self healing basically means to repair, in this network nodes basically reconfigure the links. During any power down or failure in the nodes they find the alternative way to reach the destination. In this network alternate way is found rather than adding a node to the network.

2. LEACH (Low-Energy Adaptive Clustering Hierarchy):-

In this protocol the sensor nodes presented in the network contain some amount of energy. This protocol is the self centered for the networks. In this if the clusters are from and the cluster head chosen once remains cluster head for ever. It is same as the traditionally used clustering algorithm. The node that is selected as the

cluster head will die the network will stop working. The life span of network depend on the life span of cluster head.

Therefore LEACH has a high energy cluster which is random so that it can move or rotate among all sensor nodes to drain the battery of single sensor. Due to the advantages of LEACH such as reduced control messages, bandwidth re-usability, enhanced resource allocation, improved power control and less wastage of energy it is proved efficient for Autonomic Sensor Network which has mobile battery power nodes.

3. PEGASIS:-

In this protocol the communication link is formed in the form of the chain structure. The nodes will transfer data to other node in form of the chain and finally the data gathered from all the nodes is fused. These two are major factor on which the routing depends in case of this protocol. The working of this Protocol is same as the one member of the chain can act as the head of the chain for exchanging the data.

It is based on following assumptions:

- Sensor nodes have global knowledge of the network
- All the nodes are stationary
- Nodes have knowledge about the location of all other nodes.

It also face some problems as LEACH suffers. The main disadvantages of this is that it is not scalable so it cannot be used in case of wireless sensor networks due to the lack of knowledge regarding the nodes because of large number of nodes.

4. MODERATE RANDOM SEARCH PARTICLE SWARM OPTIMIZATION:-

MRPSO was first introduced by Hao Gao and Wenbo in the year 2011, In order to enhance the global search ability of the PSO but not slow down its convergence rate, we used a new PSO algorithm with an MRS strategy. In this algorithm we use only position update and no need of velocity updating

5. RELATED WORK

R. Rajeshwari, et al [1] in this paper author conveys that Sensor networks are combination of many sensor nodes. These sensor nodes sense the data from its surroundings and send that collected data to the base stations in the form of data packets. Because the lifetime of sensor node is based on the energy of battery, so it is mandatory to utilize the energy consumption by these nodes. To minimize the traffic and the data that is transmitted to the base station are important for minimizing the battery consumption of the network. . By

using clustering approach scalability, reduced energy consumption and better performance of network can be obtained. In Clustering approach whole network is divided into small clusters and each cluster has its cluster head which is selected from the clusters itself. Cluster heads generate the aggregate form of data sensed by sensors locally. This technique reduces the size of the data by generation compressed form of data and this compressed data is forward to the base station for a proper sink of the network.

Parul Saini et al [2] In this author defines that there are many routing techniques which are used to enhanced the lifetime and efficiency of the system. These protocols are helpful to increasing the fault tolerance and robustness in the system. In this the author use a technique EDEEC is the modification in traditional DDEEC technique. The results of EDEEC shows that the proposed technique much reliable to enhance the lifespan of the WSN as compared to traditional DEEC.

R. Renuga Devi et al [3] In this author conveys that the recent advancements in integrated circuit technology, Ad hoc network routing protocol, distributed signal processing and embedded systems have enabled the development of low cost, and low power, network enabled or multifunctional wireless sensor network environment. The major concern of all efficient WSN is optimal power consumption and maximum. Earlier WSN was used for monitoring and reporting events only but now it has variety of applications. As we know that each application has distinct requirement single Routing protocol is inefficient. In this author defines the energy efficient routing protocols into three main schemes as location based routing. The comparison shows the important design issues that need to be taken into consideration at the time when designing and evaluating network protocol is performed.

Georgios Smaragdakis Ibrahim et al [4] In this paper the author explains the effect of heterogeneity of hubs, as far as their strength, in remote sensor arranges that are progressively bunched. The author accept that the rate of the number of inhabitants in the sensor hubs are outfitted with extra vitality assets—this is a wellspring of heterogeneity which may come about because of the following setting or as the operation of the system develops. The likewise accept that the sensors are arbitrarily (consistently) conveyed and are not portable. The author demonstrates that the conduct of such sensor systems turns out to be exceptionally flimsy once the primary hub passes on, particularly in the nearness of hub heterogeneity. Established bunching conventions accept that all the nodes are outfitted with the same measure of vitality and thus, they cannot exploit the nearness of hub heterogeneity. The author propose SEP, a heterogeneous-mindful convention to delay the time interim before the passing of the main hub (we allude to as security period), which is essential for some applications where the input from the sensor system

must be dependable. SEP depends on weighted race probabilities of every hub to wind up cluster head as indicated by the remaining vitality in every hub. The author appears by recreation that SEP dependably drags out the dependability period contrasted with (and that the normal throughput is more prominent than) the one got utilizing current grouping conventions. The author closes by considering the affectability of our SEP convention to heterogeneity parameters catching vitality awkwardness in the system. The author found that SEP yields longer security locale for higher estimations of additional vitality brought by all the more capable hubs.

Sunita Rani, et al [5] In this author defines that the WSN i.e. wireless Sensor Network is a network consist of many small nodes. It is a kind of ad hoc network. In WSN each every node is a sensor node which senses the surrounding environment like temperature, light, sounds etc each sensor node works on the basis of energy allotted to them because energy is consumed by them in order to perform various operation like data transfer etc. For the purpose of data transmission each and every node which acts as source node consumes some amount of energy. Energy is the major factor on which the performance of the network depends. So the main focus for researchers is to improve the algorithm for less consumption of the energy so that the performance increases .The delay in data transferring can also be reduced by using various protocols. Example is PEGASIS. This protocol creates a chain structure along with a single cluster head and only this cluster head is used to transfer data to the sink node. The cluster head is only used by the member of that related chain. In this way the rounds are decreased and energy and time for data transferring is consumed to an extent. In this author introduces a new scheme which proves that selecting the next neighbour node provides much efficiency in the network. It is proved that PEGASIS provide much better results as compared to the traditional technique along with the energy efficiency and enhanced lifetime of the network.

6. CONCLUSION

In this we mainly discuss about the different energy conservation techniques of wireless sensor network.

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