

# Review on clustering base routing in Wireless Sensor Network

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**Abstract** - Due to recent advances in wireless communication technologies, there has been a rapid growth in wireless sensor networks research during the past few decades. Many novel architectures, protocols, algorithms, and applications have been proposed and implemented. The efficiency of these networks is highly dependent on routing protocols directly affecting the network life-time. Clustering is one of the most popular techniques preferred in routing operations. In this synopsis emphasis on cluster head energy and isolated nodes which optimize by probabilistic approach.

**Keywords** - probabilistic, optimization, cluster

## I. INTRODUCTION

WSN stands for wireless sensor networks, where the sensor nodes are used to communication with each other and transmit data to base station. It consists of small group like sensor nodes, base station etc. The working of sensor nodes is directly proportional to the source of battery. There are number of function in the WSN system. There are number of sensor nodes in the WSN system which is used to float the data from one place to another. It is a group of thousands of sensor devices which used to communicate with wireless networks by utilizing limited energy. WSN is a technology which has too much application like to control environment, in medical line, military application etc. [1]. Clustering relay based indicators that the site is a good choice for scalability to be able to a large number of hundreds of possible nodes. A group comprises a group with at least one group of customers (CH). CHS is managing your node in your group and are also sometimes responsible for sending the full facts in a remote database (sic). Regular re-clustering of course, can serve CHS nodes with high residual energy. While designing a sensor network it is very important to take care about its decisive, efficiency, significance and effect on environment etc. [2] WSN are the dense networks which consist of low-power, sensors, nodes etc. [1]

As we discuss above working and efficiency of WSN or sensor depends upon the source of energy. For high speed and accuracy in the system it needed more energy. There are some processes where there is a loss of energy in WSN. The main work of this paper is to reduce the wastage of the energy on the WSN a proper utilization of system and to enhance the life duration of WSN system. In some cases like under water

WSN system, batteries are not replaceable it becomes very difficult to work in that situation where life of system is limited. Therefore the main goal of this paper is to discuss various techniques and methods which are helpful in the working with limited energy in precise manner or to enhance the life of system.

The communication process within the wireless network is done through gateway which gives a wireless connectivity and dispersed nodes [2]. Here data is transmitted from one node to other and makes a complete communication. As there are many application of WSN in the global world but the main concept in this paper is about the utilization of networks in efficient manner. As these networks are situated in all around like , into the earth, soil, air etc. and have precise working but they utilizes excess amount of energy . As we discuss above the Sensor nodes work on battery and have limited durability. It is the most common problem in the WSN and in other hand applications of WSN is increasing day to day inventions which require high speed for communication purpose and more battery usage. Here this work also represents the efficient utilization of WSN by various means of technique given by different authors. This study is discussed in next section of this paper.

Further in this paper there is a discussion about the related work to increase the efficiency of the WSN system, in section III there is a discussion about the proposed methodology and in section IV there is a discussion about results and at last there is summary of the whole work in section V.

## II. RELATED WORK

**Say, et al. [4]:** In this paper, a work is presented on the basis of the multi-hop approach. Here a plausible algorithm is proposed which employs the COFS to engage effective data collection. Both proposed scheme and proposed algorithm show their significant and effectiveness to obtain consumption of low energy and it also extends the life duration of WSN sensors. Here author also introduces energy consumption model. To check the suitability or working of the model simulation is done for the proposed algorithm.

**Arai, Masayuki et al. [5]:** In this paper, On the basis of multi-path routing scheme a multi-path routing there is an discussion about the tabu-list for WSN. This scheme, several

duplicate of the events is delivered to all nodes by different paths without using the additional communication path information. In this paper author also discussed the effects of Wormhole attacks and location-aware Wormhole attacks. The proposed method also explained the role of this protocol in Wormhole attack avoidance.

**Dema et al. [6]:** This paper deals with the study of security concern on WSN. The author proposed an algorithm which provides the effective security to the wireless sensor network by identifying the nodes using the node ID. It also provides the Load Balancing feature for monitoring the nodes. In this algorithm, nodes can be rerouted to avoid the attacked nodes. The simulation results show that it works very efficiently on the live attack.

**Abduvaliyev, Abror, et al. [7]** survey of the work done on IDS in wireless sensor network. In this paper author also discussed the various IDS approaches that are used in the detection of anomaly and misuse detection. A brief description of WSN attacks is also available in the given paper. The major concern of the author is to determine the advancements in the field of WSN. It provides the new topics of the research in this field.

**Raje et al. [8]** proposed the fuzzy based approach for providing the security to the wireless sensor network. This approach enhanced the routing, security and reliability in the WSNs. In this approach, firstly select the sensor node on the basis of the energy of the node. This node is called as cluster head, which performs the operations like data aggregation. This approach works on the following parameters like packet transmission rate, packet received rate, and a packet drop.

**Ma, Rui, et al. [9]** Proposed two types of defense strategies that are based on the monitoring the behavior of neighboring node and location information of the neighboring node. In this paper, the concept of packet encapsulation is used to provide the most effective method for wormhole attack. Running a state is simulated under the normal condition and wormhole condition by using OMNET++ simulation environment. In wormhole attack, the running state applies to defense method which is based on location information and monitoring the neighbor node. The analysis results of the simulation show that it works effectively on the attacks in WSN.

**Shafiei, Hosein, et al. [10]** this proposed two approaches that detect and reduce the attacks in wireless sensor networks. This distributed approach estimates the energy holes in the wireless sensor network. It detects the Sink Hole attacks based on hazard model. The simulation results of this approach provide the effectiveness and correctness.

**Frey et al. [11]** explained the design issues in the routing protocols of wireless sensor network. Author presents a routing technique based on geographic routing. Author surveyed on the different techniques of routing. In this author presents the beaconless routing algorithm. Author also discussed the effect of routing on the physical layer

**Wang et al. [12]:** In this paper, author used to introduce an EECA which stands for energy efficient and collision aware algorithm for WSN. With the aid of hub position data, the EECA calculation endeavors to discover two crash free courses utilizing compelled and control balanced flooding and afterward transmits the information with less power required through a power control segment of the convention. Our preparatory recreation comes about demonstrating that EECA calculation brings about great general execution, sparing vitality and exchanging information effectively

**Mathapati, et al. [13]:** In this paper, for WSNs EERDAT is proposed which stands for energy efficient reliable data aggregation technique. Initially to control nodes in the cluster coordinator nodes is selected and form clusters. On the basis of energy level and its distance cluster heads are selected for every individual cluster by coordinator nodes. The collection of cluster heads is combined with the packets given by sensor nodes and then transferred to coordinator node. Then there is an evaluation of loss ratio as used to compare with the loss ratio of a threshold value. The result indicates the better performance as compare to other methods

**Tian, et al. [14]:** In the given paper, as efficient chain-cluster routing (ECR) is proposed for WSN. There is also an introduction of thought of protocol architecture. By using hybrid way this protocol maintains the networks and also takes the benefits of central control and distributed algorithm for the formation of topology containing two-hierarchical chain structure. The simulated result shows the merits of ECR by comparing with LEACH and PEGASIS which are termed.

**Bachir, et al. [15]:** In this paper, a study on state-of-the-art is given where there is thoroughly present the prime focus of WSN-MAC protocol, the guideline for its design, demerits of existing solutions, etc. on the basis of the previous study we concentrate on the classification of MAC protocols according to the used technique by using thematic taxonomy. Thematic taxonomy is a method where the classification of the protocol is done on the basis of their problem. By using statistical properties of generating traffic an appropriate solution for a particular situation is selected as a key element.

## Review table:

Authors Name	Year	Technology used	Description
Say, et al.	2014	Multi-hop approach and plausible algorithm.	Both proposed scheme and proposed algorithm show their significant and effectiveness to obtain consumption of low energy and it also extends the life duration of WSN sensors.
Arai, Masayuki et al	2014	Multi-path routing	This scheme, several duplicate of the events is delivered to all nodes by different paths without using the additional communication path information
Dema et al.	2013	Load balancing features	The author proposed an algorithm which provides the effective security to the wireless sensor network by identifying the nodes using the node ID. It also provides the Load Balancing feature for monitoring the nodes.
Raje et al.	2017		In this paper author also discussed the various IDS approaches that are used in the detection of anomaly and misuse detection. A brief description of WSN attacks is also available in the given paper.
Ma, Rui, et al.	2013	Fuzzy based approach	This approach enhanced the routing, security and reliability in the WSNs. In this approach, firstly select the sensor node on the basis of the energy of the node. This node is called as cluster head, which performs the operations like data aggregation
Shafiei, Hosein, et al.	2014	OMNET++	In this paper, the concept of packet encapsulation is used to provide the most effective method for wormhole attack.
Frey et al.	2017	Hazard model	This distributed approach estimates the energy holes in the wireless sensor network. It detects the Sink Hole attacks based on hazard model.
Wang et al.	2009	Routing technique based on geographic routing.	Author surveyed on the different techniques of routing. In this author presents the beaconless routing algorithm. Author also discussed the effect of routing on the physical layer
Mathapati, et al.	2006	EECA is used	With the aid of hub position data, the EECA calculation endeavors to discover two crash free courses utilizing compelled and control balanced flooding and afterward transmits the information with less power required through a power control segment of the convention.

## III. CONCLUSION AND FUTURE SCOPE

Wireless Sensor Network used to monitor the physical and environmental conditions such as temperature, sound, pressure etc and passing the data through the network to the main location. A sensor network consists of multiple detection stations called sensor nodes, each of which is small, lightweight and portable. Each wireless network consists of hundreds of nodes which integrate with existing wired measurement and control system. Node consume more energy for transmission purpose, with this network lifetime of WSN will decreased. So the nodes are dies quickly in the network

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