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Routing for Sink Nodes with Obstacles in Cluster-Based WSN

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***Abstract*: In wireless sensor networks (WSNs), the assistance of exploiting the sink mobility to extend network lifetime have been well identified. This paper delivers an energy-efficient routing system stationed on the cluster-based approach considering obstacles for the mobile sink in WSNs. Based on cluster method, the node is elected as a cluster head which collects data from their respective cluster members and forwards the data to the mobile sink. In this paper, the mobile sink initiates the data-gather route periodically from the beginning site, then directly gets data from these cluster heads in a single-hop range, and lastly backs to the initial site. However, having obstacles in WSN's the complexity of the scheduling problem increases the traditional algorithms are difficult to resolve.**

I. INTRODUCTION

Wireless sensor networks (WSNs) have a extensive set of collections. These include sensing data collected from various environments from the sensor devices. Respective sensors forward its data to sink (Base Station), and later sends to the end user. For the Better Data Gathering and scalability in large sensor networks, Clustering is considered to be effective approach. In Wireless Sensor Networks, Clustering is an adequate way of lending scalability and data aggregation. Due to the Presence of many Obstacles in the dense network, WSN's have less Performance. Here we employed RCER algorithm, Based on Geographic locations sensor nodes are clustered. Algorithm identifies an obstacles using message communication between neighboring sensors and it sends data with the help of RCER rule.

Wireless Technologies re-frames the world of Communications. By first, with Radio transceiver in wireless telegraphy. There by term wireless is evolved in order to describe Wireless broadband (Internet) and Cellular networks. Even though, channel having finite spectrum along with other constraints, affords mobile communications only. Large number of sensor nodes is deployed using Wireless Ad-hoc Networking. Mobile ad-hoc networks (MANET) subsist with wireless devices along with mobile hosts. Due to its broadcasting nature of wireless communication and Omni directional antennae, all hosts receives mobile host transmission within its transmission range. If hosts are not within range, in between mobile nodes can forward their message, thus connectivity builds effectively in adhoc networks for all mobile hosts in deployed area.

II. BACKGROUND

In the paper titled "Energy consumption monitoring for sensor nodes in snap" the authors communicates that as vitality is one of most urgent viewpoints for ordering calculations' execution, it's vital to get an apparatus to compute the rest of the vitality utilization. There wasn't any fantastic answer for check vitality utilization of each individual sensor hub in remote sensor organize. In this paper, the creators prescribes another continuous vitality observing game plan as a practical nuts and bolts for WSN test bed (sensor arrange right hand stage, SNAP). The creators describes an observing outline which has taking after points of interest: ongoing exact vitality estimation, the ability to adapt to vast scale WSN, checked hubs with free reactions, exceedingly versatile to different sorts of sensor hubs and backings facilitate examination on hubs as for vitality productivity.

In the paper titled "Wireless Sensor Network Platform for Intrinsic Optical Fiber pH Sensors" the authors investigates the capability of making a half breed WSN through the development of a nonexclusive remote sensor arrange stage, which gifts for the able coordination of a no. of novel optical fiber (wired) sensors. The intention is to support the capability of a sensor display. A fundamental design comprises of a LED light source, a photodiode, a channel, and an enhancing circuit. In this way, singular bit can proof and process the signs set up from the optical fiber sensors and send those information caught remotely to a base station. To affirm both the mixture discernment and the adequacy of a non specific stage, the model is confirmed utilizing a characteristic pH optical fiber sensor. At the point when the sensor is directed to a scope of arrangements, the information created from the framework are procured at the base station. The viable outcomes accomplished affirm the execution of the plan, and its capacity to give constant optical fiber sensor information observing, handling, and transmission.

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III. ALGORITHMS

A. *LEACH Algorithm*

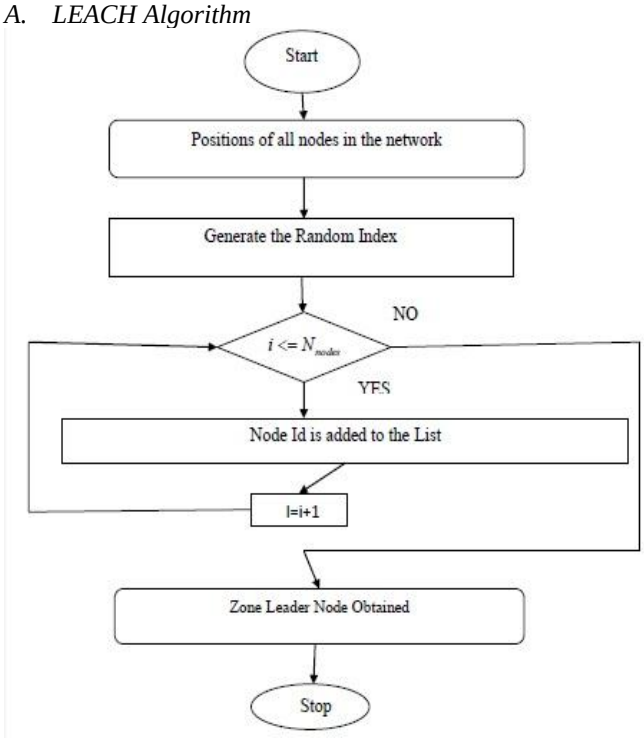

Figure 1: LEACH Algorithm

LEACH is renowned algorithm for Wireless Sensor Networks since it includes groups and cluster heads for data transmission.Cluster heads are elected randomly. In this major concern in Data transmission power consumption, thus it is required to have powerefficient protocols. In order to curtail the total power consumption within the network.LEACH handles cluster heads in rounds for long distance transmission. Thus we require more efficient algorithm other than LEACH which has less power consumption and better efficiency in energy.

Disadvantages of LEACH:

1. The selection of cluster head in LEACH, which elects the head randomly based on lowest battery level because of huge probability that a node has and packets are seized from data transmission.
2. In LEACH Cluster head maintains local topology i.e., which nodes belongs to which cluster because of this to and fro communication are possible within the nodes from source to base station and vice versa. This results in exponential increase of end to end delay and also curtails energy consumption.
3. Algorithm doesn't useful in the presence of obstacles during data packet transmission, because of which data packets can move to and fro and get blocked within the network.

B. *GRID Algorithm*

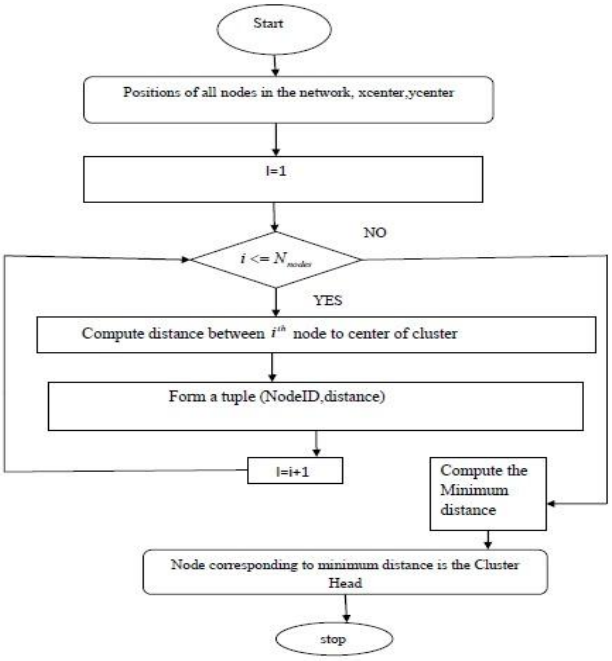

Figure 2: GRID Algorithm

In the current scenario, the Obstacle aware approach prefers the cluster head based on the nodes residual energy. Initially cluster head elected based on near on the cluster center. Then from next, cluster head is elected based on nodes residual energy.Which has highest energy when compare to other nodes in the network. With this current scenario, 2 routing algorithms were used. First one is based on cluster head routing algorithm and next is based on grid. Cluster head routing approach finds the capable path which involves normal nodes along with cluster heads. Grid routing approach is based on knowledge of obstacle awareness i.e several paths are found with not involving obstacles in the path.

IV. RESULTS

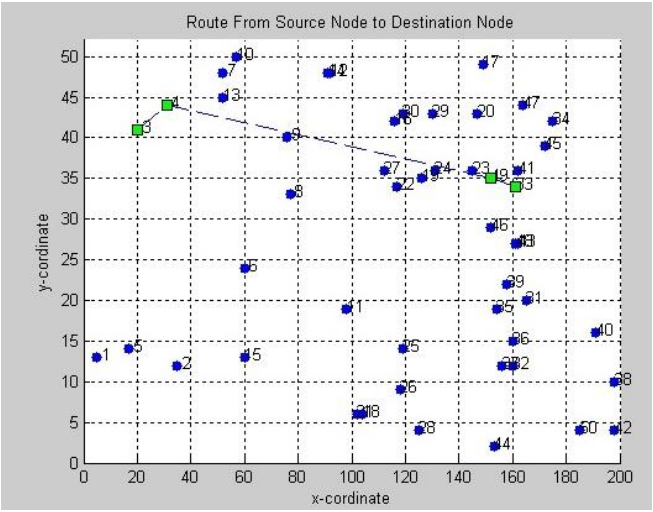

Figure 3: Route from source to destination nodes in GRID

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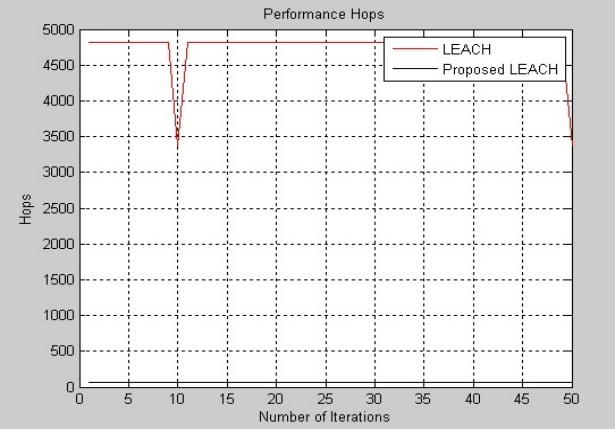

Figure 4: Performance Hops

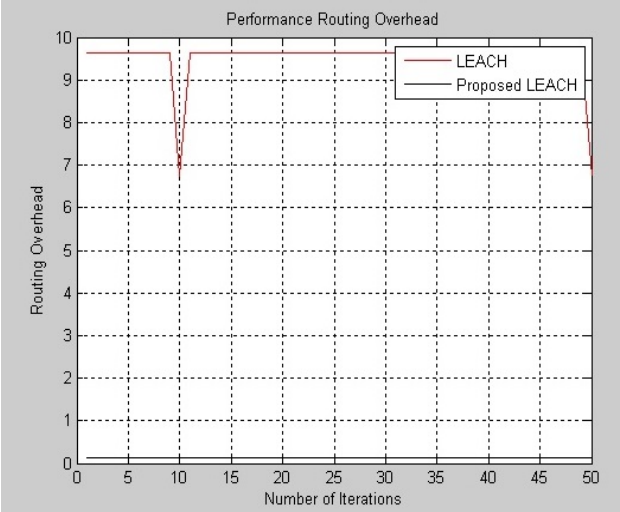

Figure 5: Performance Routing Overhead

Figure 3 shows route from source to destination node in GRID algorithm.

Figure 4, 5 and 6 shows the comparison of LEACH and GRID algorithm in terms of number of hops, routing overhead and throughput.

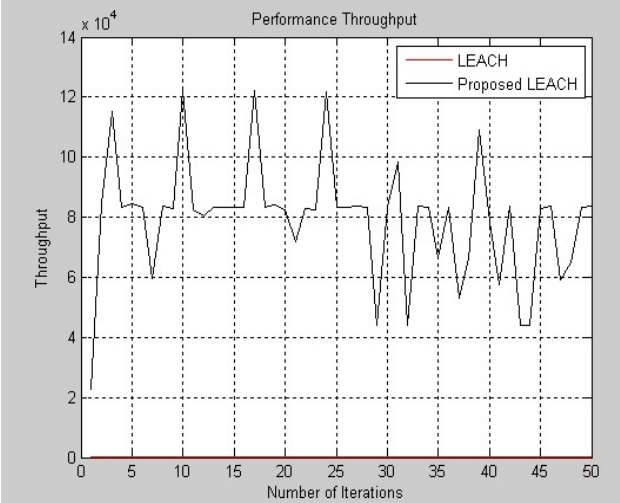

Figure 6: Performance Throughput

V. CONCLUSION

The network is divided globally into Hierarchical Network and Non Hierarchical Network. LEACH algorithm belongs to a category of hierarchical network. LEACH discovers the route between sources nodes to destination node with base station being involved in the communication with back and forth propagation for the case of inter cluster communication. LEACH algorithm is future simulated to measure the parameters which includes Average Transmission Delay, No. of Hops, Consumption of Energy, No. of Alive Nodes, No. of Dead Nodes, Lifetime Ratio and Routing Overhead. In the Obstacle Aware Approach elects the cluster head stationed on the residual energy of the node. Initially cluster head is selected based on the closeness on the center of the cluster.

VI. REFERENCES

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