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A Study on the Security Aspects in Networking

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ABSTRACT: *Wireless Sensor Network (WSN) comprises of countless minimal effort sensors which speak with one another through wireless channel. WSN has been proposed for a wide assortment of utilizations, for example, target following, security, condition checking. A significant utilization of WSN is to quantify nature boundaries and send the sensor readings to far off worker. Since neighboring sensors may distinguish the basic wonder, there is high excess in their crude data and it is wasteful to send all crude data to far off worker.*
A solitary level network can make the door over-burden with the expansion in sensors thickness. Such over-burden may cause inactivity in correspondence and insufficient following of occasions. Also, the single-level engineering isn't versatile for a bigger arrangement of sensors covering a more extensive zone of intrigue in light of the fact that the sensors are normally not able to do long stretch correspondence.
KEYWORDS: *Clustering, Network, Node, Data, Wireless, Sensor, Sensors, Networks*

I. INTRODUCTION

Clustering has been broadly utilized in wireless sensor networks (WSNs) to build adaptability, improve vitality proficiency and give QoS ensures. With clustering, sensor nodes are composed into bunches and a group head (CH) node is chosen for each bunch as indicated by specific standards, while different nodes go about as individuals in the bunches. In group based data gathering, data gathered by bunch individuals are first sent to CHs, which thusly convey the data to the data sink either by direct correspondence or through transfers on halfway CHs. While clustering is at first acquainted with accomplish vitality effectiveness, it can likewise help keep up low bundle idleness in delay-touchy data gathering. This is on the grounds that that bundles from various individuals can be joined as amassed parcels at CHs to decrease the transmission overhead of bundle headers and control bundles (e.g., ACK parcels), prompting abbreviated transmission delay. Moreover, clustering simplifies the steering from the source node to the sink and shorter directing ways diminish network traffic also.

Sensor nodes gather data from their condition and send it to the Base Station. Heterogeneous sensor network contains high vitality sensor nodes just as low vitality nodes. The group head totals and sends the data to the Base Station.

Various leveled clustering is especially helpful for applications that expect adaptability to hundreds or thousands of nodes. Versatility in this setting suggests the requirement for load adjusting and proficient asset usage. All nodes in a network can be composed in various leveled structures called groups. Each bunch comprises of a group head and a few part nodes. The part nodes gather data and send it to their group heads.

The vitality utilization of bunch heads is higher than that for part nodes. Clustering calculations are required which can proficiently use the vitality of nodes so life of network can be expanded. Here we are proposing Fluffy Rationale based clustering for homogenous sensor networks.

II. RELATED WORK

Ajay Jangra et al. [1] present a novel security S-Filter component which is the augmentation of Drain directing convention utilized for identifying the Sybil assault. The system is designed to start the Sybil assault whose discovery is handed-off on RSSI (a pointer of sign quality) when the quantity of bunch heads in WSN is over the limit. The security system is peddled by the wellbeing of the stage and vitality utilization through a progression of tests.

Deng Zhejiang et al. [2] performed; because of the restriction of intensity and memory size for WSN, the steering convention for wireless sensor networks must keep up little directing data and diminish the force utilization however much as could be expected. Drain convention and PEGASIS convention are investigated initially in this paper. Use for reference of the thoughts utilized in both of the two conventions of decreasing force dissemination, a three-layered directing convention for WSN dependent on LEACH(TL-Drain) is given.

Fan Xiangning et al. [3] considers Filter convention, and advances vitality Drain and multihop-Drain conventions. Vitality Drain Convention improves the decision technique for the group head, makes a few nodes which have more leftover vitality as bunch heads in the following round. Multihop-Drain Convention improves

correspondence mode structure single jump to multihop between group head and sink. Reenactment results show that Vitality Filter and Multihop-Drain Conventions have preferable execution over Filter Conventions.

Fuzhe Zhao, You Xu, Ru Li, Wei Zhang et al. [4] propose another technique for picking group heads with diminishes pointless utilization of vitality spent on figuring of every node during each round. So as to cause the vitality to disseminate all the more even in the network, the thought of the dynamic difference in sensor nodes vitality will be presented during the choice of CHs.

Fuzhe Zhao et al. [5] proposes another technique for picking bunch heads which diminishes superfluous utilization of vitality spent on registering of every node all through each round. Since the customary determination equation fail to the difference in nodes' vitality will make the nodes going about as group heads (CHs) too often kick the bucket early attributable to expend more vitality.

Haosong Gou et al. [6] this paper proposes an improved Drain (Filter C) calculation called segment based Filter (pLEACH), which right off the bat parcels the network into ideal number of areas, and afterward chooses the node with the most noteworthy vitality as the head for every part, utilizing the brought together estimations. The thought behind Filter is to shape bunches of the sensor nodes relying upon the got signal quality and utilize nearby group heads as switches to course data to the base station and the relating bunches.

Heewook Shin et al. [7] proposed another vitality effective clustering plan. He expressed that in Drain, in any case, additional vitality and time are expended to change bunches at the arrangement period of each round. This symptom is terrible as the quantity of bunches increments. This paper present a novel vitality effective clustering plan to eliminate group reproducing measure required at each round after the first round, which is called Beds (Clustering with One Time Arrangement). The proposed Bunks permit that the function of group head is pivoted among individuals in a bunch without group transforming measure. Along these lines altogether spares the vitality in light of the fact that the bunch changing cycle isn't required, bringing about expanded network life expectancy.

Hu Bouncing et al. [8] played out a wireless sensor network comprises of hundreds or thousands of little vitality restricted sensors that are thickly conveyed in an enormous topographical locale. It has been exhibited that Low-Vitality Versatile Clustering Chain of command is a vitality proficient directing calculation for Wireless Sensor Networks.

Jun YUE, Weiming ZHANG, Weidong XIAO, Daquan TANG, Jiuyang TANG et al. [9] presents a novel inconsistent group based data total convention is proposed. It separates the network into certain matrices with inconsistent sizes, and executes bunch head revolution in every framework individually. It can adjust vitality dissemination by setting legitimate sizes of networks to change the quantity of nodes that take an interest in bunch head pivot in various matrices.

Y. Yang et al. [10] played out a work, In view of the examination on the deformity in Drain including the vacillation of the quantity of bunch heads and the obliviousness of the node's lingering vitality, this paper presents a novel convention called Filter B (Drain Adjusted). At each round, after first determination of group head as indicated by Filter convention, a subsequent choice is acquainted with adjust the quantity of radiance head in light of nodes remaining vitality. Accordingly the quantity of bunch head is consistent and close to ideal per round.

Muhamnmad Omer Farooq et al. [11] presents a multi-bounce steering with low vitality versatile clustering chain of importance protocol.MR-Drain follows the key guideline of multi-jump directing from group heads to a Base station to monitor vitality, in contrast to the filter convention. In MR-drain they parcel the network into various layers of groups. Where Group heads in each layer teams up with the adjoining layers to Send sensor's data to the base station. Common nodes Join bunch heads dependent on the got signal quality pointer (RSSI).

In year 2010, Muhammad Omer Farooq et al [12] played out a work.In this paper, we present a Multi-bounce Directing with Low Vitality Versatile Clustering Pecking order (MR-Drain) convention. So as to delay the lifetime of Wireless Sensor Network, MR-Filter segments the network into various layers of groups. Bunch heads in each layer works together with the contiguous layers to communicate sensors data to the base station. Common sensor nodes join group heads dependent on the Got Signal Quality Marker (RSSI).

Nandini. S. Patil, Prof. P. R. Patil et al. [13] introduced a data total system on wireless sensor networks is introduced. The system fills in as a middleware for collecting data estimated by various nodes inside a network. They analyze the presentation of TAG(Tiny Collection) regarding vitality effectiveness in correlation with and without data conglomeration in wireless sensor networks and to survey the reasonableness of the convention in a domain where assets are restricted.

Wei Bo Hu Han et al. [14] played out a work; Ordinary Drain incorporates appropriated bunch arrangement, neighborhood handling to lessen worldwide correspondence, and randomized turn of the group heads. The new convention utilizes multi-jump steering rather than 2-bounce directing in Filter, and related calculation is proposed. Reproduction results show that improved convention is more vitality productive that ordinary Drain.

PROPOSED PROTOCOL

Proposed function implements Fuzzy Logic based clustering which in enhanced form of weight based clustering in wireless sensor networks. Weight based clustering protocolhas the disadvantage that it elects unnecessarily extra cluster head. Sometimes Nodes with high residual energy were not given a chance to become cluster head.

This disadvantage is overcome by Fuzzy Logic based clustering algorithm. All nodes with similar energy are given same chances to become cluster head.

Also a node with high residual energy even if it is lying in captivity of another cluster head will be elected as a cluster head. The proposed clustering technique is an enhancement our Weight based clustering.The overarching goal of our approach is to prolong network lifetime. For this reason, cluster head selection is primarily based on the residual energy of each node. Measuring this residual energy is not necessary, since the energy consumed per bit for sensing, processing, and communication is typically known, and hence residual energy can be estimated. Fuzzy logic is used for finding cluster head which always chooses optimal number of cluster heads. The use of fuzzy logic is appropriate, whenever it is not possible to employ a mathematical model for the system. Additionally, fuzzy can reduce the complexity of the model; computational effort and memory's receive context information from nodes as input and converts into fuzzy linguistic variable input.

First order radio energy is used for performing radio analysis. It takes the following form

Einit=0.5 in joules

Eelec=50*0.000000001

EMP=0.0013*0.000000000001

Eda=5*0.000000001

Where Einit is initial energy, Eelec is electrical energy, EMP is amplification energy, Eda is data aggregation energy.

The Pseudo code

The Pseudo code of Proposed Model is as Follows:

Step1: Start

Step 2: Create a Network

Step 3: Create Clusters from network using:

a. A CH is selected from the SNs by considering a multiple metrics i.e. residual energy and a distance from non-CH to CH using the concept of Fuzzy logic and Cluster is created.

b. Based on last step, Non-CHs select the best CH based on distance matrices to become its member.

Step 4: Stop

PERFORMANCE EVALUATION

This part presents the simulation and results of the presented model.

Simulation Scenario

Initially there is a network in which nodes are distributed randomly as shown in figure 1.

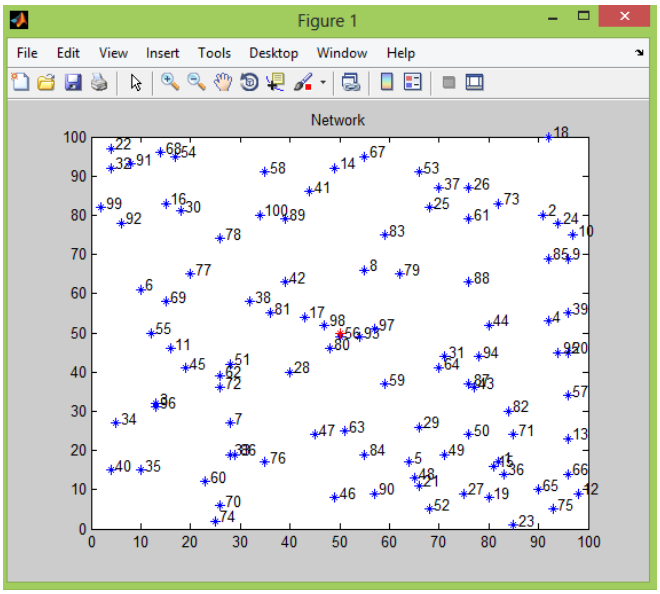

Figure 1: Network creation using 100 Nodes.

In figure 2 new scheme is implemented in which cluster head are elected based on the given logic of presented model. These cluster head are shown by star shape in blue color (*).Red stars are dead nodes.

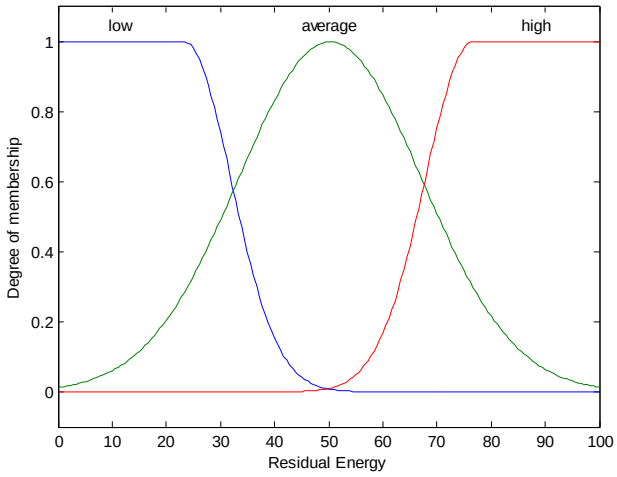

Figure 2: Cluster Formation

Each Normal node will elect its cluster head based on Probability which can be calculated Fuzzy Logic System using the two input variables "distance between the node & cluster head" and "Residual Energy".
Figure 3 and figure 4 show both inputs and their corresponding graphical representation in fuzzy system.

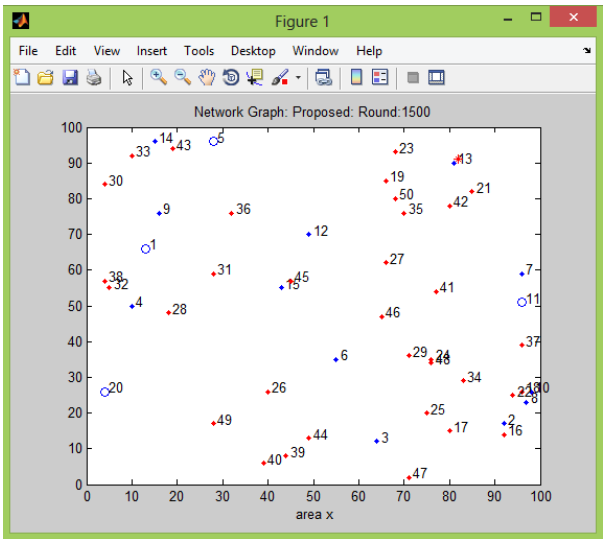

Figure 3: Degree of membership for Residual energy as first input for fuzzy system.

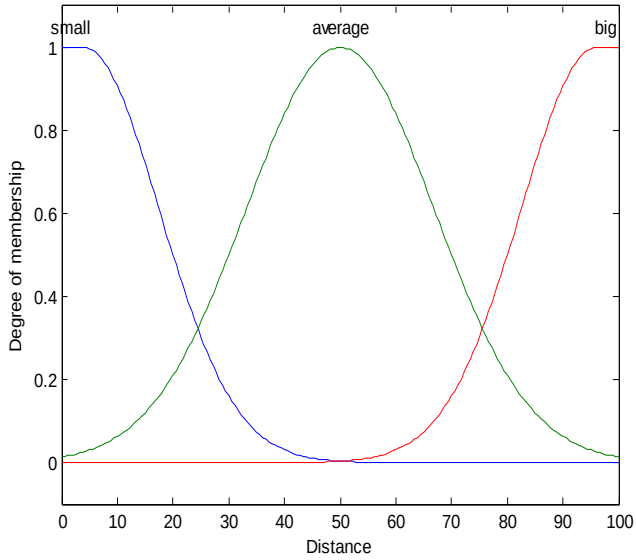

Figure 4: Degree of membership for Distance as second input for fuzzy system.

Correlation between Residual energy and Distance for Fuzzy system is shown in figure5.

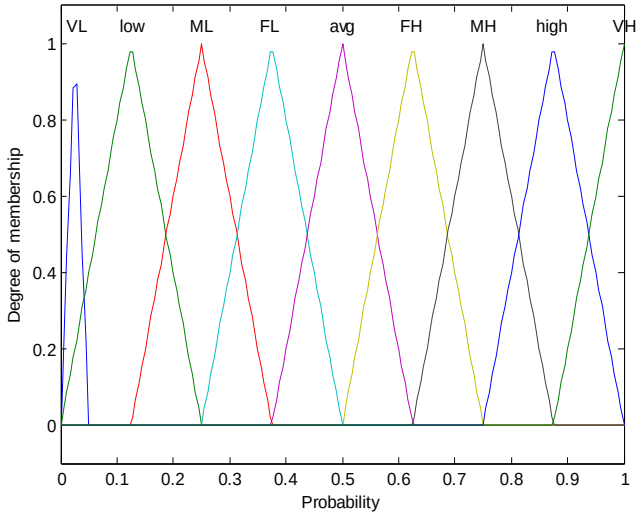

Figure 5: Correlation between Residual energy and Distance for Fuzzy system

Finally figure 6 shows the surface graph for probability calculation for cluster formation.

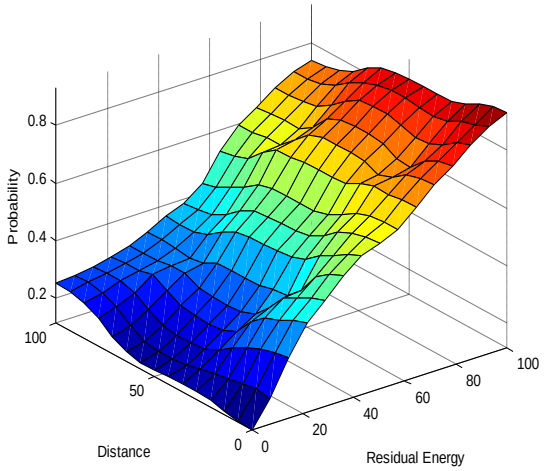

Figure 6: Surface Graph for Probability Calculation for cluster formation.

Using this Probability Calculation fuzzy logic, each normal node calculates the probability for each cluster head. The node which has the highest probability with respect to any cluster head will be the member of that cluster for cluster head in that round. In this way Cluster formation is done in the presented work.

Performance Evaluation

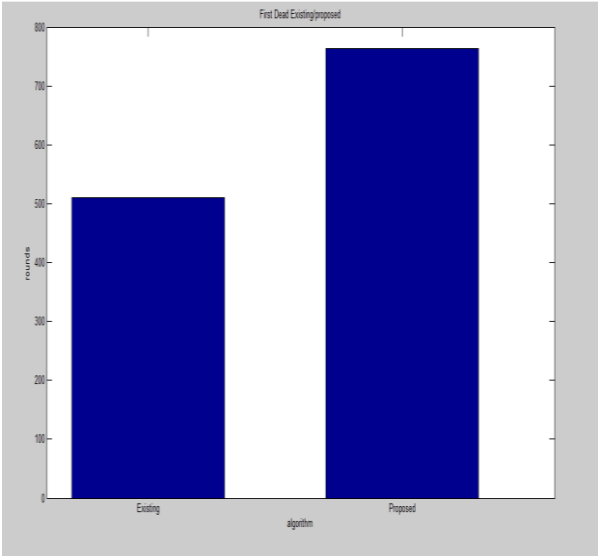

Figure 7: Comparison of existing and proposed system in terms of first dead.

The figure 7 graph shows that first dead node in our proposed algorithm happens after 700 rounds in spite of existing weight based algorithm which is having its first dead very close to 500 round. Hence our algorithm is Energy efficient than existing algorithm.

Figure8 gives the graph which compares the performance of existing and proposed system in terms of number of dead nodes with total number of clustering rounds. Green line represents the proposed system and blue line represents the existing system. Graph shows that proposed system shows improved performance over existing system in 1000 rounds.

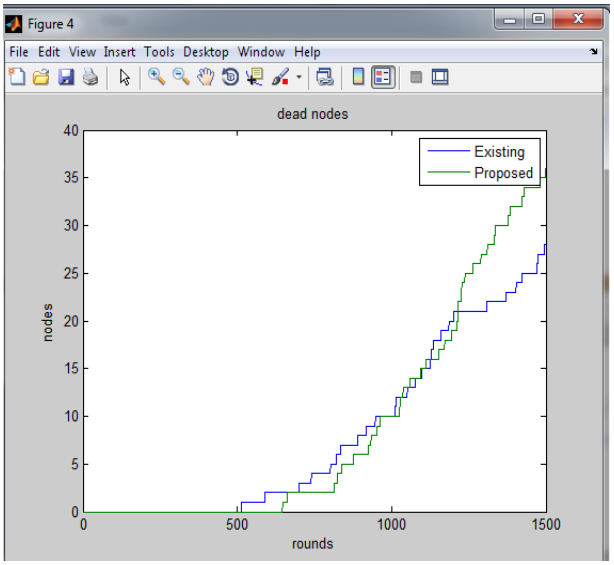

Figure 8: Performance Evaluation of existing and proposed system in terms of no. of dead nodes& no. of rounds.

The graph 9 gives a comaprison of the performance of existing and proposed system in terms of number of dead residual energy with total number of clustering rounds. Green line represents the proposed system and blue line represents the existing system. Graph shows that proposed system have almost same residual energy up to initial 500 rounds as existing system is having.

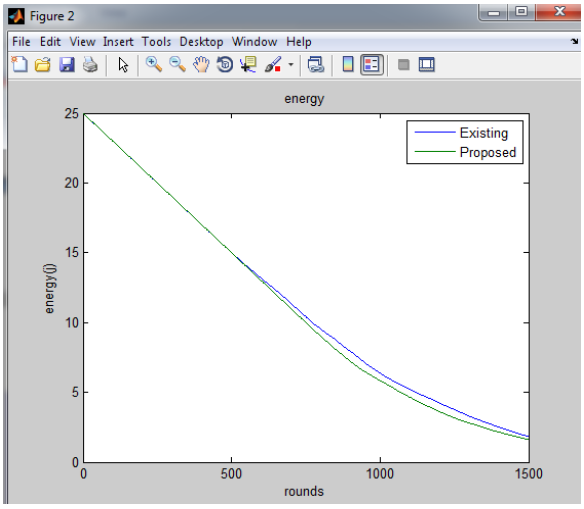

Fig: 9 comaprison of the performance of existing and proposed system in terms of number of dead residual energy with total number of clustering rounds

III. CONCLUSION

We have presented an efficient technique for clustering of sensor nodein the homogenous WSNs. In the existing LEACH protocol the clusters are formed using the distance calculation from the node to cluster head. But for a network to be good designed there should be a better cluster formation.

For a better cluster formation the concept of fuzzy logic is used in which non-CHs select the best CH by considering a multiple metrics, i.e. residual energy and a distance from non-CH to CH. Then, non-CHs compute a probability value to each CH candidate. The non-CH chooses the CH with a higher probability value and sends a join message to CH.

The use of fuzzy logic is suitable, whenever it is not possible to use a mathematical model for the system. Additionally, fuzzy can reduce the complexity of the model, computational effort and memory. Energy consumption is affected by message communication between nodes, so our technique is efficient than traditional LEACH protocol.

Also weight based clustering protocol has the disadvantage that it elects unnecessarily extra cluster head. Sometimes Nodes with high residual energy were not given a chance to became cluster head. This disadvantage is overcome by Fuzzy Logic based clustering algorithm. All nodes with similar energy are given same chances to become cluster head. Also a node with high residual energy even if it is lying in captivity of another cluster head will be elected as a cluster head.

FUTURE SCOPE

This algorithm is implemented for homogenous wireless sensor networks. Algorithm can be further implemented for heterogeneous networks.

REFERENCES

[1]. Ajay Jangra, Swati, Priyanka, "Securing LEACH Protocol from Sybil Attack using Jakes Channel Scheme (JCS).
[2]. Deng Zhixiang, "Three-layered Routing Protocol for WSN based on LEACH Algorithm," IEEE, 2008.
[3]. Fan Xiangning, "Improvement on LEACH Protocol on Wireless Sensor Network," mt. Conference on Sensor Technologies and Applications, 7 July, 2007.
[4]. Fuzhe Zhao, You Xu, Ru Li, Wei Zhang, "Improved Leach Communication Protocol for WSN," Int. Conference on Control Engineering and Communication Technology,2012.
[5]. Fuzhe Zhao, You Xu, Ru Li, Wei Zhang, *"Improved Leach Communication Protocol for WSN",* 2012 International Conference on Control Engineering and Communication Technology IEEE.
[6]. Haosong Gou, "An Energy Balancing LEACH Algorithm for Wireless Sensor Networks," 7th Conference on Information Technology, 3 October, 2010.
[7]. Heewook Shin, SangmanMoh, and Ilyong Chung, "*Energy-Efficient Clustering with One Time Setup for Wireless Sensor Networks"* IEEE 2012.
[8]. Hu Junping, "A Time-based Cluster-Head Selection Algorithm for LEACH", IEEE, 1 August, 2008.
[9]. Jun YUE, Weiming ZHANG, Weidong XIAO, Daquan TANG, Jiuyang TANG, "A Novel Unequal Cluster-based Data Aggregation Protocol for Wireless Sensor Network," PRZEGLĄD ELEKTROTECHNICZNY, ISSN 0033-2097, R. 89 NR 1b/2013.
[10]. M. Ma and Y. Yang, *"Data gathering in wireless sensor networks with mobile collectors,"*in Proceedings of the 22nd IEEE International Parallel and Distributed Processing Symposium (IPDPS '08), April 2008.
[11]. Muhamnmad Omer Farooq, Abdul BasitDogar, GhalibAsadullah Shah, *"MR-LEACH: Multi-hop Routing with Low Energy Adaptive Clustering Hierarchy"*2010 Fourth International Conference on Sensor Technologies and Applications IEEE.
[12]. Muhammad Omer Farooq, "MR-LEACH: Multi-hop Routing with Low Energy Adaptive Clustering Hierarchy," Fourth Int. Conference on Sensor Technologies and applications, 2 October, 2010.

[13]. Nandini. S. Patil, Prof. P. R. Patil, "Data Aggregation in Wireless Sensor Network," IEEE International Conference on Computational Intelligence and Computing Research,2010.
[14]. W.B.Heinzelman, A.P.Chanrakasan and H.Balakrishnan, "AnApplication-Specific Protocol Architecture for Wireless Microsensor Networks," Transactions on Wireless Communications, Vol. 1, No. 4, pp. 660-670, October, 2002.
[15]. W.R. Heizelman, A.Chandrakasan and H.Balakrishnan, "Energy-Efficient Communication Protocol for Wireless Microsensor Networks", Proc. 33rd Hawaii Int. Conference on System Science, Vol. 2, 4-7 Jan,2000.
[16]. Wu Xinhua, "Performance Comparison of LEACH and LEACH-C Protocols by NS2," 9th Int. Symposium on Distributed Computing and Applications to Business, Engineering and Science, 5 October,2010.
[17]. Yuling Li, Luwei Ding, FengLiu, "*The Improvement of LEACH Protocol in WSN"*,2011International Conference on Computer Science and Network Technology IEEE.