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A NOVEL TECHNIQUE OF SELF ORGANIZED & MULTIROUTING BASED PROTOCOL FOR ENHANCING THE DISTRIBUTE ENERGY IN WSN

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ABSTRACT: WSNs are utilized in environmental observation, security, medical applications, etc. The device nodes are typically every which way deployed in a very specific region. These device nodes collect their information and send it to the base Station (BS) via some routing protocol. These nodes can't be recharged from time to time to stay them alive. They have to follow a protocol that must make sure the efficient use of their power, so those nodes could function long as potential to none external help. A routing technique plays a key role in their energy consumption. Several of the routing protocols use clustering as their routing technique. The most objective of all routing protocols is to reduce the energy consumption, so the network period of time and notably the soundness period of the network are also enhanced. By network lifetime, we tend to mean the time period from the beginning of the network until the death of the last node, whereas, stability amount suggests that the time period from the beginning of the network until the death of the primary node. This has objected to develop an energy efficient inflated period of time threshold sensitive clustering rule by dynamic choice of cluster heads using multi-hops and multi-path, that results in load equalization on different-different clusters. This ends up in the enhancement of cluster heads or traditional nodes network period of time and comparison of performance of the proposed protocol with through advance hybrid (LEACH & TEEN).It will enhance the energy use for nodes of WSN. Conclusively enhancing the life time of network.

Key Words: Self Routing Protocol, WSN, LEACH, TEEN, MATLAB

I. INTRODUCTION

A wireless sensor network is a collection of sensor nodes with limited power supply and constrained computational and transmission capability. Due to the limited transmission and computational ability, and high density of sensor nodes, forwarding of data packets takes place in multi-hop data transmission. Therefore routing in wireless sensor networks has been an important area of research in the past few years. The sensor nodes run on non-rechargeable batteries, so along with efficient routing the network should be energy efficient with efficient utilization of the resources and hence this is an important research concern. Advances in wireless Technologies and evolution of low cost sensor nodes have led to introduction of low power wireless sensor networks. Due to multiple functions and ease of deployment of the sensor nodes it can be used in various applications such as target tracking, environment monitoring , health care, forest fire detection, inventory control, energy management, surveillance and reconnaissance, and so on [1]. The main responsibility of the sensor nodes in a network is to forward the collected information from the source to the sink for further operations, but the resource limitations [2], unreliable links between the sensor nodes in combination with the various application demands of different applications make it a difficult task to design an efficient routing algorithm in wireless sensor networks. Designing suitable routing algorithms for different applications, fulfilling the different performance demands has been considered as an important issue in wireless sensor networks.

1.1 Multipath Routing in Wireless Sensor Networks

The restricted capacity and transmission capability of multi hop path and high dynamics of wireless links single path approach is not able to provide efficient data rate in transmission in Wireless Sensor Networks. To overcome these issues now a day's multi-path approach is used extensively. As mentioned before multi-path routing has demonstrated its efficiency to improve the performance of wireless sensor and ad-hoc networks. In the following, we review the gain in performance that can be achieved by using multi-path approach.

1.2 Applications of WNS Sensors

- Military Applications
- Environment Monitoring
- Agricultural Applications
- Support for logistics
- Human Centric Applications

II. LITERATURE SURVEY

S. Taruna1, Rekha Kumawat2, G.N.Purohit3 proposed a multi-hop cluster based routing protocol which is more energy efficient than single hop protocol. Simulation results show that the protocol offers a better performance than single-hop clustering routing protocols in terms of network lifetime and energy consumption by improving FND. These sensor nodes can sense, measure, and gather information from the environment and, based on some local decision process, they can transmit the sensed data and send it to source to destination. A WSN typically has little or no infrastructure. It consists of a number of sensor nodes it may be ten or thousands that working together to monitor a region to obtain data about the environment. These sensors have the ability to communicate either among each other or directly to an external base-station (BS). A greater number of sensors

allows for sensing over larger geographical regions with greater accuracy. The sensor sends such collected data, usually via radio transmitter, to a command center (sink) either directly or through a data concentration center (a gateway).In the wireless network there is no. node by which we can communicate .the number of node make a cluster and within the cluster all nodes make cluster head. The cluster head communicate with base station through another cluster head. Those whose distance is less to the base station they can communicate direct to the base station of cluster which contain no. of nodes and these nodes make cluster head with in cluster. These cluster head communicate with the base station.

Taruna, 2Sheena Kohli 3G.N.Purohit Computer Science Department, Banasthali University, Rajasthan proposed a routing algorithm is related with energy and distance factors of each nodes. This scheme is then compared with the traditional LEACH protocol which involves selecting the cluster head which is nearest to the particular node. We conclude that the proposed protocol effectively extends the network lifetime with less consumption of energy in the network.

Avani Patel1, Chandresh R. Parekh proposed an only deals with cluster based hierarchical protocol TEEN (Threshold Sensitive Energy Efficient Sensor Network Protocol). The sensor network architecture in TEEN is based on a hierarchical clustering. TEEN is data-centric, reactive, event-driven protocol which is best suited for time critical application. It transmits data based on hard threshold and soft threshold values. If the thresholds are not reached, then nodes will never communicate.

Md. Zair Hussain1, M. P. Singh2 and R. K. Singh3 1Maulana Azad College of Engg. & Tech., Patna, India proposed the routing protocols differ on the basis of application and network architecture. With awareness is a compulsory design criterion, many new protocols have been specifically designed for routing, power management and data dissemination. Efficient routing in a sensor network requires that routing protocol must minimize network energy dissipation and maximize network lifetime.

Aswini Kavarthapu: Department of Computer Science and Engineering, QIS College of Engineering and Technology, Ongole, Andhra Pradesh, India. Narasimha Rao Sirivella proposed a method faulty sensor node is detected by discrete path selection technique by compare the actual RTT with present RTT. This method is simulated in NS2 on WSNs with eight sensor nodes designed using circular topology.

Pavithra B Raj1, R Srinivasan2 proposed a fault node recovery algorithm in order to enhance the lifetime of a wireless sensor network when some of the sensor nodes shut down. A wireless sensor network (WSN) often contains hundreds or thousands of sensor nodes equipped with sensing, computing, and communication devices such as short-range communication devices over wireless channels. These nodes may be distributed over a large area. The sensor nodes in WSNs equipped with batteries for their energy source, but it is inconvenient to recharge or replace batteries because of the sudden giving off energy.

Yanwei Wu et. al designed TDMA based MAC layer protocol. In this protocol time slots were used for various sensor nodes to schedule their operations. These time slots were used for various radio activities that sensor nodes carry out. However TDMA based scheme may result in inefficient allocation of time slots with possibility of idle time slots where no station sends any data.

Shibo He et. al. design the distributed MAC layer protocol that schedules the wireless sensor stations. Authors argue the there is strong correlation between MAC layer and routing layer and thus to improve the MAC layer based scheduling it is necessary to consider various routing parameters. They design the protocol using routing, power control, and link-layer random access parameters. They develop a probabilistic mathematical model to improve the MAC layer scheduling by obtaining optimal solution.

Alma et. al. propose a wake up scheduling based scheme for wireless body area sensor networks. Usually in MAC layer based scheduling wireless sensors stations keep doing sensing activity even during idle slots .In this paper based on human body data, various traffic patterns are identified and sensors are scheduled according to various traffic conditions. This scheme effectively utilizes time slots by considering variable traffic conditions but is not applicable for broad spectrum of WSN applications as time intervals identified for wakeup scheduling are only for body area wireless sensor networks.

III. MOTIVATION

The design of the clustering technique in Wireless sensor network is influenced by the limited power of the battery that mandate to design the energy efficient clustering protocol. Much researches has been done in the recent past investigating different aspects like low power protocol, network establishment, coverage problems and the establishment of reliable wireless sensor networks. But, even after many efforts, there are still design options open for improvement. This leads to motivate me to devise a new protocol which enables more efficient use of scare resources at individual sensor nodes for an application.

IV. PROPOSED WORK

This thesis explored the Architecture of clustering protocol and designed an algorithm for improving their network life time and energy consumption for self organized node. This required to decide the tool to implement follows proposed method and also studied the basics of tool.

4.1 Paper Proposal

Developing a self organized node for WSN introduced the idea of multihop and multipath. Due to cluster change continuously it has to necessary for node to have the feature like multimode and multipath. This will use multi-hop and multi-path for increasing the network life and decreasing the consumption of power. The power consumption will be less due to load balancing on cluster heads of every cluster. Then Compared to traditional networks, sensor networks have rather different characteristics and quality measurements. Because of the high collaboration of sensor nodes and very specific application goals, there is no "one size fits all" solution to routing, so the specific characteristics decide

what routing mechanism to use. In this thesis we have made simulations that show that asymmetric communication with multi hop extends the lifetime of large cluster based sensor networks. We have also investigated the usefulness of enforcing a minimum separation distance between cluster heads in a cluster based sensor network to prolong network lifetime.

V. RESULT AND DISCUSSION

5.1 Simulation

To evaluate the performance of our protocol, we have implemented it on the MATLAB simulator with the integrated model of Advance Clustering protocol. Our goals in conducting the simulation are as follows: Compare the performance of proposed work with earlier clustering technique SEP, LEACH and TEEN, etc. Proposed work based on clustering and self organizing nodes through the energy dissipation give longevity of the network. The simulation has been performed on a network of 50 nodes and a fixed base station. The nodes are placed randomly in the network. All the nodes start with a some initial energy. Cluster formation is done as in the SORP(Self Organized routing protocol) protocol .However, their radio model is modified to include idle time power dissipation (set equal to the radio electronics energy) and sensing power dissipation (set the radio electronics energy).

5.2 Simulated Environment

For our experiments, we simulated an environment with varying temperature in different regions. The sensor network nodes are first placed randomly in a bounding area of 100x100 units. The actual area covered by the network is then divided into four quadrants. Each quadrant is later assigned a random temperature between 0F and 260F every 15 seconds during the simulations. It is observed that most of the clusters have been well distributed over the four quadrants.

5.3 Simulation Output

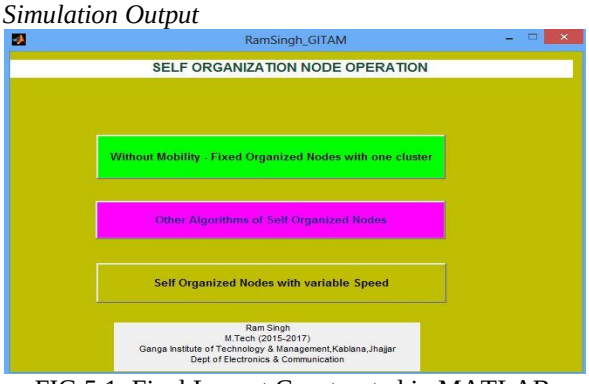

FIG 5.1: Final Layout Constructed in MATLAB

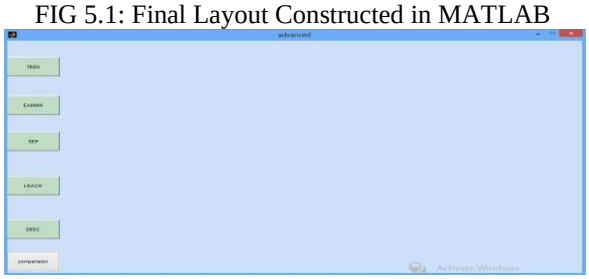

Fig 5.2: Other Self Routing Mechanics (Techniques) executed through Given Button

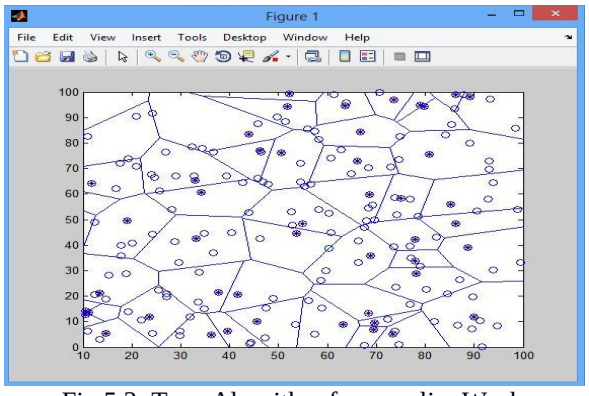

Fig 5.3: Teen Algorithm from earlier Work

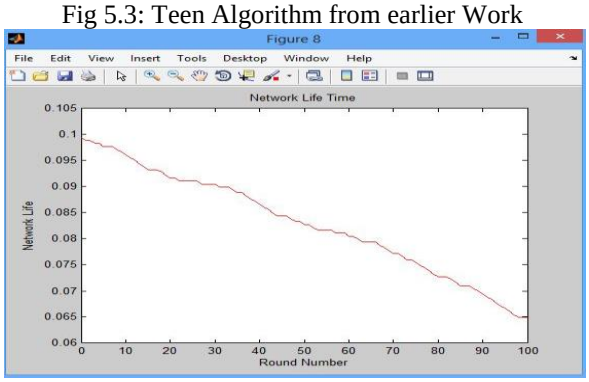

Fig 5.4: Network Life Time VS round (TEEN)

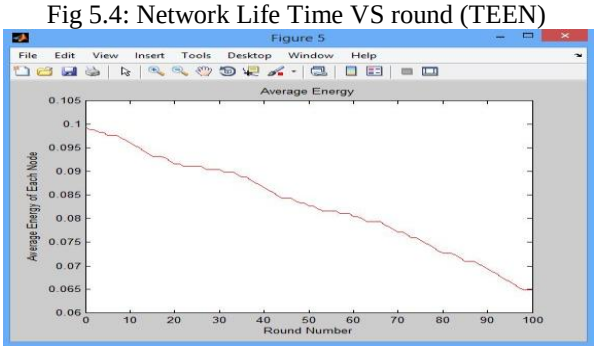

FIG 5.5: Avg. Energy Vs Round (TEEN)

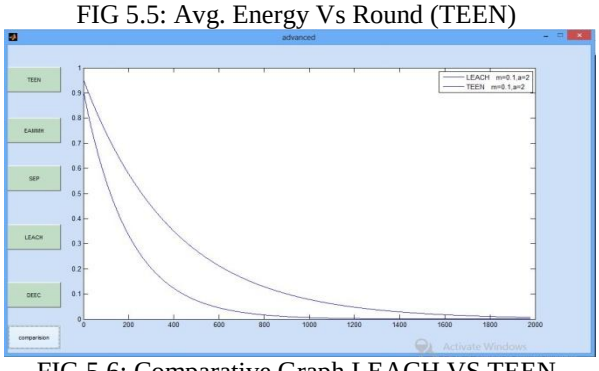

FIG 5.6: Comparative Graph LEACH VS TEEN

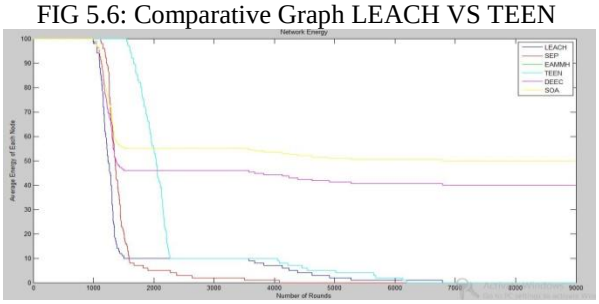

Fig 5.7: Network Energy Vs Round

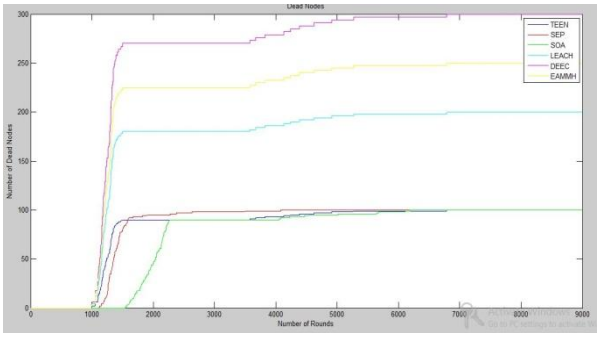

Fig 5.8: Dead Node Vs Round

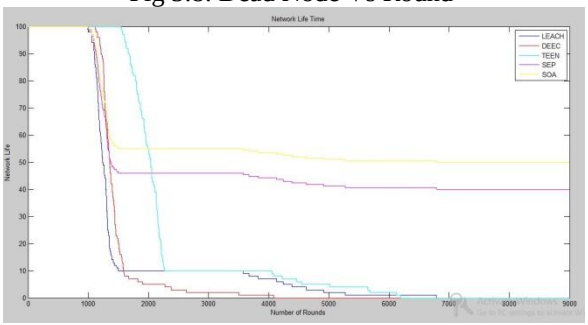

Fig 5.9: Network Life Time Vs Round

Cluster formation is done as in the SOA (Self Organized Algorithm) protocol .However; their radio model is modified to include idle time power dissipation (set equal to the radio electronics energy) and sensing power dissipation (set the radio electronics energy). Compare the performance of proposed work with earlier clustering technique SEP, LEACH and TEEN, etc. Proposed work based on clustering and self organizing nodes through the energy dissipation give longevity of the network. Last three figure Come out after the simulation is clearing showing the proposed SOA is high value in every respect that have success in all round of communication.

VI. CONCLUSION AND FUTURE SCOPE

In WSNs, sensors can be deployed either randomly or deterministically. A random sensor placement may be suitable for battlefields or hazardous areas while a deterministic sensor placement is feasible in friendly and accessible environments. In general, fewer sensors are required to perform the same task with a deterministic placement. WSNs are typically deployed in hazardous or inaccessible environments and hence the sensor nodes' energy supply is usually limited and cannot be renewed. Due to these limitations, the nodes' energy consumption must be minimized, while still maintaining the network's connectivity to maximize its useful lifetime. The nodes communicate wirelessly and often self-organize after being deployed in an ad-hoc fashion. These self-organizing sensor networks have limitations of system resources like battery power, communication range, memory space and processing capability. Low processing power and wireless connectivity make designing such networks a real challenge. Self-organization can be defined as the process by which systems tend to reach a particular objective with minimal human interference. . Moreover, nodes may fail (either from lack of energy or from physical destruction), and new nodes may join the network. Therefore, the network must be able to periodically reconfigure itself so that it can continue to function. Individual nodes may become disconnected from the rest of the network, but a high degree of connectivity must be maintained. Scalability requires that any configuration process be completely distributed and use only local information, which presents the classic problem confronting all self-organized systems that how to obtain global optimality from local adaptation in future.

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