Mobile Wireless Sensor Network Using Different Techniques

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Abstract: The Mobile WSN technique is having mobile nodes in the network. The both sensor nodes and mobile sink can be mobile or there can be mixed sensor nodes. The mobile as well as static sensor nodes in the network based on the application requirements. The routing in mobile WSN poses research issues as nodes are mobile, so it needs to send the data according to the routing protocol while it is moving. So the routing protocols have been proposed considering mobile nodes in the network focusing on research issues like packet loss, energy consumption, and delay. In this paper, the cluster based routing protocols that have been proposed for mobile wireless sensor network are discussed and comparison is done among them.

Keywords: WSN, MobileSink, Cluster, Node, etc.

I Introduction

It is possible to say that history of sensor network technology originates in the first distributed sensing idea implementations. In continuous work of researchers and engineers over sensor networks which lately became wireless sensor networks (WSNs) has started exactly with this idea. Like many other technologies, distributed sensing was firstly introduced by the military. The first system which has all the characteristics of sensor networks (distribution, hierarchical data processing system) is Sound Surveillance (SOSUS) System, which was made to detect and track submarines. SOSUS consisted of the acoustic sensors (hydrophones) settled on the ocean bottom.
But for practical use distributed sensing with a great number of sensor nodes is of much more interest. The first steps to creating such systems were the following projects: Wireless Integrated Network Sensors (WINS), which started in 1993, and Low power Wireless Integrated Micro sensors (LWIM), which started in the mid-1990s.

A wireless sensor network (WSN) of spatially distributed autonomous sensors to monitor physical or environmental conditions, example temperature, pressure, sound,etc. and to cooperatively pass their data through the network to a main location. The more modern networks are bi-directional, an also enabling control of sensor activity. In development of wireless sensor networks was motivated by military applications such as battlefield surveillance; the today such networks are used in many industrial and consumer applications, such as machine health monitoring, industrial process monitoring and control, etc.

Wireless sensor network is a collection of sensor nodes interconnected by wireless Communication channels. In each Sensor node is a small device that can collect data from its surrounding area, communicate with other Sensors or with the base station (BS) and carry out simple computations. Recent years have observed an increasing interest in using wireless sensor networks (WSNs) in many applications, and including environmental monitoring and military field surveillance. They applications, small sensors are deployed and left unattended to continuously report parameters such as temperature, humidity, and chemical activity. A reports transmitted by these sensors are collected by observers. The dense deployment and unattended nature of WSNs makes it quite difficult to recharge node batteries.

I. Wireless Sensor Network (WSN)

Wireless sensor network is a popular area for research now days, in due to vast potential usage of sensor networks in different areas. The sensor network is a comprised of sensing, communication ability which helps to observe, processing, instrument, react to events and phenomena in a specified environment. This kind of network enables to connect the physical world to environment. By networking tiny sensor nodes, becomes easy to obtain the data about physical phenomena which was very much difficult with conventional ways. A Wireless sensor network typically consists of tens of thousands of nodes. These nodes collect, process and cooperatively pass this collected information to a central location. WSNs have unique characteristics such as a low duty cycle, power constraints and limited battery life, redundant data acquisition,

heterogeneity of sensor nodes, mobility of nodes, and dynamic network topology, etc. Sensor network is relatively new having short history. Addition to that, these networks are autonomous and frequently require topology changes upon external intervention.

The prime objective of wireless sensor network is to collect data from node and deliver it to sink for further processing. To utilize wireless sensor network effectively one must develop a plan that combines the proposed applications with the underlying individual device hardware capabilities. Recently, WSNs have raised considerable interest in the research community thanks to their decisive advantages in real-time data processing at a minimal cost. Advancement in technologies further made technical and economical manufacturing of miniature low cost sensors a reality. Their capability to organize spontaneously in area of interest, particularly for autonomous operation and expand and maintain a resilient network of individual measurement points to give them an edge. Data is generally routed to the adjacent node or to the sink on stimuli. Several data routing protocols have been proposed in wireless sensor networks. A brief description of data routing in WSNs is discussed herein in shown fig. 1.
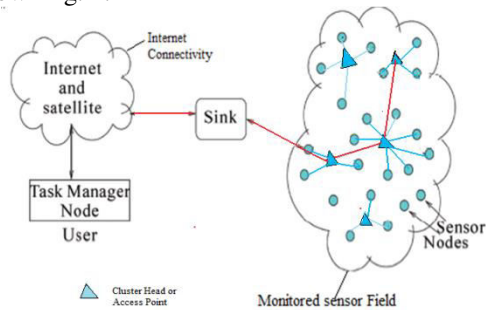

Fig. 1 Wireless Sensor Network Process

II Related Work

The many researchers have been done in field of economic dispatch problem some of the work is described in this paper.

Saravanakumar, et.al, [1], have donr research work on WSN. It consisting of a huge number of sensors is efficient for gathering the data in a selection of environments. Such as the sensor operates on battery of limited the power, it is big challenging aim to design an energy efficient routing protocol, which can minimize the delay while offering high-energy efficiency and long span of network lifetime. Author analyzes the basic distributed clustering routing protocol Low Energy Adaptive Clustering Hierarchy, also proposed a new routing method and data aggregation method in which the sensor nodes form the cluster and the cluster-head elected based on the residual energy of the individual node calculation without re-clustering and the node scheduling scheme is adopted in each cluster of the WSN. Output using MATLAB shows that the proposed routing protocol significantly reduces energy consumption and increase the total lifetime of the wireless sensor network compared to the LEACH protocol.

Ahmad, et.al, [2], investigated on Cluster based routing method is most popular routing method in WSNs. Due to varying need of WSN application efficient energy use in routing protocols is at rest a potential field of research. In this research authors introduced new energy efficient cluster oriented routing method. This method is used to overcome the basic difficulty of coverage hole and energy hole. In their method they have controlled these problems by introducing density controlled uniform distribution of nodes and fixed optimum number of Cluster Heads in each round. At the last authors had verified their methodology by simulation results in MATLAB.

M.S., Javaid, et.al, [3], worked on the advent and development in the field of Wireless Sensor Networks in recent years has seen the growth of extremely small and low-cost sensors that possess sensing, the signal processing and the wireless communication capabilities. The sensors can be expended at a much lower cost and are capable of detecting conditions such as temperature, sound, security or any other system. Authors have compared six different protocols of different scenarios which are presenting their own schemes of energy minimizing, the clustering and route selection in order to have more effective communication. This work is to have an insight that which of the under consideration protocols suit well in which application and can be a guide-line for the design of a more robust and efficient protocol. MATLAB simulation results are performed.

Beiranvand, Z., et.al, [4], worked on large amount of energy on nodes of a WSN is consumed owing to the inner-network communications. An energy efficient routing algorithm is proposed which saves a important part of inner-network communications energy. The proposed routing method selects the sensor nodes with higher residual energy, extra neighbors, and lower distance from the Base Station as Cluster Head nodes. When, it manages sensor nodes suitably and constructs clusters this way to

maximize WSN lifetime and reduce average energy dissipation per every sensor node. To approximation the proposed routing method, the proposed routing method has been compared with the previous proposed algorithms for example LEACH, DBS, and LEACH-C algorithms. Results of the simulation show that the proposed routing scheme has been improved the WSN act at least 65%, reduce the energy consumption of the WSN up to 62%, & improve the effectively delivered packet ratio at least 56% as compared to the previous routing scheme

Lohan, P., et.al, [5] presented the Geography-Informed Sleep Scheduling and Chaining Based Routing (GSSC) algorithm in wireless sensor network. As sensor nodes are energy constraint, the network lifetime by utilizing the energy of nodes very efficiently. GSSC saves energy by finding out equivalent nodes from routing perspective by using their geographical information the nodes, it sense almost same information and then turning off unnecessary nodes to remove data redundancy. To reduce the energy consumption of communication in network they use chaining based routing scheme to route the sensed data from active nodes to the base station. This chaining has been based data routing can reduce energy consumption of data transmission with the help of multi-hop routing concept. Our simulation results (using MATLAB) show that in comparison of very famous routing protocols like LEACH and PEGASIS, that algorithm has achieved significant increment in network lifetime.

You-Chiun Wang, et al, [6], considered a hybrid wireless sensor network with static and mobile nodes. Static sensors monitor the environment and report events occurring in the sensing field. They scheduled the mobile sensors' traveling paths in an energy-balanced way so that their overall lifetime could be maximized and they shown that it has been a NP-complete problem. They proposed a centralized and a distributed heuristics to schedule mobile sensors' traveling paths. Their heuristics allowed arbitrary numbers of mobile sensors and event locations in each round and had an energy-balanced concept in mind. The centralized heuristic tries to minimize mobile sensors' moving energy while keeping their energy consumption balanced.

Mohamed Hafeeda, et.al, [7], proposed a new probabilistic coverage protocol (denoted by PCP) that considered probabilistic sensing models. PCP was fairly general and used with different sensing models. In particular, PCP required the computation of a single parameter from the adopted sensing model, while everything else remained same. They showed how this parameter could be derived in general, and the calculations for two example sensing models: (i) the probabilistic exponential sensing model, and (ii) the commonly-used deterministic disk sensing model. They compared their protocol with two existing protocols and claimed for the better performance as they proposed.

III Conclusions

Routing in Mobile wireless sensor network is one of the most important research issues now a day. Most of the applications now a day require mobility of the nodes. In this paper routing protocols for Cluster Based wireless sensor network has been studied and based on that comparison is being made. The various papers and literature has been studied for mobile wireless sensor network.

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