



ENERGY EFFICIENT PROTOCOL IN WIRELESS SENSOR NETWORK

Arti Thakur¹, Sumeet Singh¹, Utkarsha Patil¹, Gaurav Wagh²

¹*B.E Student, Dept. of Information Technology Engg., UCOE Mumbai*

²*Faculty, Dept. of Information Technology Engg., UCOE Mumbai*

Abstract --- Wireless Sensor Network (WSN), also known as sensor and actuator networks (WSAN) typically consists of large number of low-cost and low-power wireless sensors. Sensors measure and monitor ambient conditions in surrounding environment such as heat, pressure, etc. Energy Efficient is very important in WSN Routing protocols Low Energy Adaptive Clustering Hierarchy with Deterministic

Cluster-Head Selection (LEACH), Improved Energy Efficient PEGASIS Based Protocol (IEEPB), Distributed Energy Efficient Clustering(DEEC),Stable Election Protocol (SEP) are not sufficient to overcome the energy dissipation of sensors so Mobile Sink based Adaptive Immune Energy-Efficient Clustering Protocol (MSIEEP) is implemented to maximize network lifetime. Energy hole problem is critical issue for data gathering in WSN. MSIEEP uses AIA (Adaptive Immune Algorithm) is used to find the optimum number of Cluster Heads(CHs) to improve the lifetime and stability period of the network. Performance of MSIEEP is compared to various protocol to deliver Packets to destination.

Keyword --- WSAN, Sensors, Clustering, LEACH, IEEPB, DEEC, SEP, TEEN, WSN

I. INTRODUCTION

The Wireless Sensor Network (WSN), a specialized network, consists of two main components: Sensor Nodes and Base Station. The nodes monitor various environmental conditions such as temperature, pressure, sound and share (wirelessly) the information obtained with either the base station or amongst various nodes. WSN is foreseen to be appropriate solutions to many applications in fields of defense, industry monitoring, health monitoring, etc.

A military example is the use of sensors detect enemy intrusion; a civilian example is the geo-fencing of gas or oil pipelines The medical applications can be of two types: wearable and implanted. Wearable devices are used on the body surface of a human or just at close proximity of the user. The implantable medical devices are those that are inserted inside human body. There are many other applications too e.g. body position measurement and location of the person, overall monitoring of ill patients in hospitals

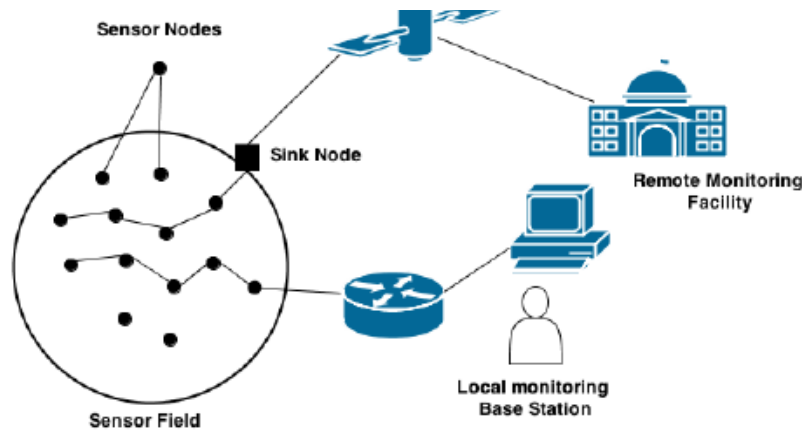


Fig 1.1

and at homes. Body-area networks can collect information about an individual's health, fitness, and energy expenditure. There are many applications in monitoring environmental parameters, examples of which are given below. They share the extra challenges of harsh environments and reduced power supply.

II. EXISTING SYSTEM

The Existing System is based on mobile sink based Adaptive Immune Energy-Efficient Clustering protocol (MSIEEP) to alleviate energy holes. MSIEEP uses Adaptive Immune Algorithm (AIA) to guide the mobile Sink based on minimizing total dissipated energy in communication and overhead control packets.

Existing System consists of Three Phases:

1. **Initial Phase:** The sink initializes the network by defining the number of nodes(N), data packet Size(K), etc. Then the sink divides the sensor fields into R equal Size region, Where N/R nodes are deployed randomly in regions.

2. **Setup Phase:** After initialization , mobile Sink goes to center of r th region($r=1,2..r$) and uses AIA to find its sojourn location and locations of the optimum CHs are selected and members of each CH are assigned, the sink broadcasts two short messages using ID and logic 0.TDMA schedule is used to avoid intra-Cluster interface.

3. **Steady Phase:** Using CDMA schedule nodes sends data in assigned slot to its CHs and sink visits all the R regions.

III. PROPOSED SYSTEM

A. TECHNIQUE

In our protocol MSIEEP we used a control mobile sink that guided based on minimizing the dissipated energy of all sensor nodes. The sensor field is divided into R equal size regions to conserves energy since data is transmitted over fewer hops. MSIEEP protocol reduces the number of dropped packets. It improves the lifetime, the stability and the instability periods over the previous protocols and selects the CHs from high energy nodes. To use GPS to locate geographical location of each node

INITIAL PHASE

In this phase, the sink initializes the network by defining the number of nodes, the data packet size the control packet size, the size of sensor field and the parameters of the radio model. Then the sink divides the sensor field into R equal size regions; where N/R nodes are deployed randomly in each region. Sink initially moves to center of each region and requests ID, position and E_0 of all sensor in each region.

SETUP PHASE

After initialization, the mobile sink goes to center of r th region ($r=1,2,\dots,R$) and uses AIA to find the sojourn location and locations of the optimum CHs based on the minimization of the total dissipated energy in communication. Once CHs are selected and members of each CH are assigned, the sink broadcasts two short messages. The first one is sent to the selected CH to inform each one by IDs of its members. The second message contains CH ID and logic 0 is sent to member nodes to inform each one where will join. TDMA schedule is used to avoid intra-cluster collisions and reduce energy consumption between data messages in cluster head and enables member to off the equipment when not in use.

STEADY PHASE

In this phase, nodes start sensing the data and moves according to TDMA schedule. Once each CH received sensed data from its member nodes, it performs signal processing to aggregate data in single packets. H moves accordingly to $(R+1)$ regions until the sink visits all R regions to complete data collection.

ALGORITHM PHASE

Finding appropriate number of CHs and the sojourn location of the mobile sink are critically important issues to improve the network lifetime and the consumption energy. In pseudo code, the mobile sink finds the sensors nodes that have residual energy equal or larger than the average energy of all live nodes in a region r by constructing the sensor set. Most energy of the sensor node dissipates in the communication process and overhead control packets. So, the main factor we need to minimize is the dissipation energy. In addition, the number of CHs can factor into the objective function. Fewer CHs result in greater energy efficiency and higher CHs consume more energy as CHs drain more power than non-cluster-heads. Therefore, AIA is used to determine the mobile sink location and the optimal number of clusters and their locations in r th region by minimizing.

ANALYSIS PHASE

Network lifetime: The time interval from the start of network operation until the death of the last alive sensor.

Instability Period: The time interval from the death of the first sensor until the death of the last sensor.

Throughput: It measures the total rate of data sent over the network, including the rate of data sent from CHs to the sink and the rate of data sent from the nodes to their CHs.

B.SCOPE OF THE PROJECT

1. **Area monitoring:** Area monitoring is a common application of WSNs. In area monitoring, the WSN is deployed over a region where some phenomenon is to be monitored. A military example is the use of sensors detect enemy intrusion, a civilian example is the geo-fencing of gas or oil pipelines.

2. **Health care monitoring:** The medical applications can be of two types, wearable and implanted. Wearable devices are used on the body surface of a human or just at close proximity of the user. The implanted medical devices are those that are inserted inside human body. Body position measurement and location of the person overall monitoring of ill patients in hospitals and at homes.

3. **Environmental/Earth sensing:** There are many applications in monitoring environmental parameters. Air pollution monitoring enables to monitor the concentration of dangerous gases for citizens. Forest fire detection enables to detect a fire in the forest and how it is spreading. Landslide detection make use of a wireless sensor network to detect the slight movement of soil and changes in various parameter that occur before or during landslide.

4. **Industrial monitoring:** Data logging is used for the collection of data for monitoring of environmental information this can be as simple as the monitoring of the temperature in a fridge to the level of water in overflow tanks in nuclear power plants.

5 **Structural health monitoring:** It can be used to monitor the condition of civil infrastructure and related geo-physical processes close to real time and over long periods through data logging.

IV. FUTURE SCOPE

Wireless sensor networks represent a very interesting multidisciplinary field of research, characterized by a very large number of possible applications. Their main advantage is the ability to be applied to any field, and in any environment unlike standard networks that for its application require substantially stringent conditions. Future scenarios "Are Aware of the World" or "Internet of Things" are as real scenarios, and there are good chances to achieve in the next ten years. All authors have also pointed to the increasing technological challenges. Sensor networks can provide in the future a very heterogeneous data: images, sound, distance, acceleration, and perhaps smell, taste, etc. In future, sensor network will be everywhere in order to make future technologies/environment/infrastructure as smart as possible as

IV. CONCLUSION

Wireless Sensor Networks are categorized into proactive and reactive sensor networks. In Proactive sensor networks, nodes at regular intervals switch on their sensors transmitters, sense the atmosphere and transmit the data on hand with them. Wireless Sensor Network nodes are battery supplied which were implemented to carry out a specific assignment for a comprehensive period of time may be years. The purpose of this project is to improve Energy Efficiency as compared to other routing protocols. The mobile sink based Adaptive immune Energy Efficient clustering protocol (MSIEEP) improves the lifetime, stability and instability periods over protocols and also increases the ability to deliver packets to destination.

- To apply clustering algorithm
- To be energy aware and avoid large amount of energy consumption
- To reduce number of dropped packets
- To use GPS

V. REFERENCES

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