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Optimal Clustering Algorithm Network Design to Evaluate Performance of Wireless Sensor Networks

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Abstract— Wireless sensor network is an advance class of system comprises of complex mechanism energy efficient radio interface used in this network. Collected sensor information used for communicating connected nodes in the sensor network. Sensors used in this network vary in size depending upon complexity of individual bandwidth. In this paper, we use different kind of protocol for comparing and evaluate energy consumption that is require, maintain cluster in order to improve life time of wireless sensor network. Wireless sensor network is a group of specify transducer with communication infrastructure for monitoring and recording condition for better performance.

Keywords— Wireless sensor network,Clustering, Energy consumption, Energy efficient, Network.

I. INTRODUCTION

Wireless sensor network is latest and hot area of research now a days. Wireless sensor network is used to collect and monitor information from different location. This information is sent to different base station for gathering data. This major difference between wired network and wireless network is their decentralized and specialized nature.Recently, the research community has proposed a robust aggregation framework called *synopsis diffusion* whichcombines multipath routing schemes with duplicate-insensitive algorithmsto accurately compute aggregates (e.g., predicate Count,Sum) in spite of message losses resulting from node and transmissionfailures. However, this aggregation framework does not addressthe problem of false subaggregate values contributed by compromisednodes resulting in large errors in the aggregate computedat the base station, which is the root node in the aggregation hierarchy.

1. The system of the network is to sense the environment and report what happensin the area it is deployed in. Sensor networks have a set ofapplications in military; they are used for battlefieldsurveillance and object tracking. They are used for seismic data collection and reporting. It is also used inmonitoring failing in building structure or vehicles andairplanes. Wireless during the localization phase for such applications the physical locations of sensor nodes are kept t secret.
2. Globally, a number of secure location estimation schemes have been proposed from various perspectives, but some important constraints of sensor nodes are often ignored. The considered limitations during design of those schemes vary with respect to varying research perspective. In this study, we propose a novel security framework for secure location estimation of sensor nodes suitable for security-sensitive WSN applications as shpown in figure1.

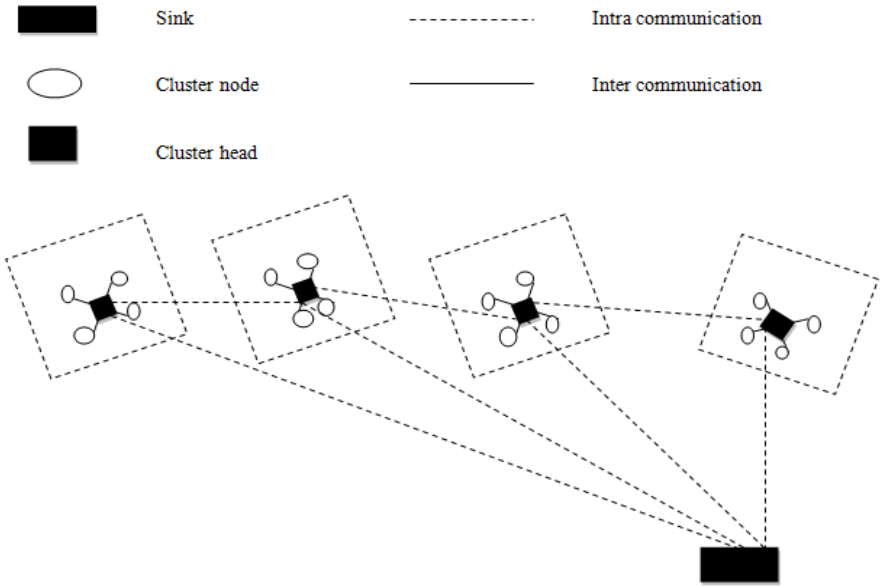


Figure1. Clustering Mechanism

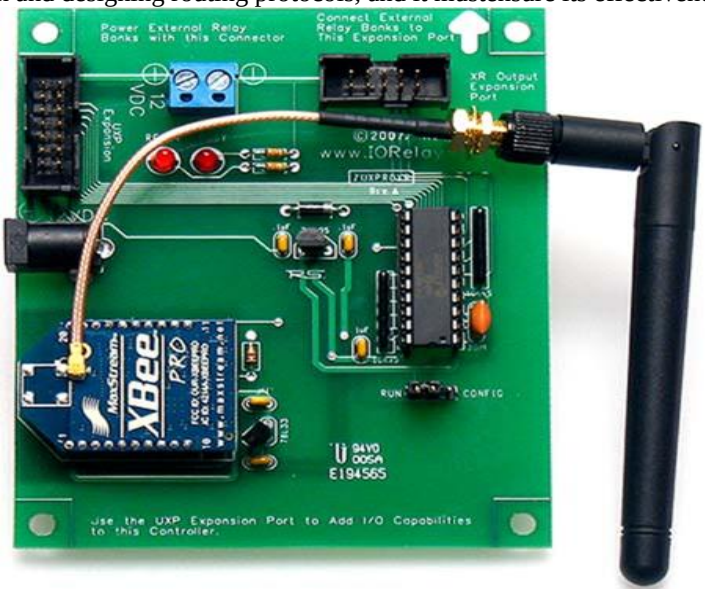
3. The proposed framework aims to provide security, scalability, adaptability and optimize power consumption during the secure locationestimation phase of a wireless sensor network. In this paper we use different protocol used to address following issues:

- Lifetime: - We must contact in case of life time for better energy consumption.
- Fault tolerance: -It is also considered as better accept for energy consumption.
- Self-configuration:- Its depends upon information that we collected through sensor node while deploying network.

II. RELATIVE WORK

We large numbers of researcher have proposed so many methods. Most of algorithms are heuristic in nature and their aim is to generate minimum number of cluster. Let us consider that is a sensor network can be composed of thousands of nodes algorithms and also we known that nodes are dispersed in 2-dimensional space and cannot be recharge after deployment. Assume that the nodes are quari-stationary and nodes transmit at the same fixed power level, which is dependent on the transmissions distance. Various algorithm assumptions are described below

1. Nodes base decisions on local information. Nodes are location aware, which can be defined using GPS, signal strength as direction. The energy consumption among nodes is not uniform.Based on existing correlative researches,
2. We propose a more accurateanalytical method of energy consumption, andinvestigate the calculation method and formula for thedensity of sensor nodes in different regions of networkunder the condition of suboptimal uniform energyconsumption. Through numerical analysis andsimulation,
3. We prove the correctness of ourconclusions.Each cluster head expends energy during transmission to and reception from other cluster heads, and also expendsenergy during reception from the sensing nodes within itscluster. In the case of a sensing node, energy is expendedduring the capturing of data and subsequent transmission of thedata to its cluster head. Furthermore, a sensing node alsoconsumes energy while in idle mode.
4. We assume that thesensing energy consumption is fixed, this assumption isjustified for a given application and environment beingmonitored. We also assume the worst case condition that thesensing nodes are always active so that the idle mode energy iszero.
5. First, the nodes in the monitoring area transfer the data information to the sink nodes throughmulti-hop ad hoc networks, and then the sink nodesdeliver the information connected to a satellite or theInternet, and finally, users receive the monitoringinformation by accessing the management node andmaking analyses and decisions on the obtainedmonitoring information.
6. Sink nodes in sensor networksplay a crucial role. In other words, they are animportant bridge between users and the sensor nodeswithin the monitoring region. So, this special role mustbe fully considered during the process of the securityresearch and designing routing protocols, and it mustensure its effectiveness as shown in figure 2.



Figuare2.ZUXPProXR Zombie Interface Module

Meanwhile consider few parameters for operations are:

1) Number of nodes
2) Network grid
3) Sink (data center)
4) Threshold distance
5) Cluster range
6) Data packet size

7) Broadcast packet
8) Packet header size
9) Intra communication
10) Inter communication
11) Initial energy
12) Nodes and CH mobility
13) Overlapping
14) Complexity

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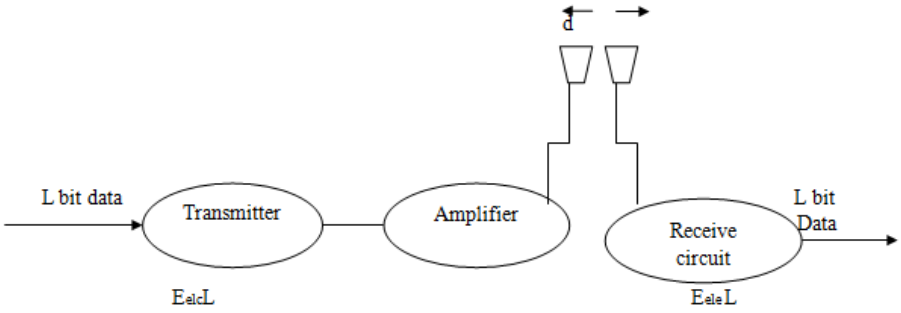

Figure3. Network Model

The classic applications of the wireless sensor network are:

1) First application of wireless sensor network is that life, it has long battery backup. Sensors are placed at different location. Sometime batteries can be replaced, not only will be primary benefit of wireless sensor network be lost, but also many remote sensing applications may become impractical. Therefore, long battery life is essential in wireless sensor networks.
2) It is obvious that devices must be small enough to be embedded in their operating environment. This requirement affects the choice of batteries. Batteriesare too bulky to power the sensor node, so using coin cell batteries is the only option in many situations.
3) It has low data rate that is also one of the application. Since the sampling rate, is usually small, the number of bits transmitted per second by individual nodes is low.
4) Since the number of sensor nodes in a system can be large (multi scale industrial automation application can use number of hundred sensors), the cost of individual nodes must be minimal to be of practical use.
5) These applications consist of a sophisticated central node and several simple end nodes.
   For instance, several different types of sensors in a building are controlled by a signal building automation controller.
6) The requirements of small size and low cost result in limited energy supply on sensor nodes, so energyconsumption is one of the most important metrics in wireless Sensor Networks (WSNs). In order to extendthe lifetime of sensor networks, many efforts have beentaken to reduce the energy consumptions of the hardware,software, communication protocols and applications. Thus, itis necessary to accurately estimate the energy consumptionbehavior of the WSN system when the new techniques andalgorithms are proposed.
7) Three techniques are generallySince in-network processingrequires inter- mediate nodes to access, modify, andsuppress the contents of messages, it is unlikely we can useend-to-end security mechanisms between each sensor nodeand the base station to guarantee the authenticity, integrity,and confidentiality of these messages. Link-layer securityarchitecture can detect unauthorized packets when they arefirst injected into the network. For the above reasons,
8) Link-layer security mechanisms guarantee the authenticity,integrity, and confidentiality of messages betweenneighboring nodes, while permitting in-network processing.
   The security goals of a link layer protocol are listed here asfollowing:

- Access Control and Message Integrity
- Message Confidentiality
- Data Authenticity
- Data Freshness

III. CONCLUSION

With the evolution of these technologies like wireless sensor network has grown enormously in the last decade pointing out the crucial need for scalable and energy-efficient and energy consumption in corresponding large-scale environments. In wireless sensor network there as a large number of sensor that management of the network. Decrease energy consumption and maximize network lifetime are important parameters in designing wireless sensor networks. Cluster is one of the efficient methods in energy consumption by cluster-head in wireless sensor network.

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