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Energy Efficient Transmission Using Grouping Header Centralized Algorithm in Wireless Sensor Network

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Abstract: A group is a collection of data objects that are same types of objects are grouped in one group and different types of objects are grouped in other group. The Grouping is also called Data Segmentation. The sensor node is organized into groups. Within a group, nodes transmit data to group head (GH) without using Compressive Sensing (CS). Analytical model that represents the relationship between the size of groups and number of transmissions in the CS method, aiming at finding the optimal size of groups that can lead to minimum number of transmissions. Then, a new grouping centralized algorithm based on the results obtained from the analytical model. Extensive simulations confirm that our method can reduce the number of transmissions significantly and thus achieve Energy Efficiency and throughput.

Keywords: grouping, group header, compressive sensing, wireless Sensor network, Energy Efficiency and throughput.

I. INTRODUCTION

One of the fundamental tasks for Wireless Sensor Networks is to collect information from the physical world. It is an important issue to reduce the amount of data transmission in wireless sensor network. Compressive sensing can be reduces the amount of data transmission and balance the traffic load throughout the entire network. The system consists of one sink node is collecting all the data from the field. Here the method is used for fault tolerance and traffic load balancing. The method is generally used for better traffic load balancing than the tree data gathering method. A network designer faces several challenges when designing a wireless sensor network. Apart from the wireless sensor medium, the primary challenges for wireless sensor networks stem from two facts. First, sensors nodes are extremely resource constrained. Second, in many applications wireless sensor nodes will be randomly deployed. This randomness raises the issue of self-organization and equally importantly that of dimensioning the sensor network. Scattering too few sensor nodes may result in lack of coverage of the sensor field and a disconnected network. Scattering too many sensor nodes may result in an inefficient network due to increased MAC collisions and interference. From a security standpoint, it is very important to provide authentic and accurate data to surrounding sensor nodes and to the sink to trigger time-critical responses (e.g., troop movement, evacuation, and first response deployment). However, securing wireless sensor networks poses unique challenges to protocol builders because these tiny wireless sensor devices are deployed in not small numbers, usually in unattended environments, are in severely limited in their capabilities and resources (e.g., power, computational capacity, and memory).Therefore, protocol builders must be cautious about utilizing the limited resources onboard the sensors efficiently. In this paper, we focus on locating the target and utilize energy effectively and improve the life time of the sensor network. We propose two methods to derive the relationship between sensor density and network resolution. The first method is based on a sufficient condition on node distribution which guarantees a lower bound of resolution over the whole field. Using this sufficient condition, the problem can be converted to a conventional disk coverage problem. The sensor node is uniformly and independently scatter in a sensor field. All the sensor nodes have the same fixed transmission power and transmission rate. However, this method may overestimate the sensor density required by localization. In order to tighten the bound on the necessary density, we introduce the idea of sector coverage. For the sector coverage grouping model, we only need half the sensor density required by the disk coverage grouping model. Then we propose a distributed algorithm for sector coverage and show its computation complexity. Compared to disk coverage, which can utilize many existing efficient coverage algorithms, a sector coverage algorithm requires more computations. So, the two methods have different merits. The disk model provides a simple, but not very accurate way to estimate the sensor density, while the sector coverage model is more complex and accurate.

II. SYSTEM MODEL

Two levels of transmission in the grouping method. First level of transmission is intra group that is not used compressive sensing technique. Second level of transmission is interring group that is used for compressive sensing technique. Transmission of inter group data size is same as the in data in the intra group. It can reduce the number of transmission can effectively reduce the energy consumption of sensor nodes. An important task of this method is used to determine the size of group. And also it can be used to reduce the number of transmissions significantly and thus achieve Energy Efficiency and throughput.

III. EXISTING SYSTEM

Distributed Energy efficient sensor network scheme denoted by Compressed Sensing. The proposed scheme is suitable for long-term deployment of large underwater networks, Cost is higher compared than other in which saving energy and bandwidth is of crucial importance. Heavy data transmission burden to the sensor nodes. Large time to take data transmission. Limited network lifetime. Sufficient sensing probability used to avoid packet loss. Reconstruction based on compressed sensing is to be received. Heavy data transmission burden to the sensor nodes. Large time to take data transmission, less Quality of Services.

IV. PROPOSED SYSTEM

The grouping method that uses hybrid CS for sensor networks. Sensor nodes are organized into groups. Nodes transmit data to group head (GH) without using CS. GHs use CS to transmit data to sink along a backbone tree that connects all GH's to sink. Thus, reducing the number of transmissions can effectively reduce the energy consumption of sensor nodes. It can be used to reduce the number of transmissions significantly and thus achieve Energy Efficiency and throughput.

A. *Grouping Centralized Algorithm*

Steps Involved In Target Localization Using Sector Coverage Centralized Model Using GHCA

1. To detection of the target by number of sensors when the target enters its coverage area.
2. To communicate with the neighbouring sensors to know which all has detected the target.
3. Now compare the residual energy efficient of all the detected sensors.
4. To select the two sensors that have maximum energy among the detected sensors.
5. To locate the target with the two sensors.

Although each single sensor may not be able to provide precise information about the events, the information about the environment can be reconstructed when the measurements from multiple sensors are combined. Thus, the sensing region to the group of sensors can be much greater than the union of their sensing disks. First, the SCCM is needed and then Second, the DCCM is inadequate for certain applications.

V. System Implementation

Target localization is performed using Grouping Header model and it involves the following modules

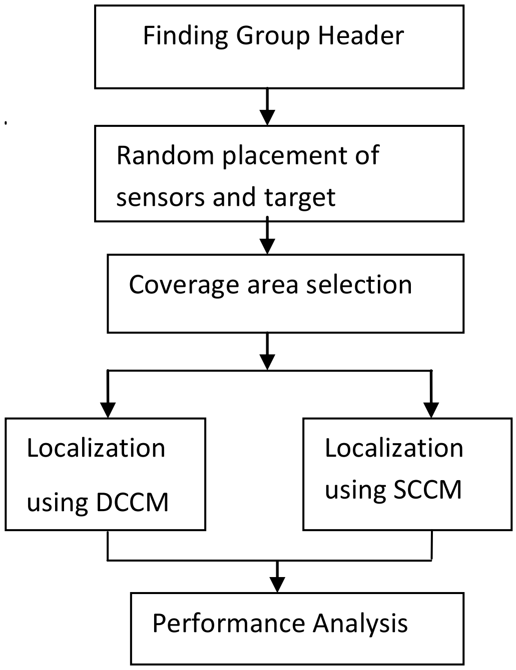

Fig 1: System Architecture

The Proposed system has contains following merits

1. It can reducing the Number of transmissions.
2. Effectively reduce the Energy consumption of sensor nodes.
3. It can increases the Energy Efficiency and Throughput

A. System Modules

Random Placement Of Sensors And Target

Each time when the system is made to run, the sensors are randomly deployed. The sensors are deployed in random positions. Then the target positioning can be done. The location of the sensors that are place in the sensor network should be known so that the location of the target can be calculated.

Assumptions

Number of sensors : 100

Sensor position : Random

Target : any object

Target position : group header

Coverage area : circular

Sensing radius : uniform

Grouping1 color : Red

Grouping2 color : Yellow

Grouping3 color : Blue

Group Header : Black

B. Coverage Area Selection

Sensors are usually powered by batteries. So to utilize the energy of sensors in the right way it is sufficient to select the particular region to execute user query language. This was done to reduce the complexity in calculation and efficiently use minimum number of sensors for locating the target.

C. Target Localization Using Disk coverage centralized method

It can be used for K-means and K-median problem. The coverage of each sensor is assumed to be modeled by a sensing disk for corresponding sensing radius (we use a constant sensing radius but it's not essential). Within its sensing radius a sensor was able to perform measurements, while outside the sensing circle the sensing performance may or may not be degrade. In this DCCM the sensors are responsible the DCCM uses this approach. So when the target has been detected by some sensors then the whole sensors will be locate the target. The DCCM has certain limitations in describing how well the field is covered. First, it consider cooperative detection by multiple sensors. When several nearby sensors are monitoring an event at the same time, the estimation error can be reduced through cooperative signal processing.

D. Target Localization Using Sector coverage centralized method

In high density wireless sensor networks, sensors need to periodically switch to the sleep state to save energy efficient. To ensure that the field was well monitored, the ready state sensors should be provide coverage over the whole field. In other words, a sensor can only go to the sleep state. when there is no coverage hole in its sensing area. Thus, a Grouping Centralized algorithm is needed to check whether there are coverage holes in the field when the positions of the waking sensors are known. For the DCM, a sensor can determine whether its sensing region is k-covered by checking the intersection points of the sensing boundary of its neighbours. This gives an algorithm of complexity O(n), where n is the number of waking neighbours within range of 2r.

VI. PERFORMANCE MEASURE

The performance analysis represents the number of active sensors needed to be localizing the target and the distribution energy required by DCCM and SCCM during locating the target. The required energy efficient needed to be locate the target using DCCM or SCCM can be computed as,

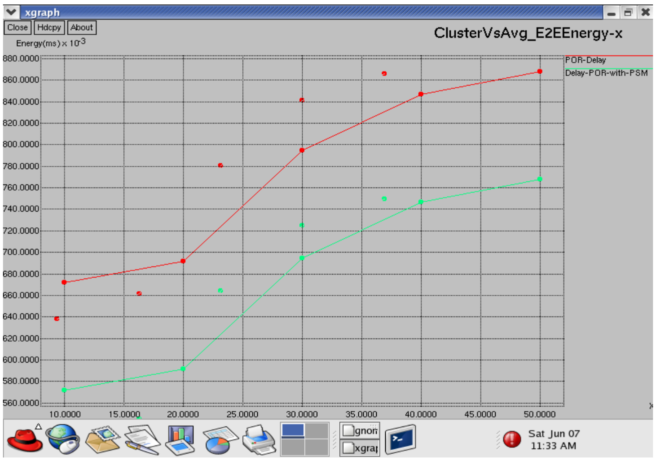

Fig 2 : Performances Measures

A. Energy Consumption Analysis

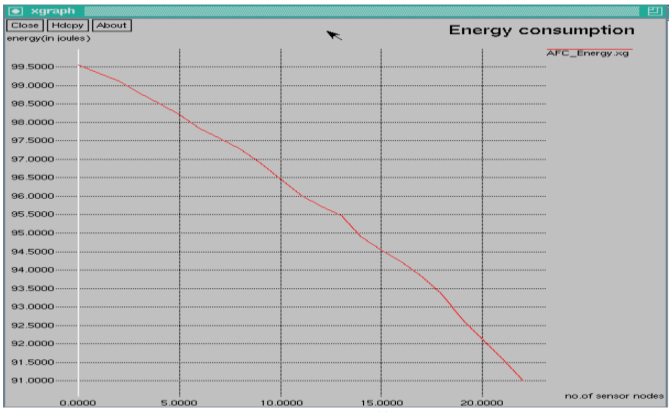

Fig 3 : Energy Efficient

Two other data collection methods are used. They are grouping without used CS method and grouping with CS method can be used. The above two method can be used for used for reducing the number of transmission and to save energy efficient. Node can transmit data to the group header. And it can be located nearly at the centre of the group

VII. CONCLUSION

To design a grouping based data collection method, to reduce the data transmissions in wireless sensor networks. In order to find the optimal size of groups that can lead to minimum number of transmissions and save energy efficient. Then, we proposed a grouping centralized algorithm based on the results obtained from the analytical model. It can be used to save energy efficient, throughput and it can reduces the number of transmission. In future we will introduce transmission efficient grouing algorithm.

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