Abstract

This research paper is used to track the target where we cannot detect the mobile ranges. Wireless sensor nodes help to track the movement of target object. For this we use two mechanism (1) ICTP [information controlled transmission power adjustment scheme] which is used to reduce the power of sensors that does not take part in detecting the target. (2) MISS [mutual information based sensor selection algorithm] which is used to select the sensor that is giving more information about the target when compared to the other target. In this research paper sensors collaborate among themselves and decide which sensor can be used to detect the target by using dynamic scheduling mechanism so that communication delay between the sensor nodes and target can be minimized. Thus main objective of this research is to balance the lifetime of all the sensor nodes in the network to increase the network lifetime and reduce the energy consumption by activating the sensors only when the target arrives in that region. Here we can detect multiple targets by assigning unique id for each sensor.

Keyword: target tracking, collaborate, and power control, Mutual information

1. Introduction

Target tracking is used in remote areas where we cannot detect the mobile ranges. This is mostly used in military application. Sensor nodes in WSNs are battery-operated, which puts an energy constraint on their operation lifetimes. Reducing the energy exhausted by the nodes improves the duration of the time over which the sensor network’s surveillance duty is carried out. In order to conserve the valuable battery power of the wireless devices, a common trend is to put some of the sensor nodes into a dormant state, which is controlled by a sleep schedule [1]. For this we use ICTP adjustment scheme which is used to control the power of the sensor nodes.
In the research paper we use mutual information based sensor selection algorithm [2] which is used to select the sensors for detecting the target based on the information given by each sensor. A dual-space paradigm is presented in which the subset of nodes toward whom the target is approaching is selected to be active. We use this approach in our research paper so that number of sensors for detecting the target is reduced. Sensor nodes are selected based on the following characteristics such as sensor position, sensor modality and the predicted contribution of the sensor nodes. The information-driven approach balances the information gain provided by each sensor with the cost associated with acquiring the information. Dynamic scheduling approach is used so that sensors can collaborate among themselves.

2. Literature Survey

Clusters are formed dynamically around the high-capability sensor nodes in [3]. In this research paper we devise and evaluate a fully decentralized, light-weight, dynamic clustering algorithm for target tracking. Instead of assuming the same role for all the sensors, a sensor with high information about the target is selected as cluster head and the sensors with low capability must provide information to the cluster head based upon the request. Thus in research paper we use dynamic clustering method which effectively eliminates contention among sensors and give more accurate estimates of target locations. We use location-centric computing approach [4] in our research paper so that sensor collaboration among devices is in a certain area and not among an arbitrarily specified set of devices. This makes localized selective-activation strategies simple to implement.

Previous research [5] has focused on how to provide full or partial sensing coverage so that energy consumption is reduced. Nodes stay in a dormant state as long as their neighbors can provide sensing coverage for them. These solutions regard the sensing coverage of a certain geographic area as binary, i.e., coverage is either provided, or not. Here we have to place the target in such a way that number of sensors for detecting the target is reduced. For this we use sector coverage method so that number of sensors is reduced and there is no information loss while detecting the target. Due to the high energy consumption and the cost of the mobile sensor nodes, we assume that immobile sensor nodes are deployed in the surveillance area. Hostile and hard to access environments may make it necessary to deploy sensors randomly from an airplane [6].

3. Existing System

In Existing system we can detect only single target. Performance level for detecting the target is very low and we need many sensors for detecting the target. Here server directs which sensor to detect the target but target may move to some other location before it receives information from the sensor because target is a moving object. So accuracy
in detecting the target is very low. Providing coverage for target is very important. For that we use disk coverage method where the sensing area is disk centered around the sensor. In this coverage method we require many sensors for detecting the target. That’s simulation result shows that we need 4.64 times more sensors for tracking the target.

Actually each sensor has different sensing capacity and communication range. But we have to select the sensor with high capacity. For this we use information driven approach where the sensors are select based upon the information utility and cost. We have to select sensor based the sensor characteristic such as the sensor position, sensing modality and the predicted contribution of these sensors. But this method is cost effective.

In existing paper we use adaptable energy efficient sensing coverage protocol. In this protocol the energy distribution among the sensor nodes are unbalanced. This causes some nodes to die much faster than the other nodes. Here sensor which is not giving information about the target is not taken to the sleep mode so that large amount of energy is wasted. Since all the sensors take place in target tracking activity communication overhead may occur. We use static clustering approach where the entire sensor play same role in a particular cluster so that collision among sensors may occur. All these disadvantages are overcome in our research paper.

4. Proposed System
In proposed system we can detect multiple targets. Here sensor collaborate among themselves and they itself decide which sensors can be used to detect the target so that accuracy in detecting the target is improved. Here energy consumed and number of sensors required for detecting the target is very low. For this we require ICTP (information controlled transmission power adjustment) and MISS algorithm (mutual information based sensor selection). Here we use sector coverage method for locating the target so that there is no information loss because all the sensors are tightly bounded and we need less number of sensors for detecting the target. Here all the sensor nodes didn’t take part in the target detecting activity. Here first node with high information is selected and this node shares its information with its neighboring nodes. Then they decide among themselves that which sensor nodes can be participate in target tracking activity.

Another approach we use in our research paper is ICTP adjustment scheme which is used for energy consumption. Here the sensors which are used for detecting the target is kept in active state while other nodes are in sleep mode. The sensors which are in sleep mode come to active state automatically when they can detect the target. Thus by using this protocol there is 50% reduction in energy and 130% increase in the half life of the network.

5. Implementation
Modules needed for the proposed system are:

1. Networking Module.
3. ICTP Module.
4. Target tracking Module.
5. Average energy consumed module.

5.1 Modules Description

5.1.1 Networking Module

Client-server computing or networking is a distributed application architecture that partitions tasks or workloads between service providers (servers) and service requesters, called clients. Often clients and servers operate over a computer network on separate hardware. A server machine is a high-performance host that is running one or more server programs which share its resources with clients. A client also shares any of its resources; Clients therefore initiate communication sessions with servers which await (listen to) incoming requests.

5.1.2 Sensor selection module

The sensor selection problem only in terms of coverage and energy-saving aspects, without paying attention to detection quality. In tracking applications, when selecting the subset of sensor nodes to contribute to the global decision, we have to consider how informative the sensor nodes are about the state of the target.

5.1.3 ICTP Module

Information-controlled transmission power adjustment (ictp) adjustment scheme as the energy-saving strategy, in addition to the miss algorithm. the block diagram representation of the sensor node whose task is distributed target tracking with miss and ictp. sensory observation is transferred to the information extractor module to retrieve the information state and the information matrix denomination values from the received observation using module 5, which are then passed to the local information filter module where local target tracking takes place according to the operations

5.1.4 Target tracking Module

This module is used to track the target. Since target is a moving one so that in some cases we cant detect the target correctly because of the communication delay between the server and sensors. In order to avoid the communication delay sensors collaborate among themselves so that performance level in detecting the target is increased. For this we
require scheduling approach. Here priority is given to the every sensors. With this approach the communication delay between the sensors and target is decreased.

5.1.5 Average energy consumed module.

If we adjust the transmission powers of the sensor nodes according to pattern 3, on average, we achieve 2.14 times less energy usage with respect to the case in which no transmission power adjustment is made. However, power adjustment, on average, doubles the target localization errors as observed. The gain in terms of the exhausted communication energy does not compensate the increase in the target localization error. Hence, reducing the communication transmission power is not desirable.

6. System Design

In the above figure we consider client as the sensor node. First we have to locate the target and the sensors. Then server collects all the information about the target and the sensor nodes. Then server directs which sensor can detect the target. For this we require MISS algorithm. Then we have to reduce the power of the sensors. For this ICTP adjustment scheme is required. The information in the server should be updated continuously because target is a moving target. When target moves to some other area then the location of the sensor may also move. For this a new scheduling approach is used where sensors collaborate among themselves. Atlast energy consumed during detecting the target is calculated.

7. Conclusion

Thus in this research paper we proposed a new communication transmission power adjustment scheme to further reduce the energy needed for tracking the target. A mutual information based measure is adopted to select the most informative subset of sensor nodes to actively participate in the target tracking network. Thus by this using this approach two times less sensors are needed when comparing to other method. Then there is 50% reduction in energy consumption and 130% increase in half life of the network. Simulation result is in progress.
References


