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Reorganization of intruder Using Ad-Hoc Network And RFID

Vishakha Hagawane, Anukriti Anup Shrivastav, Kartiki Tambekar
Dept. of Electronic and Telecommunication Pune University
DPCOE Wagholi, Pune, India

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ABSTRACT

This system is to develop a centralized computer application that needs to identify moving person in a specific area using wireless network. In this paper, we develop a new indoor tracking algorithm using received signal strength. The RFID is able to detect the humans and provide information about the direction of the movement. The gathered information from the node is to be given to the base station for processing. This application is able to detect and track person, and report direction of the intruder to a central base station. In this system we design nodes through which we are able to track the person. The human intruder is detected using Zigbee.

Corresponding Author:

Anukriti Anup Shrivastav
Dept. of Electronic And Telecommunication Pune University
DPCOE Wagholi, Pune, India
Email: anukriti1910@gmail.com

1. INTRODUCTION

It is possible to locate people or other objects in an indoor environment without using expensive global positioning system (GPS) devices. GPS performance inside buildings is very limited due to impaired line of sight (LOS) to the GPS satellites [1-4]. A system-level approach to the problem of localizing and tracking a human user who assumed to be carrying a device for locating is considered in this paper. The device is module which consists of an RFID tag and Zigbee for tracking measurements.

A tracking system can be developed with moderate performance with a ZigBee mesh network that uses low-cost IEEE 802.15.4 embedded devices [5-6]. In Figure 1, we have a ZigBee mesh network where each device can communicate directly or through neighbor devices with other devices in the network. Connections between nodes are dynamically updated and optimized in difficult conditions. Mesh networks are decentralized where each node is self-routing and able to connect to other nodes as needed.

The purpose of Tracking for improving accuracy is to provide a better service for tracking people will be more useful for Security in known and unknown environments, Safety for a normal Human was being analyzed according to their pulse variations. This system can be used for tracking person and monitoring health of the person in an application/module; the additional features available in our system are monitoring pulse, SPO2, user access control, report generators and emergency situation alert.

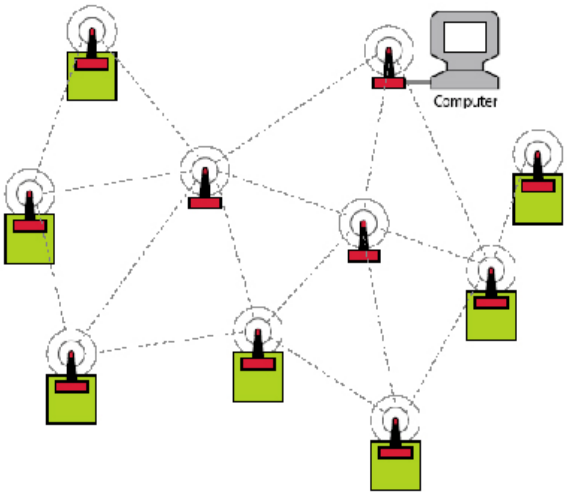

Figure 1. Zigbee Mesh Network

2. LITERATURE SURVEY

With the popularity of indoor location tracking systems the indoor positioning issue has emerged and it becomes a significant research topic. There are many different kinds of positioning technologies such as Global Positioning System, Wi-Fi positioning system and RFID Positioning System [1-2]. All these technologies have different coverage, applications and limitations. The nature of indoor positioning systems is somewhat different from that of outdoor positioning. Typically, the coverage of a positioning system is inversely proportional to the accuracy of detection. So, among these technologies, the most popular positioning system is GPS. It is a satellite based positioning system which is designed for outdoor environment; but, such satellite system lacks the capability in achieving high coverage and positioning precision in indoor environments [3-5]. The GPS signal is easily blocked by most construction materials and hence it becomes useless for indoor positioning. Thus, there is a problem of accuracy in a specific indoor area. For indoor environments, positioning systems that rely on existing network infrastructures such as Wi-Fi positioning system that provides location accuracies ranging from 1 to 10 m, depending mainly on the usage environment. The Wi-Fi network should exist as a part of the communication infrastructure, otherwise it will require expensive and time-consuming infrastructure deployment. Deriving an accurate propagation model for each Wi-Fi access point in a real-world indoor environment is extremely complex and therefore usually results in a relatively poor accuracy for positioning [6]. In indoor location detection, cost is another challenge in designing indoor positioning systems. Wi-Fi positioning system can be utilized in indoors, but its development and setup costs are very high when it covers a large area because it requires deployment of expensive Wi-Fi tags for tracking any object. Since the tags are relatively expensive, they need to be removed from tracked objects for reuse on objects to be tracked. If the objects to be tracked were changed more number of times, the operation cost of transferring tags for Wi-Fi positioning applications will be very high.

3. SYSTEM ARCHITECTURE

In this system we consider a infrastructure in which we deployed various nodes. Each node contains Zigbee module, and RFID Reader is used to locate the within the campus. The rfid tag will remain with the person. The moment the rfid tag will come within the range of the RFID reader the person can be locate easily according to the RSS received by each node

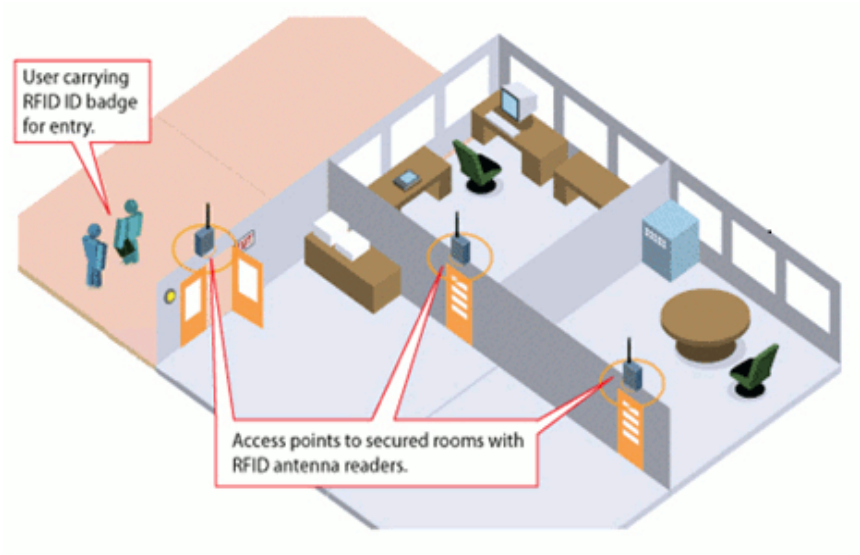

Figure 2. Node Deployed in infrastructure

Each node act as a transreciever it receive data from the rfid tag carried by person. Using RSS algorithm the highest RSS carried node will send information to the central station. Central station basically consist of receiver interfaced with the Pc i.e. computer. The data received by receiver is displayed on pc. On pc we have written a visual basic software window where we can observe and analyze the received data.

4. ALGORITHMS USED

For the first node the Algorithm is given below

1. start
2. initialize serial communication with baud rate 9600
3. initilize timer for 15 seconds
4. start counting pulses and spo2
5. Measurement finished
6. send pulse rate and spo2 and identification
7. go to step 3.

For the second and third node the Algorithm is given below

1. start
2. initialize serial communication with baud rate 9600
3. start scanning for data
4. if data received
5. check the RSSI value for the incoming data by sending command
6. get the RSSI value
7. send the data with the format decided.

Algorithm: Node 4

1. Start
2. initialize serial communication with baud rate 9600
3. continuosly scan for data reception
4. if data received check from which node
5. check the RSSI value of each node
6. find the max rssi value

5. TECHNOLOGY USED

We use ZigBee technology that has some important features that make it our best option to implement an mesh network, and low-power location monitoring system.

ZigBee technology's cost-effective features:

• Operating in 2.4 GHz unlicensed band or one of the sub-GHz regional bands
• Low complexity (low memory footprint)

• Low power (battery operated devices)
• Mesh networking (a feature not found in most wireless networking standards)
• Specifically designed to support sensing, monitoring and control applications

Table 1. the ZigBee technology

	ZigBee	Wi-Fi	Bluetooth
Range	10-100 meters	50-100 meters	10 – 100 meters
Networking Topology	Ad-hoc, peer to peer, star, or mesh	Point to hub	Ad-hoc, very small networks
Operating Frequency	868 MHz (Europe) 900-928 MHz (NA), 2.4 GHz (worldwide)	2.4 and 5 GHz	2.4 GHz
Security	128 AES plus application layer security		64 and 128 bit encryption
Typical Applications	Industrial control and monitoring, sensor networks, building automation, home control and automation, toys, games	Wireless LAN connectivity, broadband Internet access	Wireless connectivity between devices such as phones, PDA, laptops, headsets

In Table 1 you can see some of the ZigBee technology. Advantages over other wireless standards. Note that none of the others were designed to address monitoring

6. CONCLUSION

The goal of this paper is to develop an Zigbee-Based network to determine the location of person in a given network area and monitoring their health also. In short, enabled location monitoring using IEEE 802.15.4 technology can help make lives safer and healthier. Cost-effective ZigBee mesh networks that can provide effective location monitoring for a variety of environments and pulse rate sensor to monitor blood pressure and SPO2.

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