Smart Shopping Cart

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Abstract— Big shopping malls usually provide a directory to their available shops, but these directories are most of the time static and do not provide any interactivity features to the visitors. In this work, we present a mobile shopping mall navigator. System use RFID to store information about product. User can pay the bill by debit/credit card or online. The application developed is practical and feasible; Smart phones have become very popular these days, so we have combined the idea. Smart phone application helping user in an alienated mall. The idea revolves around smart phones & the "WI-FI" provided by the mall.

Keywords: Smart Shopping Cart, Radio-frequency identification (RFID)

I. INTRODUCTION

In traditional way of shopping where the customers choose their wished product and carry the products along with them. Then customer have to wait in long queues at the cash counter. This consumes lot of time and energy of both the shopper as well as cashier. To overcome this law, RFID tag is attached to product and RFID reader connected to trolley. Customer place product tag near to reader while making purchase, system retrieve essential details of all products from shops database and generate bill. This bill can be sent to the customer's mobile through online banking service thus the user can make quick payment and leave the shop early. The RFID tag of the product is read by the customer and move to the wish list if they are interested in choice of item by using the proposed mobile application. In order to develop an Android Application that uses a RFID reader for the purchasing and navigation of items for store that will be self-checking and automatic payment transaction. Here comes the term indoor navigation and RFID tag. Indoor positioning is still a challenging problem because satellite-based approach do not work properly inside buildings.

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically-stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source (such as a battery) and may operate hundreds of meters from the RFID reader. The tag need not be within the line of sight of the reader, so it may be embedded in the tracked object. RFID is one method for Automatic Identification and Data Capture (AIDC).

When user done shopping, user can pay the bill with card or online. For card payment user can pay the bill with credit card or debit card. User will provide the card details like name of bank, card number, CVV number, expiry date. Also provide the amount to pay. When user select online payment then user have to enter bank details like name of bank, account

II. LITERATURE SURVEY

A. Reliable Real-Time Indoor Positioning

This paper outlines the software navigation engine that was developed by SPIRIT Navigation for indoor positioning on commercial smartphones. A distinctive feature of our approach is concurrent use of multiple technologies for indoor positioning. Measurements from such smartphone sensors as Wi-Fi and BLE modules, together with the floor premises plan are used for hybrid indoor positioning in the navigation engine. Indoor navigation software uses such technologies as Wi-Fi and Bluetooth. Being blended in the particle filter, dissimilar measurements allow solving a set of principal tasks. First, the navigation engine can automatically start in any place of a building wherever user switches on his or her smartphone. There is no need to enter initial position manually or to start outdoors where initial position can be determined by GPS/GNSS receiver. Then, operating in the tracking mode, the navigation engine provides real-time indoor navigation for displaying current user position either on the floor plan or on Google Indoor Map if the latter is available for the building. At last, the navigation engine can recover tracking from failures that are the known problem of the particle filter occurring when all particles are accidentally discarded. The automatic recovery of tracking in this case allows continuing tracking and increasing availability of indoor navigation. The navigation engine exits in a form of SDK that serves for building mobile applications both for Android and iOS. Positioning results given for different indoor environments in a shopping mall and in a big exhibition hall show fast TTFF indoors and accurate and reliable real-time indoor positioning with accuracy of about 1-2 m.

B. Methods and Tools to Construct a Global Indoor Positioning System.

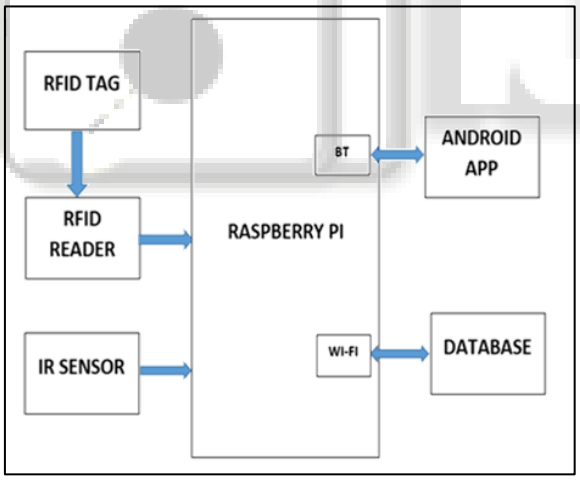
A global indoor positioning system (GIPS) is a system that provides positioning services in most buildings in villages and cities globally. Among the various indoor positioning techniques, WLAN-based location fingerprinting has attracted considerable attention because of the wide availability of WLAN and relatively high resolution of the fingerprint-based positioning techniques. This paper introduces methods and tools to construct a GIPS by using WLAN fingerprinting. An unsupervised learning-based method is adopted to construct radio maps using fingerprints collected via crowdsourcing, and a probabilistic indoor positioning algorithm is developed for the radio maps constructed with the crowd sourced fingerprints. Along with these techniques, collecting indoor and radio maps of buildings in villages and cities is essential for a GIPS. This paper aims to collect indoor and radio maps from volunteers who are interested in deploying indoor positioning systems for their buildings. The methods and tools for the volunteers are also described in the process of developing an indoor

positioning system within the larger GIPS. An experimental GIPS, named KAIST indoor locating system (KAILOS), was developed integrating the methods and tools. Then indoor navigation systems for a university campus and a large-scale indoor shopping mall were developed on KAILOS, revealing the effectiveness of KAILOS in developing indoor positioning systems. The more volunteers who participate in developing indoor positioning systems on KAILOS-like systems, the sooner GIPS will be realized.

C. Indoor Positioning of Wheeled Devices for Ambient Assisted Living: a Case Study.

Abstract - Indoor navigation is a well-known research topic whose relevance has been steadily growing in the last years thrust by considerable commercial interests as well as by the need for supporting and guiding users in large public environments, such as stations, airports or shopping malls. People with motion or cognitive impairments could perceive large crowded environments as intimidating. In such situations, a smart wheeled walker able to estimate its own position autonomously could be used to guide users safely towards a wanted destination. Two strong requirements for this kind of applications are: low deployment costs and the capability to work in large and crowded environments. The position tracking technique presented in this paper is based on an Extended Kalman Filter (EKF) and is analyzed through simulations in view of minimizing the amount of sensors and devices in the environment.

III. BLOCK DIAGRAM



IV. COMPONENTS OF SYSTEM

A. Raspberry-Pi

The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python.

B. RFID Tag

A radio frequency identification reader (RFID reader) is a device used to gather information from an RFID tag, which is used to track individual objects. RFID is a technology similar in theory to bar codes. However, the RFID tag does not have to be scanned directly, nor does it require line-of-sight to a reader. RFID tags contain an integrated circuit and antennas, which are used to transmit data to the RFID reader (also called an interrogator). The reader then converts the radio waves to a more usable form of data. Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves.

C. RFID Reader

These radio waves transmit data from the tag to a reader, which then transmits the information to an RFID computer program. RFID tags are frequently used for merchandise, but they can also be used to track vehicles, pets, and even patients with Alzheimer's disease. An RFID tag may also be called an RFID chip. Radio-frequency identification. Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. Unlike a barcode, the tag need not be within the line of sight of the reader, so it may be embedded in the tracked object.

Advantages of RFID. RFID technology automates data collection and vastly reduces human effort and error. RFID supports tag reading with no line-of-sight or item-by-item scans required. RFID readers can read multiple RFID tags simultaneously, offering increases in efficiency.

D. IR Sensor

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measure only infrared radiation, rather than emitting it that is called a passive IR sensor. Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation. These types of radiations are invisible to our eyes that can be detected by an infrared sensor. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode that is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, the resistances and the output voltages will change in proportion to the magnitude of the IR light received.

V. APPLICATIONS

A. Shopping Malls

Shopping malls now days have become too much crowded which results in so much of time consumption of customers from their busy life schedule. Smart Shopping Cart will reduce payment complexity, products location navigation become easier, bill generation becomes easier and hence crowd can be reduced without even affecting the sale of the store.

B. Big Medical Stores

Long queue on medical stores can cause failure in treatment which can cost life of patient. Here Smart Shopping Cart can reduce medicine location searching problem and quick payment by the customer and hence will reduce the queue from the store which will result in quick treatment.

C. Big Jewelry Shops

Jewelry shops are very popular and are much liked by both men and women. These shops face very much crowd in marriage season and people on that time short on time due to other management issues. Hence this technology will definitely help consumers in their time saving and choosing their desired product easily.

VI. CONCLUSION

In a step aimed at promoting shopping methods and make people life easier; we are going to build this project that could play an important role in Indian society as a whole. The usage of Pocket mall navigator as a shopping mall navigator, in addition to helping the users to find products efficiently and effectively, were able to create awareness in using smart mobile devices for flexibility in almost every task among the shopping.

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