

A Survey on Bus Location Tracking and Display Using RFID

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ABSTRACT

In present time due to increase in number of kidnapping and road accident cases, parents always worry about their children. This paper proposed the RFID based Bus detection system to help people in travelling from one place to another. Generally, journey in a bus is a safe and comfort zone but navigation in outdoor environments is highly difficult for those who have ingrained blindness or blindness from a very young age. Therefore, this paper plans to develop a bus detection prototype using Radio Frequency Identification (RFID) . Interfacing reader with microcontroller (ATMEGA328-PU), using wifi module for wireless communication design aids in improved navigation.

Keywords : RFID, Bus Detection, RFID Reader

I. INTRODUCTION

Bus Detection plays an essential role in carrying most of children everyday all over the world. While there are several problems that might disturb the parents with respect to the travel of school going kids; the paper aspires to look into initiating the safety with respect to school buses through bus tracking and security system that will help the school kids' transportation in a protected and more secure way. The circumstance of forgetting kids on the buses one of the problems suffered, that has risen considerably in recent years. This has often led to the demise of many students due to suffocation.

An article [1] published in India says in every eight minutes a child goes missing as data published by national crime records bureau. This system, through entry and exit recordings, intends to create an appropriate environment via following certain set of criteria of security and wellbeing for the school transport that will have a positive impact on the student and their family. Also drunk and driving is a major factor for road accidents. Recently an article [2] was published in The Indian Express newspaper titled "Five children injured after drunk driver rams school bus into

railing of bridge ".The driver of the bus was drunk. Police booked him for negligent driving. This shows that even school bus is not safe from the drunken drivers. Thinking of this, the system is also equipped with alcohol sensor which is integrated on the steering wheel and will sense the percentage of alcohol in the air. If the concentration of alcohol in air is found above some prescribed limit; then the ignition is cut off and the driver will not be able to drive the bus thus keeping the students safe Road accidents are rising day by day. Major parts of these mishaps occur due to rash driving or over speeding of the vehicle. The speed control mechanism will help in limiting the speed of the bus. The system is designed using single microcontroller which will reduce the hardware size and so the cost.

II. METHODS AND MATERIAL

Proposed Work

This paper outlines implementation of RFID for a bus detection mechanism to help people in travelling from one place to another. Generally, journey in a bus is a safe and comfort zone but navigation in outdoor environments is highly difficult for those who have ingrained blindness or blindness from a very young age.

Therefore, this paper aims to develop a bus detection prototype using Radio Frequency Identification (RFID) for bus detection. Interfacing reader with microcontroller (ATMEGA328-PU), using wifi module for wireless communication design aids in improved navigation.

III. RESULTS AND DISCUSSION

RF-based Gesture Recognition

Recently, RF-based gesture recognition systems have attracted intensive research interest. Most of them are based on WiFi or RFID, owing to the shared merits of non-intrusiveness and pervasiveness. The examples of WiFi-based gesture recognition they succeed in distinguishing various kinds of gestures at the cost of sophisticated system implementation, and/or specialized and modified hardware, which leverages Channel State Information (CSI) and signal phase as metrics to distinguish fine-grained gestures.

However, the system works in a relatively short range (within 80 cm) and is highly position-dependent because of the utilization of directional antennas. RFID is an alternative promising technology for gesture recognition. For example, Allsee [5] leverages RFID backscatter signals to recognize signals. However, the tag used by Allsee should be connected to a logical computation unit which is unavailable on most low-cost commodity tags. Authors in leverage the gestures recognized by RFID readers to identify a pair of RFID toys, yet requiring much computational processing. RF-IDraw, Tagoram and Tagball can trace a tag's spatial trajectory at a granularity of centimeters, while they all require attaching a tags to the tracked object. Consequently, our work is different from all those above in that we concentrate on building up a device-free gesture recognition system with RFID phase information, which owns the capability of capturing the diverse features of gestures for distinction. RFID-based Indoor Localization. There have been a large amount of researches on RFID-based indoor localization. LANDMARC is a pioneering positioning system relying on RFID with RSSI which suffers from severe multipath problems in indoor

environments. PinIt resolves both multipath and NLOS by employing adaptive dynamic time warping technique. VIRE [6] introduces the concept of virtual tags to improve precision as well as reduce deployment cost. Our design is inspired by the most recent work that utilizes phase value of the backscattered signal to built a virtual antenna array for real-time localization. Instead of acquiring the absolute location like the above systems, GRfid aims to detect and identify the more subtle gestures.

YongpanZou [7] propose GRfid, a novel device-free gesture recognition system based on phase information output by COTS RFID devices. Our work stems from the key understanding that the RFID phase information is capable of capturing the spatial features of various gestures with low-cost commodity hardware. In GRfid, after datas are collected by hardware, we process that data by a sequence of functional blocks, namely data preprocessing, gesture detection, profiles training and gesture recognition, all of which are well-designed to achieve high performance in gesture recognition. Author have implemented GRfid with a commercial RFID reader and multiple tags, and conducted extensive experiments in different scenarios to evaluate its performance. The results demonstrate that GRfid can achieve an average recognition accuracy of 96.5% and 92.8% in the identical-position and diverse-positions scenario, respectively

DiGiampaolo [8] proposed a Advantages of method include faster detection speed and simpler implementation compared to other existing diagnostic methods in the literature. Moreover, this diagnostic method is exempt to the disturbances of inverter's dc-bus voltage unbalance and load unbalance. In this method, one additional current sensor is required for measuring the dc-bus neutral-point current, therefore the implementation cost is low.

Emidio [9] show a semi-passive wireless strain gauge sensor, which allows a high level of measurement accuracy comparable with that of wired strain sensors. It conquered the limits and drawbacks of devices based on wireless sensor networks and those based on similar

RFID-based sensors. The ability to perform measurements over long distances and to handle fast time-varying phenomena (e.g., vibration) makes the proposed device practical in realistic scenarios.

Wang [10] present a novel wearable Radio Frequency Identification (RFID) system aims at providing an easy-to-use solution with high detection coverage. Our system uses passive tags which are maintenance-free and can be embedded into the clothes to reduce the wearing and maintenance efforts. A small RFID reader is also worn on the user's body to expand the detection coverage as the user moves. We exploit RFID radio patterns and extract both spatial and temporal features to characterize various activities. We also address the negative issues of tag readings and tag/antenna calibration, and develop a fast online realization system. Antenna and tag selection is done automatically to examine the minimum number of devices required to achieve target accuracy. We develop a model system which consists of a wearable RFID system and a smartphone to demonstrate the working principles, and conduct experimental studies with four subjects over two weeks.

Shah, Shraddha [11] recommends a SMS based solution which assists parents to track their children location in real time. To track the location GPS module is used and to identify the child, a RFID card is used which is in built in the system. Whenever a child boards a bus, the RFID tag located in his identity card will be detected by the reader present in the bus and the system will identify the child and will send a text message to the parents consisting the current location and time. In this way the parents will be able to keep record of their kid's whereabouts. The paper also proposes security system such as drunk and drive prevention system and speed control mechanism.

KhaleedShaban in his paper titled [12] "Smart Tracking System for School Buses Using Passive RFID Technology to Enhance Child Safety" adopted RFID Technology to safeguard the children from wrong recognition of their destination location, method to curtail the students sleeping in the bus its self without leaving to classes. This paper also concentrate to provide the security to the children from starting location to the destination point with applied RFID technology. This seems to be a good solution for keeping a track of the child; but it lacked with some of the security mechanisms that should have been included like speed control mechanism, fire safety and prevention of drunken people to drive the school bus.

Paper [13], presents a system using biometric features for e.g. the school children track biometric system, while entering into the bus pupils scan their palms across a palm reader. To replicate the palm's specific pattern, palm reader uses IR light. For cross-verification the results of scanned palms are sent against original patterns stored insecure database. The inconvenience is that it is manual and small kids feels difficult to place their palms correctly on the scanner.

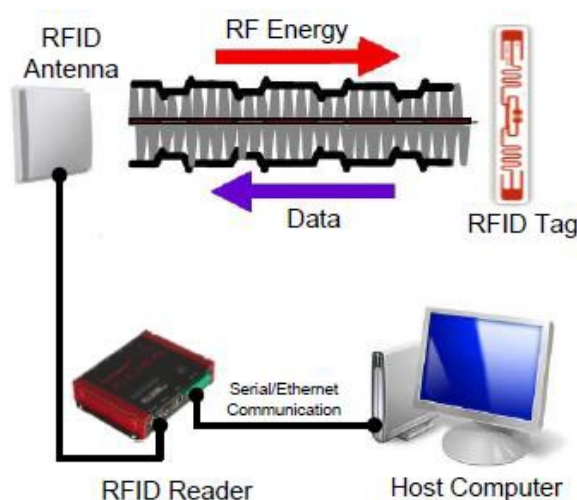


Figure 1. Working of RFID Technology

TABLE I

S.No	Paper Title	Methodology	Benefits	Limitation	Ref
1	Bus detection device for the	auditory touched clues, Sonicguide, the Mowat	This approach helps the blind to identify the bus effectively.	Performance is poor due to	14

	blind using RFID application	sensor, the Laser cane and the Navbelt	information such as bus route, final destination and bus number are also provided	system functionality and cost	
2	RFID based school bus tracking and security system	SMS based solution, location GPS module	proposes security system such as drunk and drive prevention system and speed control mechanism	Problem in location tracking	15
3	Performance analysis of speed detection in Bus Detection Devices (BDD)	Bus Detection Devices (BDD) and RFID technology	improve the quality of speed detection and validation method	Find only appropriate speed of bus for optimum detection at the bus stop	16
4	The studies on Horizontal Coverage Pattern (HCP) for Bus Detection Devices (BDD)	Horizontal Coverage Pattern (HCP) for Bus Detection Devices (BDD), RFID reader, UHF passive tags	improve the functionality of the device	Performance is low in coverage area covered by different type of UHF passive tags	17
5	Text detection in bus panel for visually impaired people "seeing" bus route number	proposed method includes moving bus detection, bus panel detection, and text detection to detect the moving bus	100% text detection rate for the training and testing video.	Time complexity has to reduce.	18
6	Exploiting domain constraints for exemplar based bus detection for traffic scheduling	visual recognition technology (HOG SVM)	show results on challenging data from traffic cameras under different observation conditions and at varying ranges	Poor accuracy in different observation condition.	19
	Detection of weak bus through Fast Voltage Stability index and inherent structural characteristics of power system	Fast Voltage Stability index (FVSI)	weak bus is better detected through the concept of inherent structural characteristics of power network	does not involve performing the time consuming traditional load flow	20

IV. CONCLUSION

This paper proposed a RFID based bus detection system which checks the bus availability check, short route selection, ticket reservation system, develop android app

for monitoring to help people in travelling from one place to another. Generally, journey in a bus is a safe and comfort zone but navigation in outdoor environments is highly difficult for those who have ingrained blindness or blindness from a very young age.

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