



Real Time Urban Bus Navigation and Accident Detection Based on GPS-GSM

Santhiya.K¹, Vasanthi.G²

P.G. student, Communication Systems (ECE), Idhaya Engineering College for women, Chinnasalem, Tamilnadu, India¹
Assistant Professor, Department of Electronics and Communication Engineering, Idhaya Engineering College for
women, Chinnasalem, Tamilnadu, India²

ABSTRACT: A public traffic system mainly depends on driver's manual operation, which will inevitably encounter many problems such as punctuality of the bus's arrival on bus station. The main problem in the current scenario is the tracking of an organization buses while moving on a highway is a crucial task. A person patiently waiting for the bus may need to enquire about the position of current location of the bus. Mobile phones based bus tracking system provides a solution to this problem which helps anyone to know the location of the bus without calling or disturbing the person travelling in that bus. It also consists of accident detection system in which the vibration sensor has been used in order to detect the occurrence of the accident and once if the accidents occur then the message will be given to the system. It will track the location of the bus where it met with accident and immediately delivers the message about the accident to the emergency services such as ambulance and concerned people without time delay. System based on GPS and GSM technology, to improve the operation efficiency of bus monitoring system and realizes intelligent transportation system. The UBN system based on GPS and GSM technology for real time bus navigation, arrival time prediction and accident detection.

KEYWORDS: PIC microcontroller, Gsm, Gps, Vibrator sensor, Smartphone.

I.INTRODUCTION

As cities continue to grow in size and population, new challenges arise for the design of urban mobility infrastructures. While public bus transport systems have the capacity to absorb large masses of urban travelers, their public image often suffers from a negative perception. First, from a Passenger's point of view, bus networks in dense urban areas are often considered as complex and difficult to navigate. Second, in contrast to private modes of transport, travelling on buses offers only a low level of comfort and convenience. Third, bus journeys lack a sense of personal control and ownership that is valued by car users. To overcome these inherent weaknesses of the physical bus transport system, researchers increasingly turn their attention to digital technologies in order to improve the perceived quality of bus transport. In these urban life transportations is very common. A lot of mishappenings occur on the road every day. Therefore the need of security and monitoring is developed. To resolve such problems, a system is developed using GPS and GSM technologies. The various problems that we face in day to day life are, Standing for bus on the respective bus stops without knowing the arrival and departure time of the bus, for respective stops accurately and also buses available for in that route. If any accident happens the affected people have to wait for period of time to receive the emergency helps from the accident occurred. The sudden stopping of the bus due to the scarcity of the fuel in the fuel tank. This proposed system developed for overcome and resolve the above faults. The system introduced in this paper was specially designed for Educational Institutions buses. To fill this gap the UBN system based on GPS and GSM technology for real time bus navigation, arrival time prediction and accident detection.

EXISTING SYSTEM

A key challenge for rapidly growing cities of today is to provide effective public transport services to satisfy the increasing demands for urban mobility.

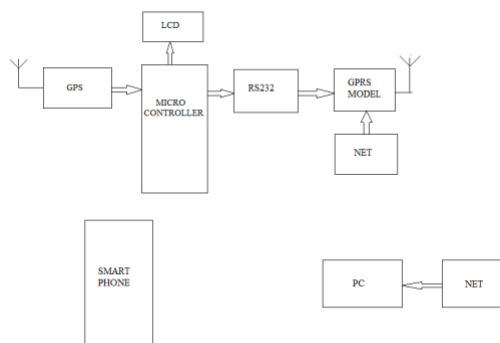


International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijareeie.com

Vol. 6, Issue 3, March 2017



Existing system block diagram

Towards this goal, the Internet of Things has great potential to overcome existing deficiencies of public transport systems given its ability to embed smart technology into real-life urban contexts.

II.RELATED WORK

A key challenge for rapidly growing cities of today is to provide effective public transport services to satisfy the increasing demands for urban mobility. Towards this goal, the Internet of Things has great potential to overcome existing deficiencies of public transport systems given its ability to embed smart technology into real-life urban contexts. In this paper, we show how this paradigm can be applied to the public transport domain and present the Urban Bus Navigator, an Internet-of-Things enabled navigation system for urban bus riders. UBN provides two novel information services for bus users: 1) micronavigation and 2) crowd-aware route recommendation. Micronavigation refers to fine-grained contextual guidance of passengers along a bus journey by recognizing boarded bus vehicles and tracking the passenger's journey progress. Crowd-aware route recommendation collects and predicts crowd levels on bus journeys to suggest better and less crowded routes to bus riders. We present the technical system behind the Urban Bus Navigator and report on results from an in-the-wild study in Madrid that indicates removed barriers for public transport usage and a positive impact on how people feel about bus journeys.

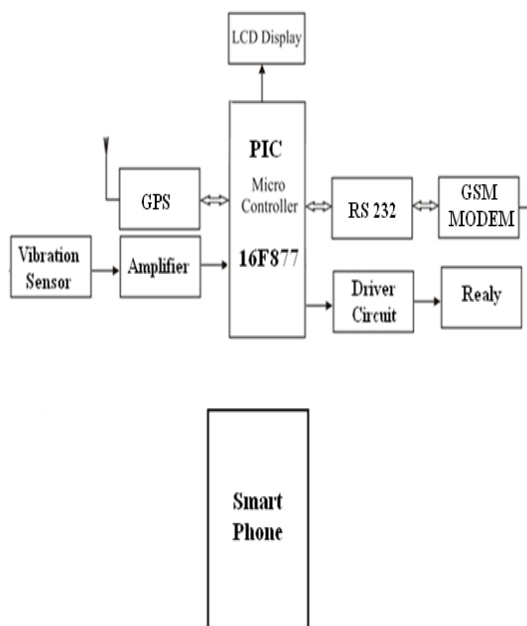
III.PROPOSED SYSTEM DESIGN

The proposed system implements the direct communication between user and bus using GSM. There is no need for wifi -communication .The server is no need to store the navigating bus information. It consists of two units one is transmitting side (vehicle unit) and other one is monitoring side.

URBAN BUS NAVIGATION SYSTEM

Most public transport journey planning tools for Smartphones are context-aware and use the current time and the user's location (determined via GPS or Wifi localization) to retrieve relevant information. However time and location are coarse-grained indicators that only support macro-navigation decisions ("What is the next bus from my current location"). Supporting micronavigation tasks requires a fine-grained contextual, semantic understanding of the passenger's transport situations which can be achieved by enabling the passenger's Smartphones to actively detect and recognize the nearby urban bus infrastructure. UBN is a novel context-aware navigation system for urban bus passengers with support for macro- and micro-navigation. In the remainder of this section we will outline the UBN system architecture and describe the key innovative system functions for micro-navigation.

BLOCK DIAGRAM



TRANSMITTER SECTION

The proposed system consists of PIC16F877A, Power supply, Vibration sensor, LCD, GSM Modem and GPS. The user must carry an android phone with them in order to know the status of the bus such as location of bus, its arrival time, departure time, the bus able for the particular route etc., The vibration sensor in the bus is used to detect occurrence of any accident and once if accident occurs then the signal will be given to the microcontroller and the microcontroller will send the message to the concerned emergency services through the GSM Modem and the GPS is used to track the location such as latitude and longitude where the accident had been taken place.

GPS

GPS modules are popularly used for navigation, positioning, time and other purposes. GPS antenna receives the location values from the satellites. GPS gives information about:

- Message transmission time
- Position at that time

GSM

GSM modem is used for transmitting and receiving the data. SIM 300 is a tri- band GSM/GPRS engine. It works on various frequencies i.e. EGSM 900MHz, DCS 1800MHz and PCS 1900MHz.

MICROCONTROLLER

The system uses a CMOS 8- bit microcontroller. It is based on RISC architecture. It comprises of 16k bytes of flash program memory, 1K byte internal SRAM and 512 bytes EEPROM.

MAX 232

Max 232 is used for GSM, GPS and microcontroller to communicate serially.

16X2 LCD

A 16x2 LCD is used for displaying location values. A 9v battery is used to power up the circuit.

VIBRATION SENSOR

The vibration sensor are used to sense any accident occurrence once if any signal is send to microcontroller then the microcontroller will send the location of the accident spot to the emergency services by getting the GPS value using GPS modem via message through GSM modem.

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijareeie.com
Vol. 6, Issue 3, March 2017

RECEIVER SECTION

The android mobile application is the receiver section of our entire system. This application makes our proposed system much more efficient than the already developed systems. With this application, the smart phone users can see the track position of the bus with internet connection. This system has Global Positioning System (GPS) which will receive the co-ordinates from the satellites among other critical information. The system is microcontroller based that consists of a GPS and GSM along with the interfacing of all other sensing units which are all located in various places in that bus. The system is not limited to find the location of the target but also calculates the distance travelled between two stops and all other sensing functions through the smart phones.

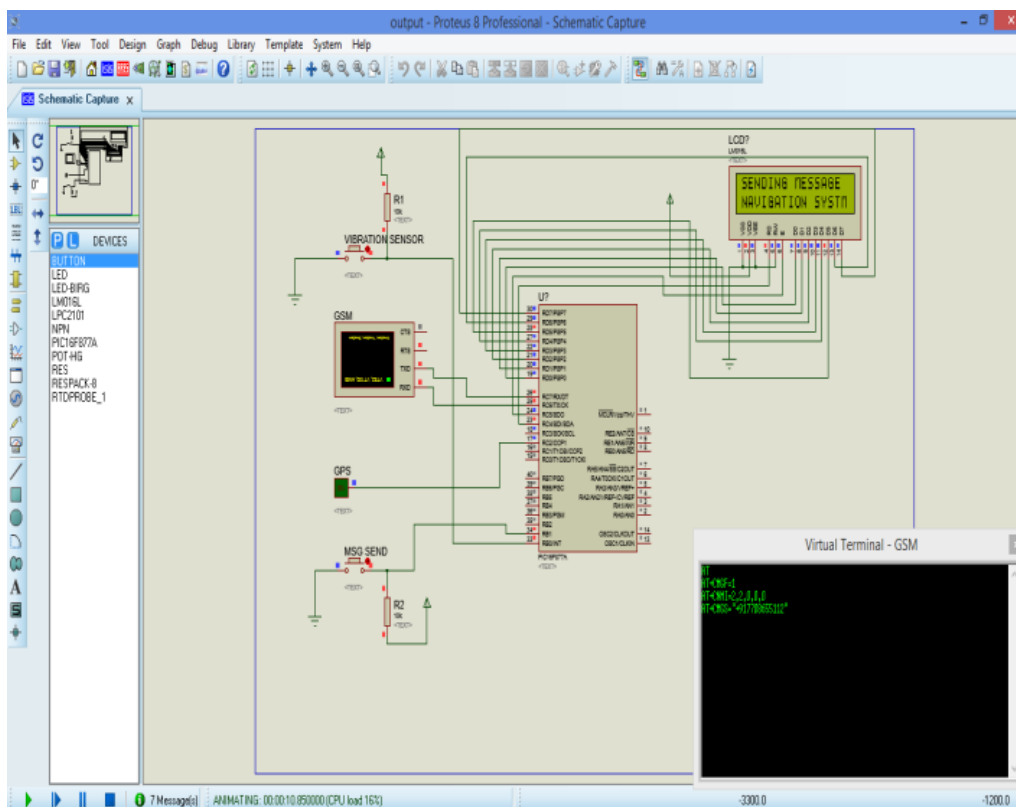
IV.RESULT AND DISCUSSION

The position, arrival time and departure time of the bus are exactly known. The intimations regarding accidents are sent to the emergency services and concerned people with location of the accident are implemented in software and then implemented on hardware.

SOFTWARE IMPLEMENTATION

INPUT IMAGE: BUS NEAR STOP LOCATION

If the bus reach the near stop the location automatically the location information send to the user mobile phone.

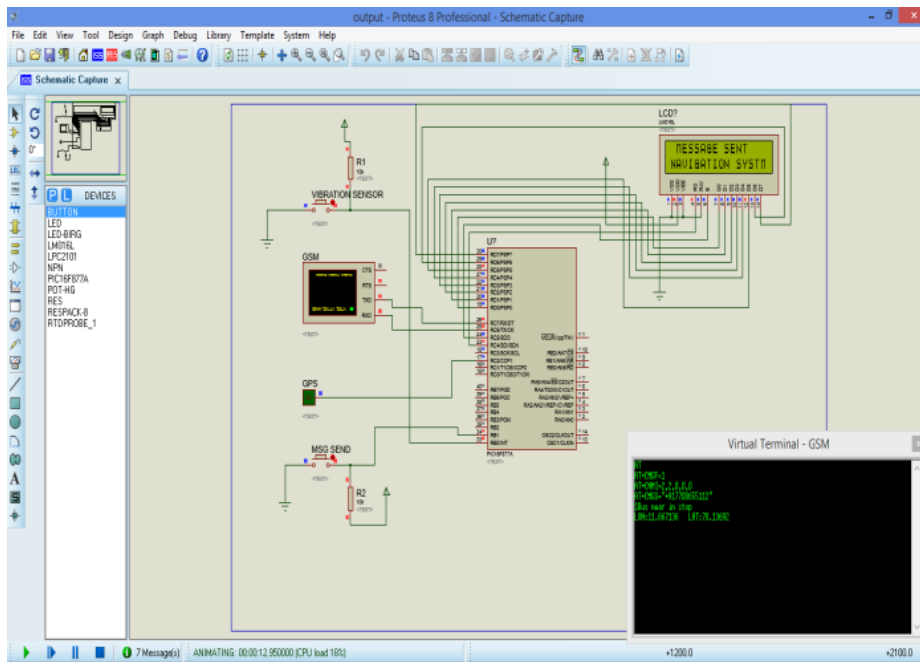


International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

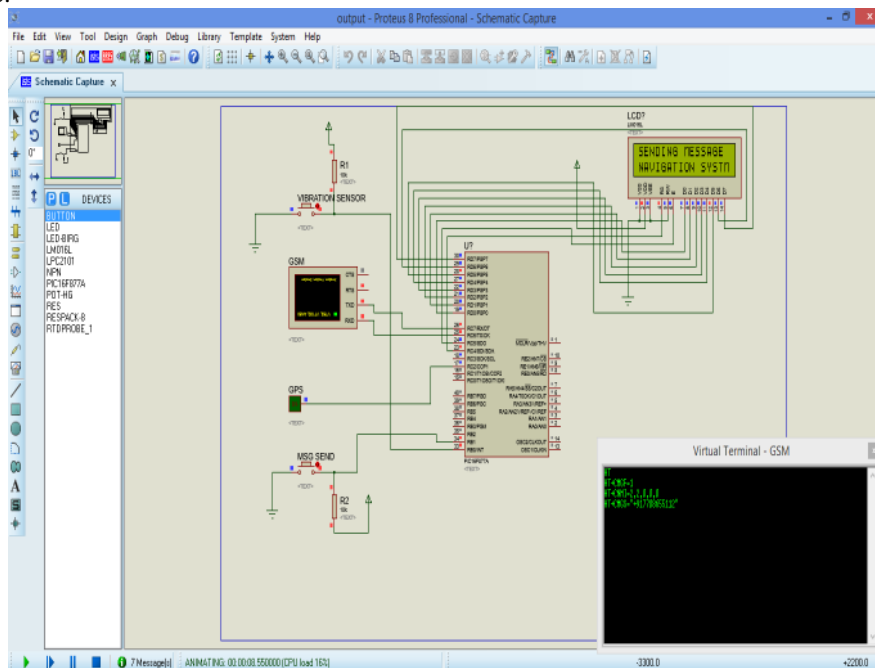
(An ISO 3297: 2007 Certified Organization)

Website: www.ijareeie.com
Vol. 6, Issue 3, March 2017

OUTPUT IMAGE: BUS NEAR STOP LOCATION
The mobile user get the bus near stop location from UBN system.



INPUT IMAGE: ACCIDENT LOCATION
If any accident occur the location of the accident information send to the relevant bus owner and emergency service such as ambulance.



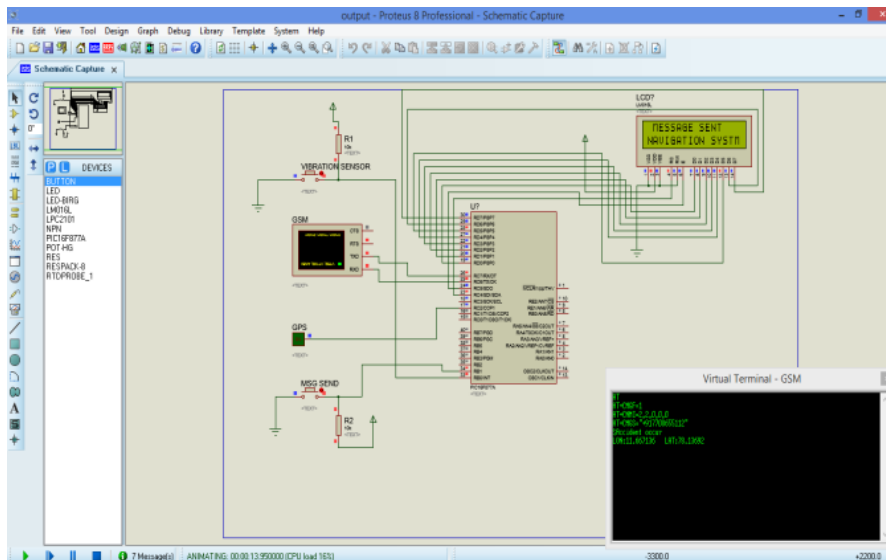
International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(An ISO 3297: 2007 Certified Organization)

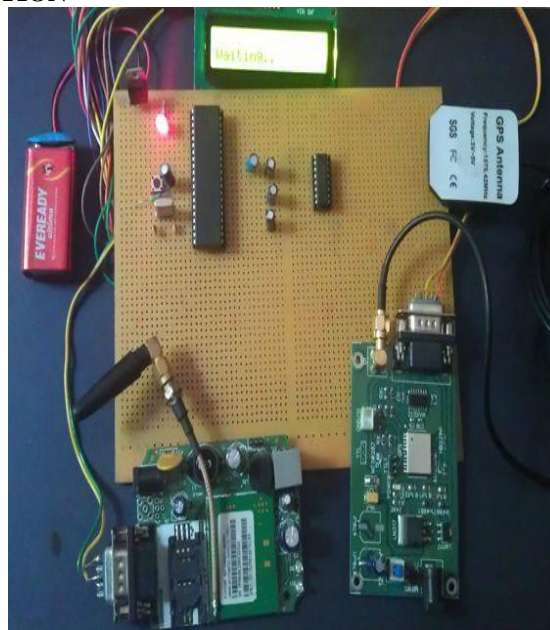
Website: www.ijareeie.com
Vol. 6, Issue 3, March 2017

OUTPUT IMAGE: ACCIDENT LOCATION

The mobile phone user and relevant bus owner get the accident location information from UBN system.



HARDWARE IMPLEMENTATION



V.CONCLUSION

In this paper we have presented the Urban Bus Navigator, a navigation system for bus passengers that has the ability to seamlessly interconnect bus passengers with the real-world public bus infrastructure. This research provides passengers with information such as exact location of the bus and approximate arrival time of the bus. The advantage of the proposed system is that it provides real time updated information, reduce passengers waiting time, usage of android phones enables ease of usage and is user friendly and also the system has easy implementation and



ISSN (Print) : 2320 – 3765
ISSN (Online): 2278 – 8875

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijareeie.com

Vol. 6, Issue 3, March 2017

low maintenance cost.. The Urban Bus navigation system provides the Real time bus navigation, arrival time prediction and accident detection.

REFERENCES

- [1]. Prof. Devidas S. Thosar, Rishikesh K. Zade, Onkar V. B. Abrekar, Priyanka R. Chaudhari, "Bus Tracking and Bus Failure Detection Systems Using GPS" International Research Journal of Engineering and Technology Vol.2, Issue.7, October 2015.
- [2]. Pratiksha R. Shetgaonkar, Vijakumar Naik Pawar, Rajesh Gauns "Proposed Model for the Smart Accident Detection System for Smart Vehicles Using Arduino board, Smart Sensors, GPS and GSM" International Journal of Emerging Trends & Technology in Computer Science Vol.4, Issue.4, July-August 2015.
- [3]. Shita M. Dharrao, Vijay D. Choudhary, Kantilal P. Rane "Intelligent Bus Stand Monitoring and Control Using Combination of GSM, GPS & IR Sensors" International Journal of Innovative Research in Science Engineering and Technology Vol. 4, Issue 7, July 2015.
- [4]. Vigneshwaran K. Sumithra S. "An Intelligent Tracking System Based on GSM and GPS Using Smartphones" International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering Vol.4, Issue.5, May 2015.
- [5]. Ankita Pendole, Ajay Shingare "GPS Supported City Bus Tracking & Smart Ticketing System" 978-1-4673-7910-6/04 2015 IEEE
- [6]. Avinash Kumar A. Singaravelan U. Premkumar T.V. Gnanaprakash K "Digital Fuel Level Indicator in Two-Wheeler Along with Distance to Zero Indicator" IOSR Journal of Mechanical and Civil Engineering Vol.11, Issue.2, May-April 2014.
- [7]. Rose marries John, Finky Francis, Joe Neelankavil "Smart Public Transport System" International Conference on Embedded Systems 2014, and 978-1-4799-5026-3/14 2014 IEEE.
- [8]. Nimmy James, Aparna C, Teena P John "Alcohol Detection System" International Journal of Research in Computer and Communication Technology Vol.3, Issue.1, January 2014.
- [9]. Pankaj Verma, J.S Bhatia "Design and Development of GPS-GSM Based Tracking System with Google Map Based Monitoring" International Journal of Computer Science Engineering and Applications Vol.3, No.3, June 2013.
- [10]. K.P. Kamble, "Smart Vehicle Tracking System" International Journal of Distributed and Parallel Systems Vol.3, No.4, July 2012.