

Intelligent Traffic Management System Using Iot

M. Ravi Kishore

Department of Computer Science and Engineering, Anurag Group of Institutions, India

ravikishorecse@cvsr.ac.in

Mr. K. Pravallika

Department of Computer Science and Engineering, Anurag Group of Institutions, India

kotapravallikareddy@gmail.com

Ms. M. Samyuktha

Department of Computer Science and Engineering, Anurag Group of Institutions, India

samyuktha.maddikunta24@gmail.com

Mr. V. Pranay

Department of Computer Science and Engineering, Anurag Group of Institutions, India

vattepranay1998@gmail.com

ABSTRACT

All metropolitan cities face traffic congestion problems especially in the downtown areas. Normal cities can be transformed into “smart cities” by exploiting the information and communication technologies (ICT). The paradigm of the Internet of Things(IOT) can play an important role in the realization of smart cities. This abstract proposes an IOT based traffic management solution provides a smooth flow for the ambulance to reach the hospitals in time and thus minifying the expiration. The idea behind the scheme is to implement an ITS which would control mechanically the traffic lights in the path of the ambulance. The ambulance is controlled by the central unit which furnishes the most scant route to the ambulance and also controls the traffic light according to the ambulance location and thus reaching the hospital safely. Traffic signal shows green light to the ambulance path.

Keywords- *Traffic Management System, traffic lights, Ambulance, IOT.*

1. INTRODUCTION

The population of the world has been increasing, with China and India being the two most densely populated countries. Road traffic has also been getting more and more congested, as a higher population and increased business activities result in greater demand for cars and vehicles for transportation. This increased vehicle density leads to many road accidents. In road accidents due to lack of emergency service people lose their lives. The main aim of this project is a scheme to detect accidents, find accident locations and provide a smooth flow for ambulances to reach hospital in time of emergency. In the proposed system the unit installed in vehicles automatically informs accidents to the pre-programmed numbers of rescue teams of ambulances. In this system vibration sensor and GPS tracking systems are used for accident detection. When an accident occurs, this system sends a short message to the rescue team in the ambulance via GSM modem. Messages will give longitude and latitude values. From these location coordinates accidents can be determined. So the rescue team in the ambulance can immediately trace the location by putting geographical location coordinates in Google

earth application or any other GPS viewer application. After confirming the location of the accident spot the ambulance unit will start its rescue operation. If the person meets with a small accident or if there is no serious threat to anyone's life, then the alert message can be terminated by the driver by a switch provided in order to avoid wasting the valuable time of the medical rescue team.

2. EXPERIMENTAL

The vehicle unit consists of a vibration sensor, Arduino, a user interface, GPS system and a GSM module. The vibration sensor used in the vehicle will continuously sense for any large scale vibration in the vehicle. The GPS SYSTEM finds out the current position of the vehicle (latitude and the longitude) which is the location of the accident spot and gives that data to the GSM. The GSM sends this data to the control unit whose GSM number is already there in the module as an emergency number. The message sent by the vehicle unit is received by the ambulance unit. The rescue team in the ambulance immediately traces the location by putting geographical location coordinates in GPS viewer application. After confirming the location of the accident spot the ambulance unit will start its rescue operation. At the same time, the ambulance unit turns ON the RF transmitter. This will lead to communication with the traffic section. Whenever the traffic signal section receives the information about an accident, the RF receiver in this Section is turned ON to search for an ambulance near the traffic signal. Whenever the ambulance reaches near to the traffic signal (approximately 100m), the traffic signal will be made to green through RF communication. So, the components are as shown in the table(1)

HARDWARE MODULE	SPECIFICATIONS	ITEMS
Arduino Uno	14 I/O pins, 6 analog inputs, 16MHZ quartz crystal	USB connection, power jacks, ICSP header, Rest button
MEMS Sensor	25.4 x 18.4 mm	Pressure sensors
GSM Modem	900 MHZ	Applications are voice calls, SMS, GSM data calls, GPRS
GPS Module	28 operational satellites orbiting the Earth at a height of 20,180 km on 6 different orbital planes	Space segment, User segment, control segment
RF Module	10KHz to 300GHz radio frequency	Transmitter, Receiver
LCD Display	80.0 x 36.0 mm and VA size of 66.0 x 16.0 mm	Laptop Screens

Table(1)

3.RESULTS AND DESCRIPTION

In our project we are designing such type of device which help to monitor the traffic issues and starting with what is needed, design takes us toward how to satisfy the needs. In the *figure(1)*; we have discussed about the purpose of the design phase is to plan a solution of the problem specified by the requirement document. This phase is the first step in moving from the problem domain to the solution domain. In other words, starting with what is needed, design takes us toward how to satisfy the needs. The design of a system is perhaps the most critical factor affecting the quality of the software; it has a major impact on the later phase, particularly testing, maintenance. The output of this phase is the design document. This document is similar to a blueprint for the solution and is used later during implementation, testing and maintenance. The design activity is often divided into two separate phases System Design and Detailed Design.

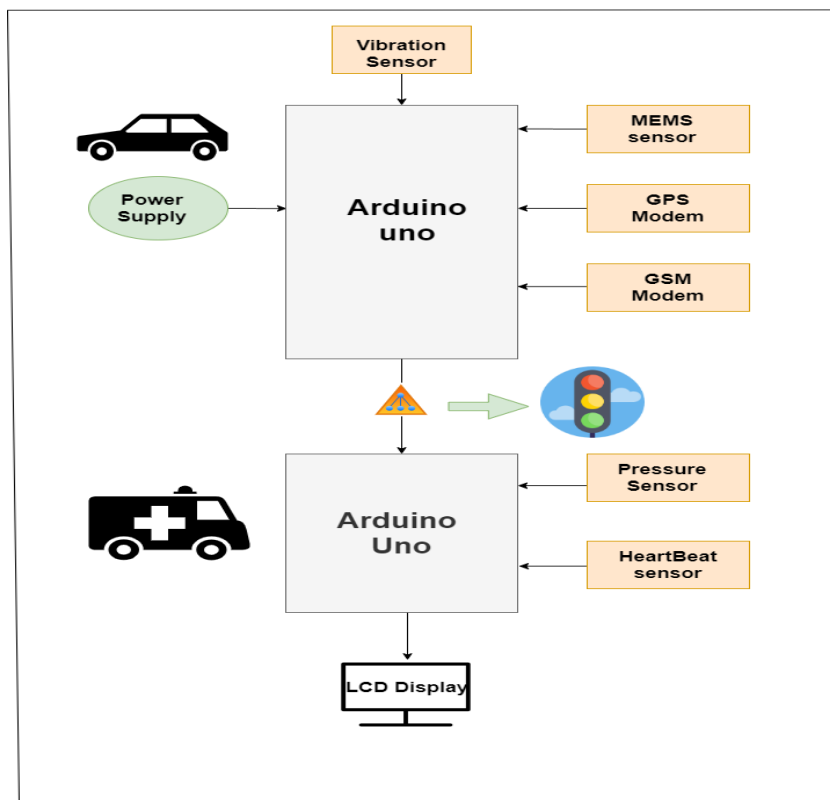


Figure (1) : Architecture Diagram

GSM provides recommendations, not requirements. The GSM specifications define the functions and interface requirements in detail but do not address the hardware. The reason for this is to limit the designers as little as possible but still to make it possible for the operators to buy equipment from different suppliers. The GSM network is divided into three major systems: the switching system (SS), the base station system (BSS), and the operation and support system (OSS). The basic GSM network elements are shown in below *figure(2)*;

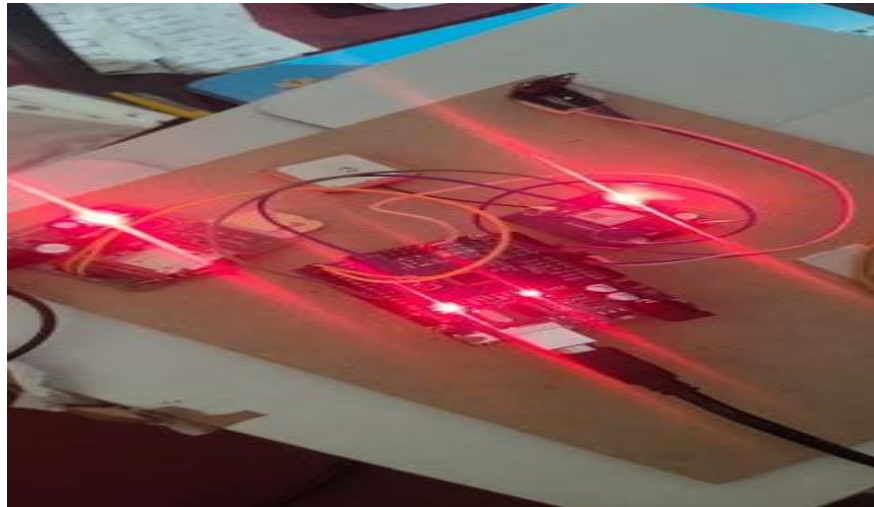


Figure (2) : Vehicle Section

Figure(3); Radio Frequency. The 10 kHz to 300 GHz frequency range that can be used for wireless communication. Radio Frequency. Also used generally to refer to the radio signal generated by the system transmitter, or to energy present from other sources that may be picked up by a wireless receiver.



Figure (3) :Ambulance Section

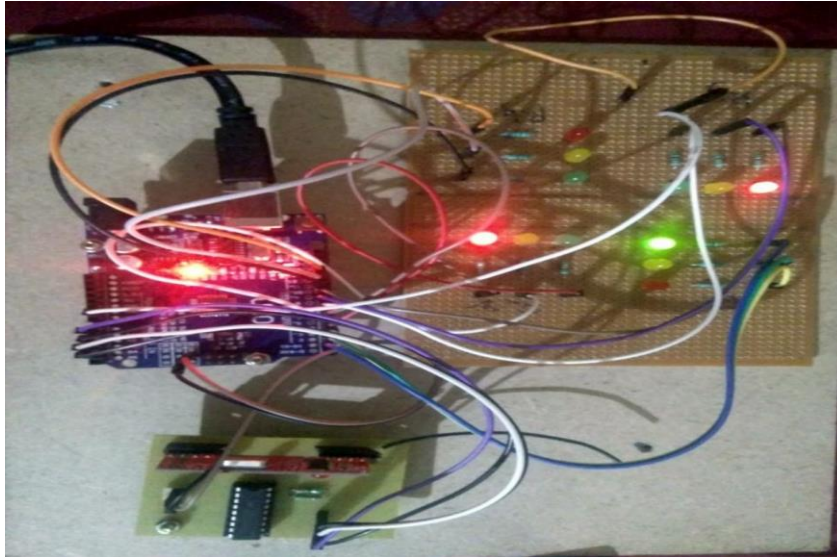


Figure (4) : Traffic Section

4 .CONCLUSION

In this system , a novel idea is proposed for traffic control, accident detection and alert systems with SMS to the user defined mobile numbers. The GPS tracking and GSM alert based algorithm is designed and implemented with IOT devices. This system can be proved to be effective to control not only ambulances but also authoritative vehicles. Thus, if this system is implemented in countries with large populations like INDIA can produce better results. This system is more accurate with no loss of time. But there may be a delay caused because of GSM messages since it is a queue based technique, which can be reduced by giving more priority to the messages communicated through the controller.

REFERENCES

1. K. Sangeetha, P. Archana, M. Ramya, Automatic Ambulance Rescue with Intelligent Traffic Light System, IOSR Journal of Engineering (IOSRJEN) Vol. 04, Issue 02.

2. K. Athavan, S. Jagadeeshwaran, Automatic ambulance rescue system, International Journal of Advanced Technology & Engineering Research (IJATER), Volume 2, Issue 2, May 2012.

3. Francisco J. Martinez, Chai-Keong Toh, Emergency services in future intelligent transportation systems based on vehicular communication networks, IEEE intelligent transportation systems Magazine, summer 2010.

4. Mr.S. Iyyappan, Mr.V. Nandagopal, Automatic accident detection and ambulance rescue with intelligent traffic light system, International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol. 2, Issue 4, April 2013.

5. Anurag D, Srideep Ghosh, GPS based Vehicular Collision Warning System using IEEE 802.15.4 MAC/PHY Standard, July 2000.