Advanced Traffic Control System for Emergency Vehicle

ShivaPrasad K S
Dept. of Electronics and Communication
Vidya Vikas Institute of Engineering and Technology
Mysuru, India

Shruthi S
Dept. of Electronics and Communication
Vidya Vikas Institute of Engineering and Technology
Mysuru, India

Chandana R Nayaka
Dept. of Electronics and Communication
Vidya Vikas Institute of Engineering and Technology
Mysuru, India

Arun Y K
Dept. of Electronics and Communication
Vidya Vikas Institute of Engineering and Technology
Mysuru, India

Asha A
Assistant Professor
Dept. of Electronics and Communication
Vidya Vikas Institute of Engineering and Technology
Mysuru, India

Abstract— **In today's world, traffic jams during rush hours is one of the major concerns. During rush hours, emergency vehicles like Ambulances, fire truck get stuck in jams. Due to this, these emergency vehicles are not able to reach their destinations on time, resulting into a loss of human lives. We are willing to develop a system which is used to provide clearance to any emergency vehicle when it struck in traffic jam. Here we clear the path of the emergency vehicle hence it can reach the destination in time. Emergency vehicle stuck in a heavy traffic condition it will send an information to the next vehicle through light medium from headlight to indicator of next vehicle. The information received by the next vehicle and it transmit to the another vehicle next to it. The process will continue till the information reaches to the first vehicle and then further information will be transfer to the traffic signal system through a road stud. The traffic signal light will turn on from red to green. The LIFI based trans receiver will be adopted to each vehicle for transmit the information. This project helps to reach the emergency vehicle in minimum time. The entire system is based on LIFI system which is a booming technology. It has many advantages over all other wireless communication technology.**

Keywords—Tracking, vehicle, Traffic Jam

I. INTRODUCTION

Now a days traffic jam is very high in main cities like Bengaluru, Chennai and Kolkata etc. Traffic congestion is one of the major problems in urban areas, which have caused hitches for the ambulance to reach the hospital in right time. Moreover road accidents in the city have been increased and the loss of life due to the accidents is even more crucial. Nearly 1.2 billion people lose their life because of delay in emergency system. Siren in emergency vehicle is not sufficient to indicate its existence when it is stuck in heavy traffic and it couldn't reach the hospital on time which may cause in loss of a patient in the ambulance vehicle. To address the issue, we are introducing advanced traffic control system for emergency vehicle. Here we use two type of technology called lifi system and vehicle to vehicle communication system. We can transmit any information from emergency vehicle to next vehicle by using lifi system. lifi system consists of transmitter and receiver part. The information send from headlight of emergency vehicle which contains transmitter part of life system to the indicator of next vehicle which contains receiver part of lifi system. Transmission of information from vehicle to next vehicle continuous until it reaches to first vehicle. The stud in the road has photo detector. It receives the data from vehicle and transmits to the traffic signal system to change the signal light from red to green.
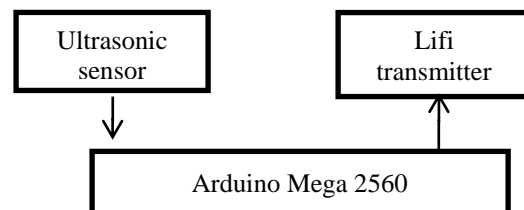
II. IMPLEMENTATION OF THE SYSTEM

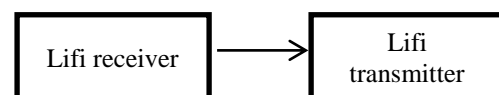Fig. 1. Lifi system for emergency vehicle

Fig. 2. Lifi system for other vehicles

Special Issue - 2018

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
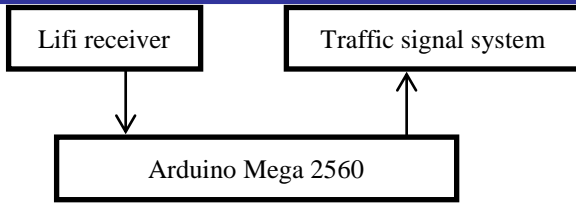**NCESC - 2018 Conference Proceedings**

Fig. 3. Traffic control system

The ultrasonic sensor sense the obstacle i.e., vehicle in front of emergency vehicle it send a signal to the controller. The controller turns on the head light and sends information through lifi system to the indicator of the next vehicle. Photo detector at the indicator receives the data and pass to the controller of that vehicle. The controller turn on the buzzer that is present at the dashboard and turn on the headlight to transfer the information to the next vehicle through lifi system. It continues till the information reach to the first vehicle. Another photo detector at the road stud receives the information from headlight of the first vehicle and transmits to the traffic signal system to turn on the green light and clear the path for emergency vehicle
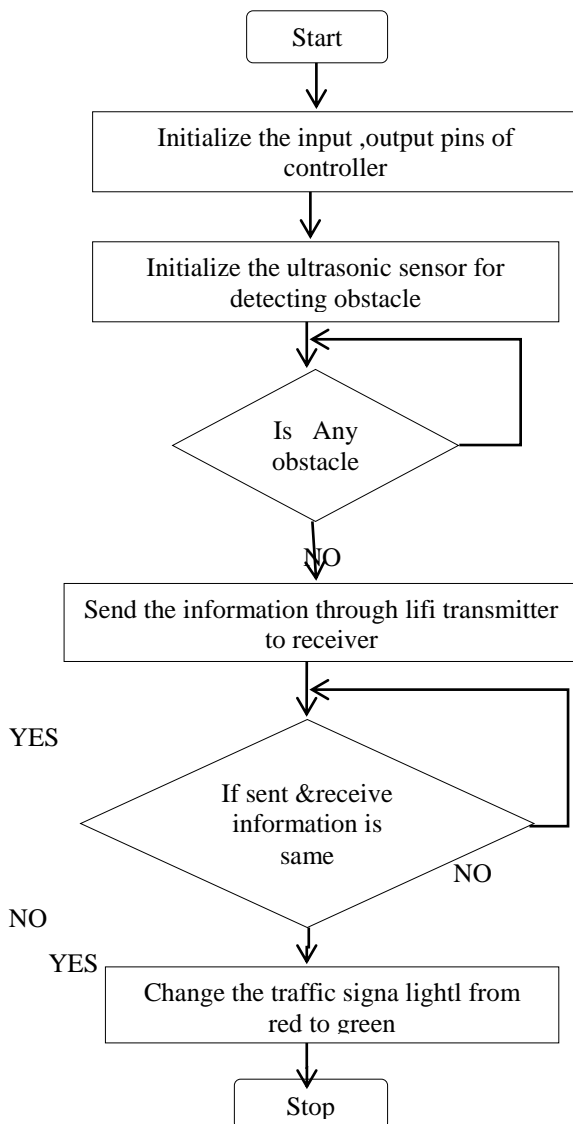

Fig. 4. Implementation of Flow chart

III. COMPONENTS

The main components required for the functioning of the above proposed solution are elucidated below.

A. Microcontroller

The Arduino Mega 2560 has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button.

- 1. Operating Voltage=5V
- 2. Input Voltage (recommended) =7-12V
- 3. Input Voltage (limits)=6-20V
- 4. DC Current per I/O Pin=40 mA
- 5. DC Current for 3.3V Pin=50 mA
- 6. Flash Memory=256 KB of which 8 KB used by boot loader
- 7. SRAM=8 KB
- 8. EEPROM=4 KB
- 9. Clock Speed =16 MHz

B. Ultrasonic sensor GH-311
- Centre frequency – 40 KHz
- Sound pressure level >=115 dB
- Sensitivity>= -65 dB
- Beam angle 80 degree
- Capacitance 2100+/-20%pF
- Working temperature -20 to 70 degree Celsius

C. MAX232 IC

It is an integrated circuit which converts signal from the serial port to the proper signal which are used In the TTL compatible digital logic circuits. Dual receiver and a 16 pin IC.

D. Photosensor-L14G1

Ii has narrow receive angle and highly sensitive to light range below 5v range. It is a silicon phototransistor with hermetical sealed package.

E. Hex schmittriger inverter 7414 IC

This device contains six independent gates each of which performs the logic INVERT function. Each input has hysteresis which increases the noise immunity and transforms a slowly changing input signal to a fast changing, jitter free output.

IV. RESULTS AND DISCUSSIONS

Emergency vehicle stuck in a traffic condition then it check vehicle presence and send a information from headlight of the emergency vehicle to next vehicle indicator which has photodetctor .further information will be transfer to the traffic signal from headlight of the next vehicle to the road stud then the signal will change from red to green. This system allows an emergency vehicle to reach the hospital in a less time
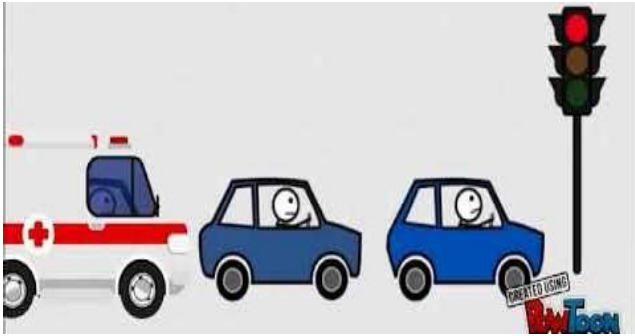
Special Issue - 2018

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
NCESC - 2018 Conference Proceedings

Fig. 5.   Sketch of the System model

V.   CONCLUSION

In this paper, an idea is proposed for saving a patient's life in a faster way possible. It is beneficial for users in case of emergencies as it saves time. With this Application, the ambulance can reach the patients as fast as possible using lifi system. Lifi system is 100 times better than other wireless communication system. It is easier for transferring data and low cost. The difficulty is every vehicle should have the lifi Trans receiver.

VI.   FUTURE ENHANCEMENT

This system can be implemented in any vehicle for establish a communication. We can share the patient information to the hospital in an easy way. The information like break apply, speed of the vehicle or any failure, damage in the vehicle etc can share through a lifi system. The patient information can be shared to the hospital through lifi communication. Traffic signal timer can be controlled dependent on number of vehicle present in front of the ambulance.

VII.   APPLICATIONS

- It can be implemented in the city which has heavy traffic density.
- We can share any information about existence of the vehicle to the next vehicle.
- This technology can be implemented in any emergency cases like fire engine truck, VIP vehicles.

REFERENCES

[1] D.V.Charahte, P. R. Wagh,, P. V. Avhad , S. V. Mankar & N.S.Mankar , "Design of Vehicle To Vehicle Data Transmission Application Using Li-Fi Technology" Dept. of Computer Engineering, KVNNIEER, SPP Univ. Pune(MS), India

[2] M. Samuel Lazar and T. Ravi "li-fi design for high speed data transmission", Department of Electronics and Communication Engineering, Sathyabama University, Chennai, TamilNadu, India

[3] Poonam Gupta, Satyasheel Pol, Dharmanath Rahatekar,Avanti Patil Dept. of Computer, G.H. Raisoni, college of engineering and management, Wagholi Viman Nagar, Pune presented a paper on 'Smart Ambulance System'

[4] Shubham Chatterjee, Shalabh Agarwal, Asoke Nath "Scope and Challenges in Light Fidelity(LiFi) Technology in Wireless Data Communication *Department of Computer Science, St.Xavier's* College(Autonomous),India Kolkata, India

[5] Dinesh Khandal, Sakshi Jain, Li-Fi (Light Fidelity): The Future Technology in Wireless Communication, 2014.

[6] Jyoti Rani, PrernaChauhan, RitikaTripath, Li-Fi (Light Fidelity)-The future technology In Wireless communication, International Journal of Applied, 2012.

[7] D. Sandeep reddy, vandhana khare, "A Smart Ambulance System", Unpublished Automatic Intelligent Traffic Control System Linganagouda R, Pyinti Raju, Anusuya Patil, Assistant Professor, Dept. of EEE, RYM Engineering College, Ballari, Karnataka, India,

[8] Smart Traffic Control System for Emergency Vehicle Clearance, D.Aswani, Student,, Department of ECE, C. Padma, (Ph.D), Assistant Professor,, Department of ECE, Priyadarshini Institute of Technology, Ramachandrapuram, Tirupati, A.P., India.

[9] DESIGN AND IMPLEMENTATION OF AVEHICLE TO VEHICLE COMMUNICATION SYSTEM USING Li-Fi TECHNOLOGY S.Nachimuthu Pooranachandran, B.Sharomena Aarthi Assistant Professor, Departement OF ECE, Velalar college of Engineering and Technology, Erode, Tamilnadu, India

[10] GPS Based Ambulance Tracking & Traffic Control System, Miss Shivali Walvekar, Miss Kinjal Morepursued B.E. in Electronics & Telecommunicationfrom Finolex Academy of Management & Technology, Ratnagiri.Mumbai

[11] An Intelligent Ambulance with some Advance features of Telecommunication, Pratyush Parida, Sudeep Kumar Dhurua, P. Santhi Priya, B.Tech, Electronics and Communication Engineering, GITAM UNIVERSITY , Visakhapatnam.