Automated Traffic Signal for Hassle Free Movement of Ambulance and Traffic Controlling

Atharva Deshpande,
Department of Electronics & Telecomunication
JSPM's Rajarshi Shahu College of Engineering, Pune.

Ganesh Thakar,
Department of Electronics & Telecomunication
JSPM's Rajarshi Shahu College of Engineering, Pune.

Bhushan Salunke,
Department of Electronics & Telecomunication
JSPM's Rajarshi Shahu College of Engineering, Pune.

Dr C.V. Rane
Professor
Department of
Electronics &Telecommunication
JSPM's Rajarshi Shahu College of Engineering

ABSTRACT

Each traffic signal is a process that must be planned to completion at a specific time, thereby adhering to non-preemptive scheduling. In static traffic systems, each traffic signal has a set amount of 'green' time, forcing the Emergency Medical truck to wait until the accompanying traffic signal turns 'green' and the piled vehicles begin to move, wasting time. We propose an alternative solution for hassle-free ambulance movement by introducing a Dynamic traffic signal using traffic density measurements, in which traffic signal flow is modelled as non-preemptive scheduling of processes to which the sole resource 'Time' is effectively allocated in order to felicitate hassle-free ambulance movement. The traffic densities are measured using an infrared sensor that shows the road's traffic level. Ambulance is connected with Radio Frequency Identification tag. A radio frequency identification reader is used to read the radio frequency identification tag. The system During golden hour, the chances of saving lives increase dramatically. Keeping this in mind, our idea intends to provide ambulances enough time to not only pass the signal without being obstructed, but also to allow for smooth traffic movement on adjacent roads joining the junction.

1. INTRODUCTION

Due to the increasing number of vehicles and their speed on highways, two large cities are connected by expressways, which are causing deaths in accidents. In addition, the city has a lot of traffic, which leads to accidents. In recent years, researchers looked at highway incidents that involved a large number of road users and resulted in more fatalities than serious injury victims, indicating that humans and the government are both negligent. Intelligent road traffic management systems and authorities are required in expressways to handle such difficulties, since they can monitor real-time traffic and associated status in cities. This system operation must be performed 24 hours a day, seven days a week to monitor and control traffic on the roadways, which can be accomplished utilizing Internet of Things (IOT) technology and a wireless sensor network. We can determine traffic level status at intersections using new technologies such as sensing technology utilized for real-time traffic monitoring. There is also a requirement for a traffic system that prioritizes ambulance routes.

2. MOTIVATION

Congestion and traffic monitoring are two of the most pressing matters around the planet. To enhance traffic conditions, this research employs IoT and the Adaptive Neuro Fuzzy Inference System (ANFIS). The MATLAB SIMULINK environment is used to create an ANFIS traffic signal controller with inputs such as waiting time and vehicle density. The traffic situations are captured with a camera and then sent to the cloud using the Arduino UNO and ThingSpeak Portal. The image is then evaluated in the server with the help of the ANFIS controller, and the relevant control signals are delivered to the stoplights.

3. PROBLEM STATEMENT

Let's talk about a few statistics, According to a report published by the Times of India an estimated 146,133 people died in road accidents in India in 2016. Unfortunately about 30% of deaths are caused by ambulance delays. Other Indian government data shows that more than 50% of people with heart attacks arrive late at the hospital, which may lead to unavailability of ambulances but most of them are due to patients trapped in traffic jams. What can we do as a responsible community about it.

4. LITERATURE SURVEY

Traffic congestion and tidal control were identified as major problems in modern urban areas, causing major disruptions to ambulances. In addition road accidents in the city have been constant and preventing the loss of lives due to accidents is very important. To do this we introduce a program called AARS (Automatic Ambulance Rescue Program). The main theme of the program is to provide smooth flow so that ambulances can reach hospitals on time and thus reduce delays. The idea of this program is to use ITS that will automatically control the robots on the ambulance path. The ambulance is controlled by the central unit which provides the smallest route to the ambulance and controls the traffic light in the area of the ambulance and thus reaches the hospital safely.

The server also determines the location of the accident with the sensor systems in the vehicle that experienced the accident and thus the server passes the ambulance to the scene. The system works automatically, thus finding the scene of the accident, controlling the robots, and helping to get to the hospital early. Monitoring and controlling traffic congestion is a major challenge in many cities today, affecting natural health and disrupting our daily routine. Due to population growth, the number of roads and vehicles is increasing, causing many problems such as travel delays, fuel wastage, air pollution and transportation issues. Monitoring and traffic control is therefore a major challenge for traffic management authorities. Here design and develop a real-time traffic monitoring system using the Internet of Things (IoT) and Audio Technology. To get traffic levels on trails using Ultrasonic sensors, its real-time use. The controller receives this data from sensors and processes.

The processed and detected data is then transferred to the server via the Wi-Fi module. Traffic is controlled using the traffic signal control method, which is based on monitoring traffic levels at lanes. If a lane has a lot of traffic, it gets the highest priority, which means it takes too long for vehicles to pass. This technique is dependable, simple, and inexpensive. For densely populated metropolitic cities such as Chennai, traffic congestion is a big concern. Ambulance service is one of the key services affected by traffic congestion. This study proposes a "Intelligent automatic traffic control for ambulance" technique to smooth ambulance transportation.

The suggested method creates an android app that uses a cloud network to connect the ambulance and the traffic signal station. This system integrates intelligent traffic signal control with RFID (radio frequency identification) technology. If an ambulance comes to a standstill owing to a traffic junction, RFID placed at the traffic signal tracks the RFID-tagged ambulance and feeds the data to the cloud.

After user approval via the mobile app, a certain signal is turned off for a while and after the ambulance passes, it regains its original flow of signature sequence If, the system is fully operational, it finds an ambulance location , controls robots. This system controls robots and saves time in emergencies. So it works as a life-saving project.

5. PROPOSED SYSTEM

Controlling traffic in real time and designing a mechanism that allows an ambulance to pass. A hardware-based traffic control and surveillance system is proposed. The proposed design solution includes an Arduino Uno controller, a radio frequency identification tag, and a battery.

Reader for radio frequency identification, IR sensor, and signal module The created module continuously monitors traffic and provides a real-time remedy to the issue. It analyses sensor readings, monitors traffic, and turns the light green if traffic is heavy. The system also detects whether an ambulance is present on any given road. The road light will turn green if an ambulance is present.

6. BLOCK DIAGRAM

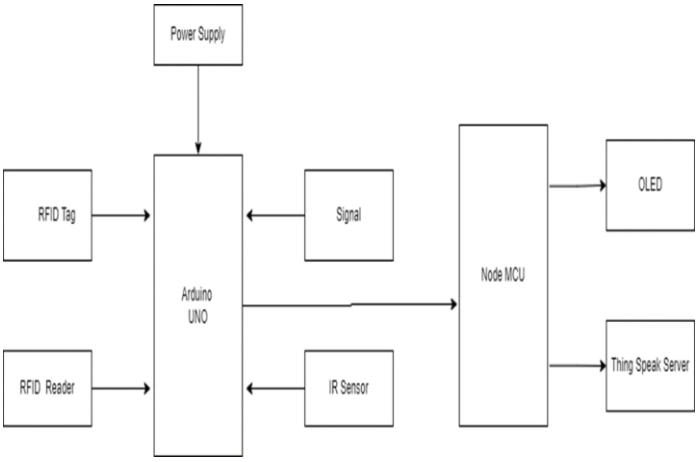

Fig.1

7. CIRCUIT DIAGRAM

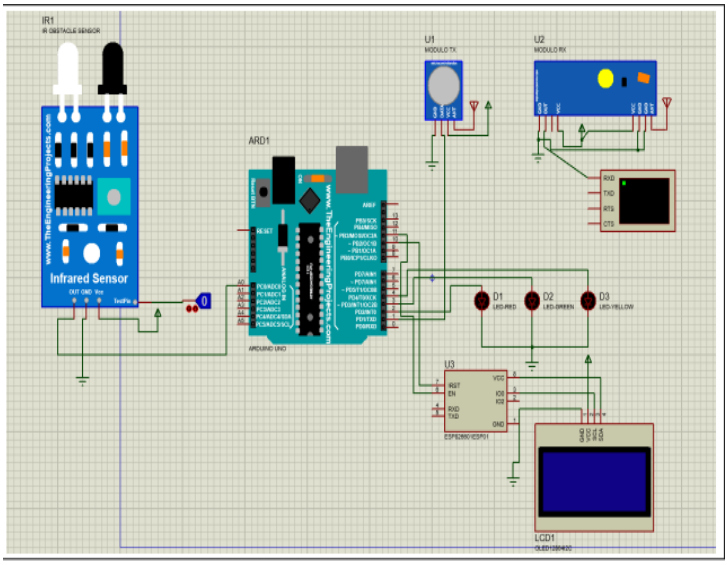

Fig.2

8. RESULT

The following are the outcomes of the project. The figures depict the software's outcomes. Figures indicate that when an ambulance is identified, it enters a loop and begins sensing the tag and traffic density.

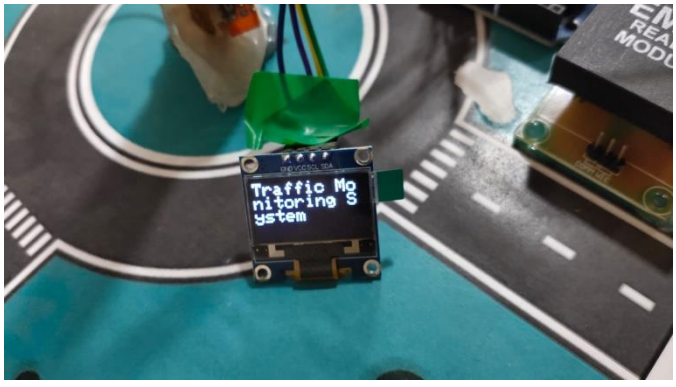

Fig.3

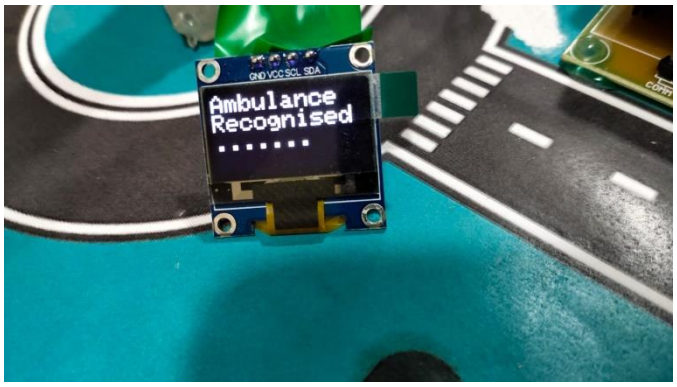

Fig. 4

As we can see, when an ambulance is spotted, the light for that lane turns green, while the signal for all the other lanes turns red, allowing the ambulance to pass.

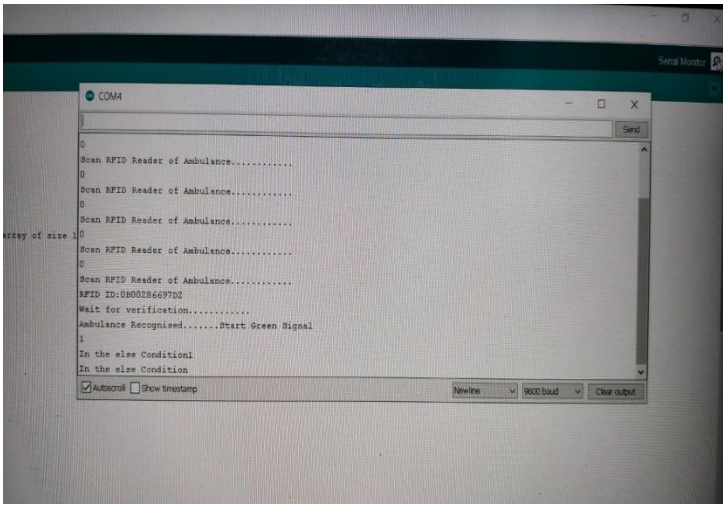

Fig. 5

The system response after the presence of an ambulance is identified after detecting the RFID Tag is shown in the diagram above.

9. CONCLUSION

Traffic congestion is a serious concern for Emergency Medical Services in underdeveloped countries, particularly in Southeast Asian economies, causing irreparable to the patients inside. The majority of stoplights are static in nature, necessitating an immediate need to adjust them. We have developed an approach that can offer EMS with hassle-free travel while not affecting commuters on other paths.

10. FUTURE WORK

The project demonstrates real-time traffic light monitoring and control. We can employ a cloud storage solution in the future to store the collected information for official usage. The camera connected to the traffic can also be used to monitor the traffic. This system can be employed not just in ambulance traffic control, but also in municipal vehicles such as buses. In the private sector, the setup can be installed at company gates to monitor which cars can pass through without being obstructed and to document their timings for later use.

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