



RFID BASED SMART MOVABLE ROAD DIVIDER WITH AMBULANCE PRIORITY SYSTEM

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ABSTRACT

In this project we are implementing a system that solves the congestion and traffic jams in majority of the cities and the underutilization of the roads. Basically, a road divider is used as a barrier to separate the road for the vehicle which are moving in two different directions. As we seen around us their road dividers are static i.e., they cannot be shifted/moved from one place to another. We have also witnessed a very high traffic only on one side of the road during peak/rush hours. When there is a high traffic, it causes accidents and many emergency vehicles get stuck in this traffic, which may result in loss of life. Therefore, an efficient system is proposed here where smart movable road divider is implemented which will work based on the road density. The ambulance priority system is also included here which provides a free path for the ambulance using RFID tags and RFID reader.

Index Terms— Arduino UNO, IR sensors, RFID tags and RFID readers

I. INTRODUCTION

Traffic has become a major problem in the developing problem due to traffic congestion, a priority is given to cities or underdeveloped cities. If the vehicle is stuck in these vehicles also. The signal violation is considered as traffic this will not only affect the time taken to travel but one of the offences which must be intimated immediately. also, the fuel is wasted. Whenever a person gets stuck in Hence if any signal violation is caused by the normal traffic a huge amount of carbon dioxide, scientifically vehicle, an alert message will be sent to the nearby traffic expressed as CO₂, will be inhaled. This affects a person's police station using a Wi-Fi module. health too. Due to this everyday traffic jam illegal activities like robbery, chain snatching are also This paper is divided as follows: section II is about the increasing. The population across the globe is increasing literature survey, section III is the methodology that has day by day but there are no proper developments taking been used, section IV is the results obtained from this place to manage with the increasing population. This is project, and the section V is the conclusion of the paper.

II. LITERATURE REVIEW

TraxPlay and Pocke [1] discussed how to reduce the traffic density. Here the PIR sensors were used to obtain the traffic density. Based to the obtained results the timers for the red and green lights were fixed.

B.Nandhu Rathi et.al. [2] Presented a solution to provide a free path for emergency vehicles easily, to detect stolen vehicles by using an intelligent traffic control system, here emergency vehicles are equipped with RFID tags, hence he signals changes automatically. The densities of the vehicles are calculated with the help of IR sensors.

SabeenJavid et.al. [3] Proposed a paper to manage the traffic using IOT. Here with the help of cameras and sensors the signal light duration was decided. With the help of RFID's emergency vehicle were also given precedence.

Hemlata Dalmia et.al. [4] Developed a project on movable road divider which used to change its position based on the density of traffic. RFID was also used to detect the arrival of the emergency vehicles.

Satya SrikanthPalle et.al. [5] Proposed a paper to decrease the traffic congestion problem.

Here with the help of IR sensors the vehicle density was calculated, and then the divider changed its position. Using RF transmitter and the receiver the arrival of emergency vehicles was known.

OBJECTIVE:

The main objective of the project is to reduce the traffic density in peak hours and to make fast, smooth, and disciplined movement of traffic and reduce road accidents. And to provide free path for the ambulance in peak hours and provide free path. For that, the first step is to check the density of the roads using IR sensor. Then the obtained value has to be compared with each other. IF it detects maximum number of vehicles the divider starts its working. Then the divider is moved creating more lanes for the denser side. After the vehicles are passed the divider and signal comes back to its original arrangement. If RFID card can be detected by the RFID reader, then the divider starts its working. The divider will move opposite to the presence of divider on road.

III. PROPOSED SYSTEM

In this proposed system we used Movable Road divider, Which operates automatically. In this Arduino UNO is used for the controlling actions. It will receive input signal by using IR sensors and RFID reader. The output will be produced by the LCD, LED'S, DC motors LED'S, buzzer.

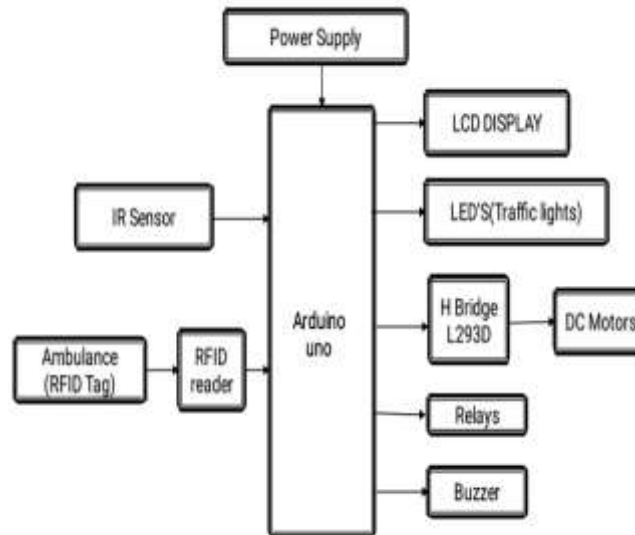


Fig 1. Block diagram of the Proposed System.

3.1.1 ARDUINO UNO



Fig 2. Arduino uno

It is an open-source microcontroller board based on the microchip atmega328p microcontroller. The operating voltage is 5v, current:20MA, SRAM:2KB, EEPROM:1KB, FLASH:32KB, CLOCK SPEED:16MHZ

3.1.2 IR SENSOR



Fig 3. IR sensor

We have two types in IR sensor they are active IR sensor, passive IR sensor. In this project we use active IR sensor. It contains 3 pins', VCC, Ground, output.

3.1.3 LCD (Liquid Crystal Display)

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector.



Fig 4. LCD Display

Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other. Without the liquid crystals between them, light passing through one would be blocked by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass through the other.

3.1.4. BUZZER



Fig 5. buzzer

A buzzer or beeper is a signalling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven, or game shows. It most commonly consists of a number of switches or sensors connected to a control unit that determines if and which button was pushed or a pre-set time has lapsed, and usually illuminates a light on the appropriate button or control panel, and sounds a warning in the form of a continuous or intermittent buzzing or beeping sound. Initially this device was based on an electromechanical system which was identical to an electric bell without the metal gong

3.1.5. DC MOTOR



Fig 6. DC motor

It is a device which converts electrical energy into mechanical energy. It consist of input voltage 12v,load current 300ma,speed is 200rpm,torque is 2kg-cm.

3.1.6. H-BRIDGE



Fig 7. H-bridge

The L293D is a 16-pin motor driver ic which can control a set of two dc motors simultaneously in any direction.it contain 4ground pins,4 input pins,4output pins,2 enable pins,2 vcc pins.

3.1.7. RFID CARD AND READER



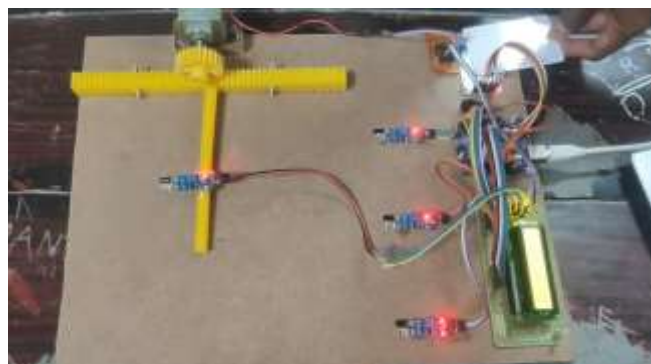
Fig 8. RFID reader, tag

Radio frequency identification refers to a wireless system comprised of two components tag, reader. The reader is a device that has one or more antennas that emit radio waves and receive signal back from RFID tag.

4. EXPERIMENTAL RESULTS

To provide a better solution for the traffic problem first we need to find the density of the road for that, here to estimate the density of the road we use 4 IR sensors. In that 4 sensors 3 sensors are used to find the low, Medium, High traffic density on side. And another IR sensor is used to detect if any vehicle is placed near to divider. If the density is low in one side of the road it displays as 'the density is low' on LCD display. If the density is Medium in one side of the road it displays as 'the density is Medium' on LCD display. If the density is High in one side of the road it displays as 'the density is High' on LCD display.so based on the density the divider movement was controlled. Smart traffic light controlling also included when ambulance with RFID tag arrives, the RFID reader sends the message to Arduino about an Emergency request. Therefore, the signal of the corresponding the divided will we moved.

RFID READER:



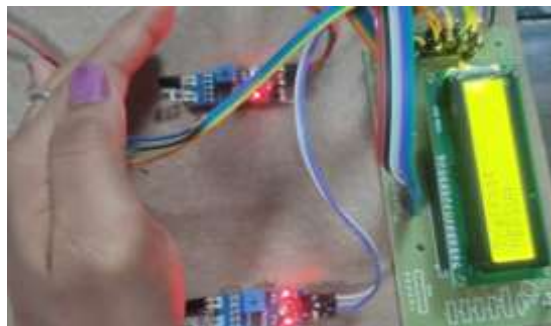
In the above fig the RFID card got detected by the RFID reader.

Ambulance detection:

In the above Fig We provided 5v of power supply to the kit through USB cable. If an RFID card got detected by the RFID reader, then it sends information to the Arduino and it allows the divider to start its working and provide free path to the ambulance.

Low density detected:

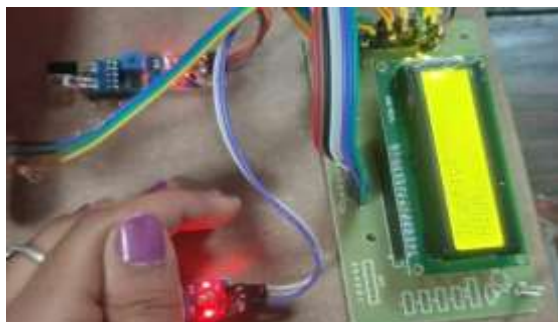
If IR Sensor detect less numbers of vehicles on one side of the road, then IR sensor sends the information to the Arduino as the traffic is low. In the above fig Medium number of vehicles got detected so it as displays as TRAFFIC IS LOW on LCD screen .

**Medium density detected:**

If IR Sensor detect medium numbers of vehicles on one side of the road, then IR sensor sends the information to the Arduino as the traffic is medium. In the above fig medium number of vehicles got detected so it as displays as TRAFFIC IS MEDIUM on LCD screen

High density detected:

. If IR Sensor detect more numbers of vehicles on one side of the road, then IR sensor sends



the information to the Arduino as the traffic is high. In the above fig medium number of vehicles got



detected so it as displays as TRAFFIC IS HIGH on LCD screen.

5. CONCLUSION

The Main Aim is to provide a better solution to the traffic problem and to save lives. So, this efficient system is designed and tested. With the help of the smart divider, traffic blocking problem was reduced. Whereas by using RFID system a free path was provided for emergency vehicles in a two-way road and signal violations were detected easily.

6. FUTURE SCOPE

To make this approach even better we can include an LCD display at the traffic signal which can act as a visual aid to convey messages for a better understanding of the implemented system. The LCD display can also act as a timer to alert the vehicles before the divider moves or before an emergency vehicle approaches. The system can be connected to a cloud which can record the data and further use it to predict the flow of traffic to operate the divider minutes before the threshold is exceeded.

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