DESIGN & IMPLEMENT A SMART SERUCITY TRAFFIC MANAGEMENT SYSTEM BY USING AURDINO AND IOT

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Abstract

The Traffic condition in the world countries like India in many cities urban and rural areas make many problems. The large number of vehicles increase on road it cause many problem like, failure of signals, bad traffic management, signals breaking due to this increasing in the percentage of accident and poor law for traffic. One of the major problems with Indian cities is that the existing infrastructure is poor for the traffic management and it cannot be expanded more. It cause negative impact to the economy and peoples. There are various solution or methods available for traffic management such as wireless network sensor, infrared sensor, loop detection, video data analysis, etc. All these methods are good effective methods of smart traffic management. But the problem with these system is that the high maintenance, highly cost for the installation. These systems are used for the traffic management system. But the technologies are implement in and developing countries as they are more complex and effective.

This project consist of one micro-controller ATmega328p kit is installed in the Zebra crossing on the road and another kit in the vehicles. ATmega328p family which collect the input signal for at the time of the braking the signal through the TSOP1738 sensor. Wi-Fi module receive the request call and send the current status of the vehicle through SMS. An IR LCD screen is additionally linked to the micro-controller to show the exact time and vehicle number on the screen and also a buzzer is linked with micro- controller to sound up the vehicle name with number those break the signal.

Keywords: - *ATmega328p micro-controller, TSOP1738 sensor, IR LCD, IOT, Wi-Fi module ESP8266, Buzzer, Smart Traffic Management.*

1. INTRODUCTION

Traffic management and signals are become an integral part of women day to day life. In metropolitan cities of India traffic congestion is the major problem and Most of the cities are undergoing many problem because of rapid urbanization. Traffic congestion is one of the major problem of urban area due to sudden increasing the vehicles in the growing cities. Today it is very difficult to find the location of the vehicle who's person breaks the signal and doesn't follow the rules of the traffic and sometimes it cause very dangers accident, because of accident the major impact goes to the family, due to the accident most of the time the person loss her/him life. Time is very important for working people because of the reason people break the signal, but these is not a solution.

To avoid this problem different, different technologies like a Micro Electro Mechanical System (MESMS) like IR LCD, buzzer, WIFI module ESP8266, ATmega328p, LCD, TSOP17388 sensor connected to the processor unit. At the moment of breaking the signal or accident, the sensor detect the vehicle who's break the signal and give the information to the micro-controller, which display the information to the LCD screen and also send SMS to the police and the person who break the signal with exact location ,time and reason . If accident occur in place it also send the exact location to the Ambulance, near by police and one of the family member through a SMS. Here the system also provide the user or police to track the vehicle location, when he/she required.

2. Problem Statement

Accident which is happened on the road is being the major issue of taking a live in every year, in metropolitan cities police are lots of responsibilities including controlling law & situation. The traffic management department implement various traffic rules and signals. But the people not follow the traffic rules and breaks the signal due to this the major and minor accident cause and also a traffic jam problem caused, so to overcome this problem we design the new technologies called smart traffic management.

3. Objective

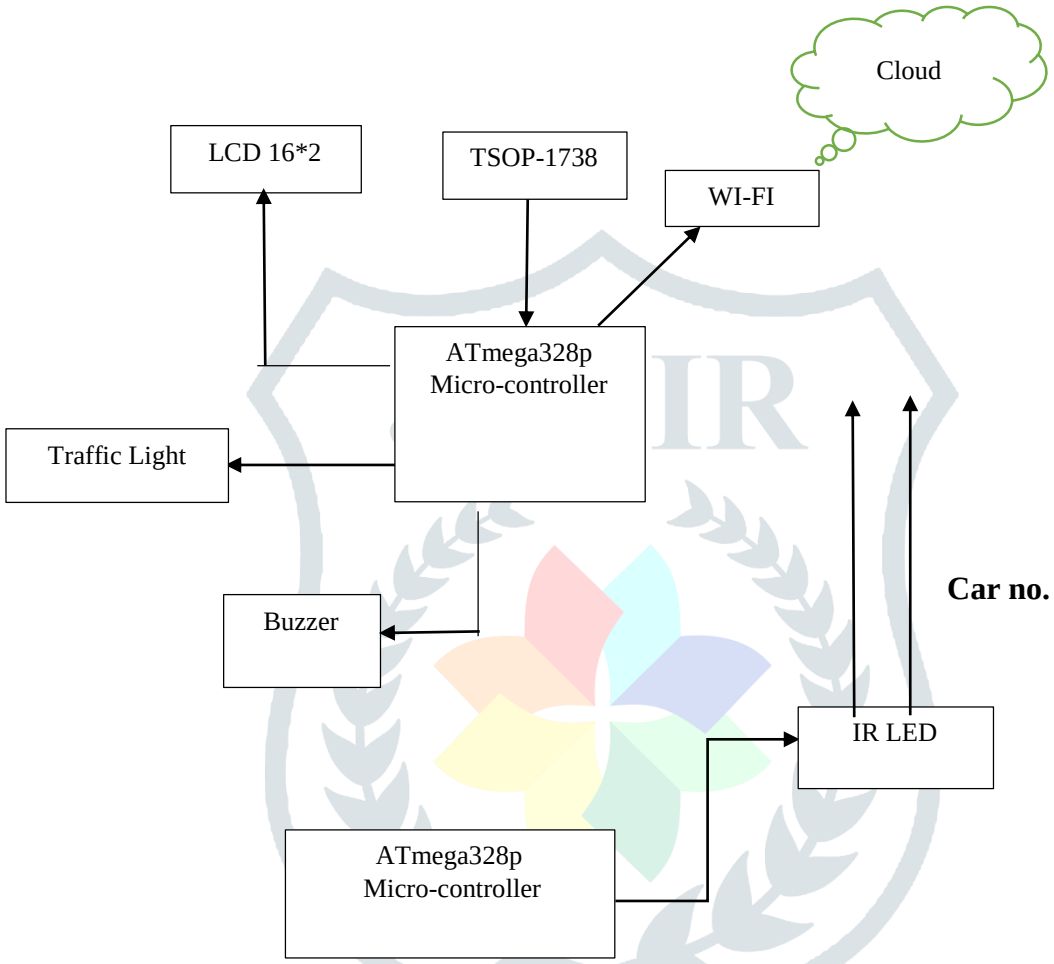
The main primary objective the people follow the traffic rules and the main source of causing accident is broken the signal and over-speeding. But most of the time signal broken is caused accident so, the purpose is to decrease the accidental problem.

4. Idea prototype

Considering a scenario where a person broken the signal, then the vehicle number is display on the LCD screen which installed on the signal and send online Challan to that person with exact location and reason through a SMS. In case any accident happen it also send SMS to the Family member, Police, Ambulance through a cloud or WI-FI.

5. BLOCK DIAGRAM

Signal



Car

Fig No.5.1 Block Diagram

6. Wireless Sensor Network

Wireless Sensor Network (WSN) is a network which consists of various sensors that works wirelessly. Sensor is device which measures a physical value and converts it into an observer or by an instructor. There are several types of sensors are present such as thermal, electromagnetic, mechanical, chemical, optical radiations and so on. WSN are network that consists of sensors which are distributed in an ad-hoc manner. Using this sensors we can determine various physical and environmental conditions such as temperature, sound, pressure, home automations, traffic control, and health care applications. As shown in figure 1 there are various sensor nodes which are connected to each other and forms a chain which is connected to the gateway sensor node. Your mobile, laptop, tablet is acts as a wireless node in the wireless sensor network. Some characteristics of WSN is that it can also be deployed in extreme environmental condition, it can also be used to detect enemy drones, fighter planes & Unmanned Arial Vehicle (UAV) in the defence sector.

6.1 Arduino

Arduino is a hardware component used for building electronics projects. Arduino is made up of both a physical programmable circuit and a bunch of software, or IDE (Integrated Development Environment) that runs on your computer. It is having input, output pins & AC connector as shown in below figure 6.1

Fig 6.1 Arduino (ATmega328p)

6.2 TSOP-1738 Sensor

The TSOP sensor is an IR Receiver Sensor, which is used to receive IR signals of 38 kHz. The sensor operate on 5v and consumes around 5A to operate. It also decode the remote signals .it cause low power consumption.

Fig no 6.2 TSOP-1738 sensor

6.3 IR Sensor

An IR sensor is an electronic device that emit in order to sense aspects of the surroundings. An IR sensor measure the heat of an object as well as detects the motion. These type of sensor measure only infrared radiation, rather than emitting it that is called a passive sensor.

Fig no.6.3 IR Sensor

6.4 WIFI modulo ESP8266

The ESP8266 Wi-Fi module is a self-contained SOC with integrated TCP/IP protocol stack that can give any micro-controller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking function from another application processor.

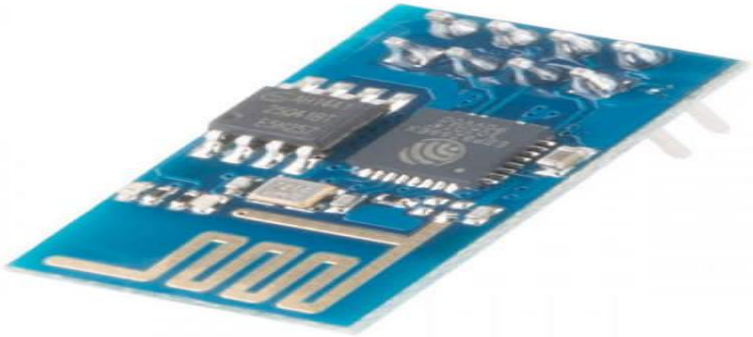


Fig no 6.4 Wifi Module ESP8266

6.5 BUZZER

A buzzer or beeper is an audio singnalling device, which may be mechanicsl, elctromachanical, or piezoelectric. A buzzer is a small yet efficient component to add sound features to our project system.

Fig no 6.5 Buzzer.

7. IMPLEMANTATION

This idea is depend on smart security traffic management system using IOT. To code and handle this system we used java coding language and also a SQL and PHP is used.

8. HOW IT's WORK

In these fig 8.1 show the signal system the kit are installed in the zebra crossing and also a buzzer, LCD screen is attached to the processing unit.

Fig no 8.1 signal

In these fig 8.2 show the single is off but vehicle break the signal and cross a zebra crossing line in the case it capture the vehicle number and show in the LCD screen placed on the signal and send information to the RTO and automatically send SMS to the that vehicle owner.

Fig no. 8.2

signal breaking vehicle If in case any accident happen in any place or to track the any vehicle or single breaking vehicles then it automatically send SMS to the their family, near by Police and ambulance with emergency SMS and exact location respectively through a Wi-Fi.. Show in fig 8.3

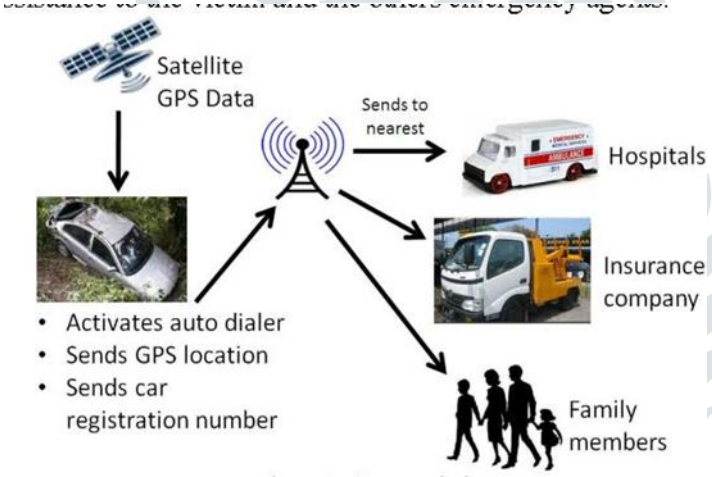


Fig no 8.3 SMS sending procedure

9. CONCLUSION

The ultimate goal is to control the traffic system smartly and public follow the rules of traffic and secure our life. This system can use in anywhere. The controller can control traffic moment and detect the signal broken vehicles, accidental place smartly.

10. REFERANCE

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