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VEHICLE ACCIDENT PREVENTION SYSTEM

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Abstract - *This project deals with prevention of vehicle accidents .In this project, we are designing a system which will automatically incur penalty to the car driver for violation of traffic rules which means blocking pedestrian lane,crossing signal when it is red, crossing the speed limit in speed limit zone. Also the car will not start if the driver is drunk. This will help to bring discipline on road*

Key Words: **Node mcu, gsm module 800l, Relay,MQ3 sensor, Motor driver**

1.INTRODUCTION

In the past few years, traffic accidents & congestions have increased enormously. Though the vehicle volume has increased exponentially, the road infrastructure has not been improved proportionately. This in turn leads to increased traffic congestion and road accidents. Different technologies are there to detect traffic congestion and to make congestion management more efficient, but these technologies have several drawbacks, such as installation problems, complexity, cost, etc. We realize that road accidents is one of the major problem nowadays in every city.

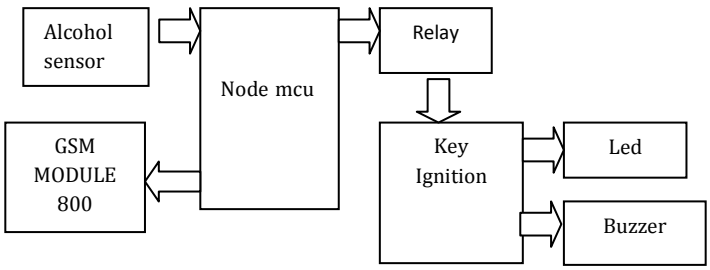
Major cause of road accidents are:

- Drink and drive
- overspending
- traffic rules violation

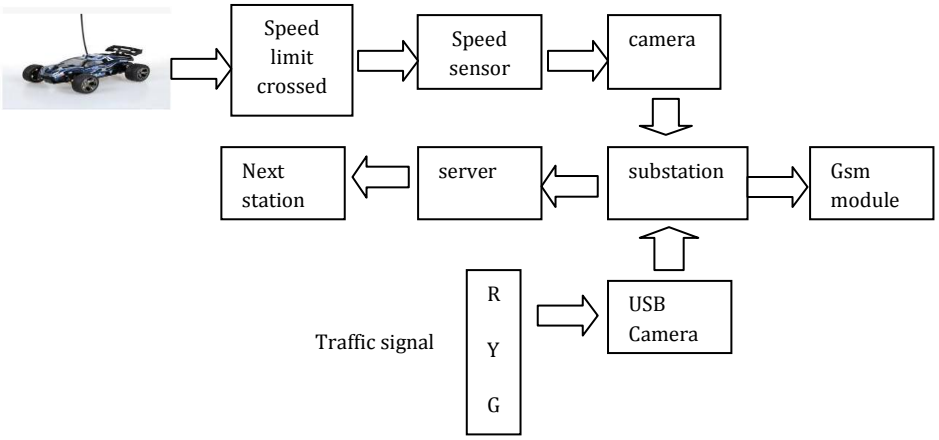
In an attempt to reduce the problems related to traffic & improve the traffic discipline, advanced technological solutions have been proposed in this project. In this project we are designing a system,which will continuously monitor the vehicle using USB Camera and will automatically incur penalty to car driver for violation of traffic rules such as blocking pedestrian lane, crossing signal when it is red, crossing speed limit in speed limit zone. Also if driver is drunk then car will not start. This will help to bring discipline on road.

1.1 Block Diagram

Drink and Drive



Over speeding and Traffic Rule Violation



2. WORKING

- **FOR DRINK AND DRIVE CASE**

Our system is designed in such a way that the ignition circuit is controlled by interfacing set of sensors,logic circuit and node mcu. we know that the ignition key of vehicle has to be turned in two steps, one for switching ON the electrical circuit and second step for cranking the engine. as per our design, exhaled air reaches the sensor unit where it is checked for alcohol i.e whether the person is drunk or not, depending on the output of the node mcu controls the ignition process. If the person is drunk then ignition will be locked automatically and car will not start and through gsm module message will be sent to his /her family members. If the person is not drunk then car engine will be turned ON.

- **FOR OVERSPEEDING /TRAFFIC SIGNAL**

Automatic license plate recognition is a Computer Vision technique which is able to recognize a license plate number. This system is useful in many field likes parking lots, private and public entrances, theft control. This paper we designed such a system. First we capture the image from camera then load into system after that we used OpenCV library tools. Then we make the training set of different characters of different sizes. On the basis of these training set we extracted the character from images. When the license plate is detected, its digits are recognized and send to server.

Capture

The image of the vehicle is captured using a high resolution photographic camera. A better choice is an Infrared (IR) camera. The camera may be rolled and pitched with respect to the license plates.

- **Preprocess**

  Preprocessing is the set algorithms applied on the image to enhance the quality. It is an important and common phase in any computer vision system. For the present system Preprocessing involves two processes: Resize – The image size from the camera might be large and can drive the system slow. It is to be re-sized to a feasible aspect ratio. Convert Color Space – Images captured using IR or photographic cameras will be either in raw format or encoded into some multimedia standards. Normally, these images will be in RGB mode, with three channels (viz. red, green and blue).

License Plate Extractor

This is most critical process in License Plate Recognition System. In this process we apply different techniques on image to detect and extract license plate. This process is divided in two parts.

License Plate Detection through Haar-like features

In image processing techniques, Haar-like features are used torecognize objects from image . If our proposed system is selected to detect only license plates then the Haar-like features are used for this purpose and no further processing is done. This technique is old and laborious and more over needs a large database to store the collected samples nearly about 10000 images of the plates and characters

License Plate Detection through Edge Detection

In the other case, if our proposed system has to recognize license plates, then the binary image is created from the image. After that following steps are performed to extract license plate from binary image:

1. Four Connected Points are searched from binary image.

2. Width/Height ratio is matched against those connected points.

3. License Plate region is extracted from image.

4. Transformation of extracted license plate is performed.

Then the extracted license plate is passed to next component for further processing. This approach is quick and takes less execution time and memory with high a efficiency ratio. That's why we have adopted this technique in our project.

Character Segmentation

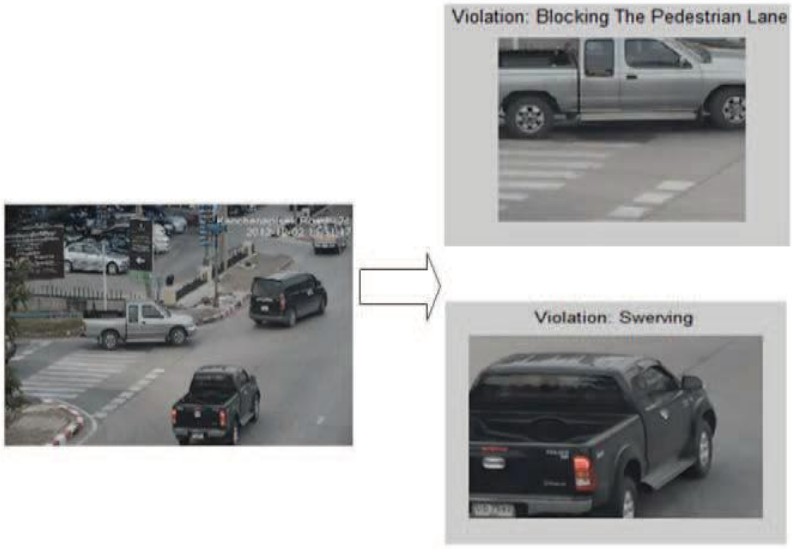
In this part further image processing is done on extracted license plate to remove unnecessary data. After character segmentation, the extracted license plate has only those characters that belong to license number. This also achieved with the width height ratios matching with the contours detected on extracted number plate.

Optical Character Recognition

Finally, the selected blobs are send to a Optical Character Recognition (OCR) Engine, which returns the ASCII of the license number.

Server Side

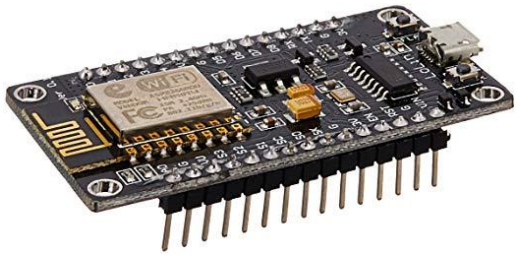
The licence no is then sent to server through php on server side that data is stored in MySQL database.The data can be seen using server ip, on any browser.



2.1 COMPONENTS

1. NODE MCU
2. L298N MOTOR DRIVER
3. ALCOHOL SENSOR MQ3
4. 12V DC RC MOTOR
5. GSM MODULE 800L
6. USB WEB CAMERA

1. NODE MCU



We have selected Node MCU as controller for our project, Because it can connect to Network and also work as controller. Node MCU use esp 8266 12e Wi-Fi Soc chip set , it has 13 GPIO pins.Node MCU easily work with databases servers. We are post our data in remote server for global access. Node MCU can be connect to other router and can also work as router on same time.To edit external Wi-Fi router settings we are using both modes. Simple HTML page is used to get SSID and password of external Wi-Fi router setting. Once submitted the data is stored in EEPROM and then after software restart it get automatically connect to router and connect to internet.In our project Node MCU checks sensor data in every 20 microsecond and post data to server. In server one PHP program check for post and save it in database.

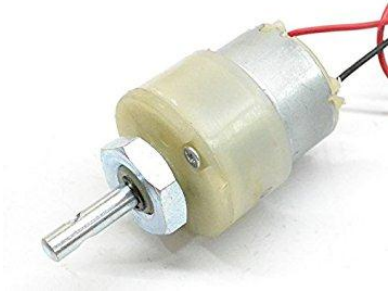
2. L298N Motor Driver

It is an integrated monolithic circuit in a 15- lead Multiwatt. It is a high voltage , high current dual full-bridge driver designed to accept standard TTL logic level and drive inductive loads such as relays, solenoids, DC and stepping motors. Two enable inputs are provided to enable or disable the device independently of the input signals.The emitters of the lower transistors of each bridge are connected together rand the corresponding external terminal can be used for the connection of an external sensing resistor. An additional Supply input is provided so that the logic works at a lower voltage.

3 Alcohol Sensor MQ3

MQ3 GAS Sensor is a very easy to use and very handy sensor. It is suitable for sensing Alcohol gas concentration.The Sensitive material of MQ-3 gas sensor is SnO2, which is with lower conductivity in clean air.MQ3 Alcohol GAS Sensor can detect Alcohol gas concentrations anywhere from 200 to 10000 ppm. The MQ3 GAS sensor has a very high sensitivity to Alcohol gas. The sensitive material of Q3 Sensor is SnO2, which has lower conductivity in clean air. When the target alcohol gas exist,the sensor's conductivity is higheralong with the gas concentration rising.MQ3 GAS sensor has high sensitivity to Alcohol, and good resistance to disturb of gasoline, smoke and vapour. The sensor could be used to detect alcohol with different concentration, it is with low cost and suitable for different application.

4 12v dc RC motor



DC motors are electric motors that are powered by direct current (DC), such as from a battery or DC power supply. Their commutation can be brushed or brush less. The speed of a brushed DC motor can be controlled by changing the voltage

alone. By contrast, an AC motor is powered by alternating current (AC) which is defined by both a voltage and a frequency. Consequently, motors that are powered by AC require a change in frequency to change speed, involving more complex and costly speed control. This makes DC motors better suited for equipment ranging from 12VDC systems in automobiles to conveyor motors, both which require fine speed control for a range of speeds above and below the rated speeds.

5 GSM MODULE 800L

The SIM800L module supports quad-band GSM/GPRS network, available for GPRS and SMS message data remote transmission. The SIM800L communicates with microcontroller via UART port, supports command including 3GPP TS 27.007, 27.005 and SIMCOM enhanced AT Commands.It also has built-in level translation, so it can work with microcontroller of higher voltage than 2.8V default. Besides, the board also supports A-GPS technique which is called mobile positioning and gets position by mobile network. This features make it can also be a tracker module.

6 USB WEB CAMERA

A webcam is a video camera that feeds or streams its image in real time to or through a computer to a computer network. When "captured" by the computer, the video stream may be saved, viewed or sent on to other networks travelling through systems such as the internet, and e-mailed as an attachment. When sent to a remote location, the video stream may be saved, viewed or on sent there.

3. CONCLUSIONS

This system can be use for prevention of vehicle accidents and for driver's safety purpose. By using this system we can be able to maintain discipline on road. If traffic rule is violated,It sends the alert message to the authorized person.

ACKNOWLEDGEMENT

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REFERENCES

- Indian Penal Code,1860, Section 279- Rash driving orriding on a public way. [Online]:http://indianlawcases.com/Act-Indian.Penal.Code,1860-1726
- Inara Hasanali (2016) Alcohol and Driving. [Online]:http://www.medindia.net/patients/patientinfo/alcoholdriving-indian-law.htm
- G. Ou, Y. Gao and Y. Liu, "Real-Time VehicularTraffic Violation Detection in Traffic MonitoringStream," in *Web Intelligence and Intelligent AgentTechnology (WI-IAT), 2012 IEEE/WIC/ACM International Conferences, Macau, 2012.*
- EFU magazines, and www.EfU.com
- "http://www.internationaljournalssrg.org/IJECE/2015/Volume2-Issue2/IJECE-V2I2P104.pdf