

Recognition of Vehicle Number Plate and Measure the Distance

B. Jyothi Sravya, V. Naga Lakshmi, J.Rajasekhar

Abstract: *Now a days most of the developing cities most of the accidents are happening frequently because of not following traffic rules so in this paper we have found a solution to avoid this kind of problems if any vehicle jumps the red signal is on then automatically start the camera. And capture the image of the vehicle and extract the number plate from the vehicle and send it to the data base automatically and send the payment amount and link as SMS to the vehicle owner which includes date and time. To use the ultrasonic sensor which will be helpful for calculating the distance between zebra crossing line and vehicles.*

Keywords: *Raspberry pi, Ultrasonic sensor, Traffic density, Open CV, OCR (optical character recognition).*

I. INTRODUCTION

Recognizing vehicle number plates is a difficult but much needed system. This is very useful for automating toll booths, automated signal breakers identification and finding out traffic rule breakers. Here we propose a Raspberry Pi based vehicle number plate recognition system that automatically recognizes vehicle number plates using image processing. The system uses a camera circuit interfaced to a Raspberry pi. The system constantly processes incoming camera footage to detect any trace of number plates. On sensing a number plate in front of the camera, it processes the camera input, extracts the number plate part from the image. Processes the extracted image using OCR and extracts the number plate number from it. Thus we put forward a fully functional vehicle number plate recognition system using Raspberry Pi.

Statement of purpose:

- To reduce the accidents occurring day by day.
- To measure the distance in between vehicle and zebra crossing.
- To increase the safety of people in the car.

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* Correspondence Author

B.Jyothi Sravya*, Electronics and Computer Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur Dist., A.P India.

V.Naga Lakshmi, Electronics and Computer Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur Dist., A.P India.

J.Rajasekhar Assistant Professor, Electronics and Computer Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur Dist., A.P India

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II. INTERNET OF THINGS

A dynamic overall association establishment with self-structuring limits subject to standard and interoperable symmetricalness traditions where physical and virtual things have characters, physical properties, and virtual personalities And use sharp interfaces, and are reliably planned into the information sort out. The Internet of Things (IOT) is portrayed by ITU and IERC as a dynamic overall organize establishment with self-structure limits depletion on standard besides, interoperable correspondence traditions where physical and virtual "Equivalent words/Hyponyms (Ordered by Estimated Frequency) of thing " have characters, physical character and virtual personalities, use canny interfaces and are reliably planned into the information orchestrate. Over the span of the latest twelvemonth, IOT has moved from being a Synonyms/Hyponyms (Ordered by Estimated Frequency) of thing cut - edge vision - with once in a while a particular dimension of progression - to a growing basic supply world. Telecom official consider that Machine-to-Machine (M2M) and the Inter-net of Things are transforming into an inside business focus, uncovering basic development in the amount of related inquiries in their framework. Gadget makes e.g. concerning wearable comfort anticipate a full new business partition towards a more broad allotment of the IOT. These geographic campaign results are as of now sustaining into headway, and a movement of sections is open, which could accommodatingly be mishandled and overhauled by the market. Though greater players in a few applications program zones still don't see the voltage, numerous them spring watchful situation or even enliven the walk by bringing forth new terminal figure for the IOT and including additional portions to it. Likewise end client in the private and business space have nowadays acquired an important capacity in overseeing canny devices and masterminded applications. As the Internet of Things keeps on development, advance potential is assessed by a mix with related advancement strategies and thoughts for instance, Cloud figuring, Hereafter Internet, Big Data, Robotics and Semantic loan. The 1 feeling of believe is clearly not new everything considered yet rather, as these thoughts cover in a couple of segments (concentrated and advantage models, virtualization, interoperability , computerization), veritable trailblazer see progressively the piece of correspondingly instead of guarding particular space.

III. LITERATURE SURVEY

In the literature, many license plate detection algorithms have been proposed. Although license plate detection has been studied for many years, it is still a challenging task to detect license plates from different angles, partial occlusion, or multiple instances. License plate detection investigates an input image to identify some local patches containing license plates. Since a plate can exist anywhere in an image with various sizes, it is infeasible to check every pixel to locate it. Generally, it is preferable to extract some features from images and focus only on those pixels characterized by the license plate [1]. This framework is essential in India where the quantity of passings because of not following traffic signals is expanding step by step. It will fill two fundamental needs. Initially, it will help in avoiding mishaps be it right calculated and betray traffic hits or backside impact, coming about because of not following traffic rules. Besides, there will be decrease of required labor which will result in the decrease of defilement for example offering influences to the on obligation traffic cop. Our proposed framework incorporates a camera which will be utilized to take photos of the vehicle which are unlawfully crossing traffic lights, when the flag is red and not following the principles. And afterward with the utilization of picture preparing methods it will recognize the number plate and sort out the enlistment number. The enrollment number would be sent to the control room found remotely [2]. The target of this paper is to finished programmed acknowledgment framework utilizing OCR, they have used to the current shut circuit, TV or street rule for witness cameras or on the other hand ones explicitly intended for the undertaking. The pictures of vehicles tag is caught and is prepared by division of character and is confirmed by Raspberry pi processor confirmation proposed [3]. The paper present the calculations for limitation of yellow shading tag utilizing morphological activity, character division utilizing histogram and force projection and optical character acknowledgment utilizing layout coordinating. The traffic checking framework by enrollment number distinguishing proof is these days created as answer for traffic observing with the assistance of innovation. For this situation the vehicles bouncing the signs will be distinguished by laser and LDR sensor and there pictures caught by camera. The perceived enlistment number of vehicle will be put away. Additionally it gives SMS alarming framework to the observing individual at whatever point no of vehicle surpasses broking signal [4]. Further, in this paper we mean to now a days the structured mechanical framework for controlling the terminal purposes of vehicles in thickly populated areas. Advance computerized maps have the limit with respect to ongoing refreshing properly including data on regions where speed points of confinement ought to be decreased because of unfriendly climate conditions or around mishap scenes and street works. This likewise examines the on-board creative framework by assessing the surroundings of the vehicles and in this way improving the wellbeing and productivity of driving. It lies on vital capacity for different acknowledgments like traffic signs, signs and specialists are displayed. Edge work for combination of sensors and control module in an adaptable multi-specialist framework is given. A SMS which contains

the stream GPS fix of the vehicle is sent by means of a GSM module to the police control space to alarm the police constrain. Along these lines it gives a viable and practical answer for the issue of alcoholic driving in vehicles. Congestion in traffic is a serious issue. In existing system signal timings are fixed and they are independent of traffic density. The Large red light delays leads to traffic over crowding [5]. In this, IOT based traffic control framework is actualized in which flag timings are refreshed dependent on the vehicle tallying. This plan comprises of WI-FI handset module it transmits the vehicle check of the present framework to the following traffic flag. In view of traffic thickness of past flag it controls the signs of the following sign. The framework depends on raspberry-pi and Arduino. The entire vehicle tallying is performed by raspberry pi. Traffic clog is portrayed by longer outing occasions, slower speeds, and expanded vehicular lining. At the point when the traffic is high that the collaboration between vehicles backs off the speed of the traffic stream, these likewise results in some rush hour gridlock stuffing. The regular frameworks depend on clock which causes impediments, for example, wastage of time, overwhelming automobile overload, despite the fact that there are no vehicles out and about, still flag is red as a result of static timings of clocks of the flag.

IV. THEORETICAL ANALYSIS

Raspberry Pi usually has a CPU, RAM, various ports, WIFI and Bluetooth, which is RPi3 model B, requires about 1Amps of power which you can supply through the Micro USB slot using your old cell phone charger. Under powered P is will shut down immediately which can causes omeserious damage its obscure to read the manuals first. Also, you may have to Amp it up if you are using pen drive. The 4USB ports can be used to connect wireless keyboard and a HDMI port is included so that you can connect it to a monitor. The 1.2GHz 4-core CPU is enough toper form light tasks and play games like Minecraft Mobile Edition. However, it will al low you to watch videos (INOSMC) for a longer time. In layman terms, consider Pi as powerful version of Intel's stick PC.

Steps to install software:

- Install the raspbian OS
- Take SD card we have to install Rufus application and Insert the SD card to raspberry pi
- Next install VNC viewer ,then open and enter the IP address of raspberry pi.
- Connect the raspberry pi to the laptop using USB and LAN cable, then the screen will open.

V. EXPERIMENTAL INVESTIGATION

First install the raspberry Pi setup in our laptops then to connect the raspberry Pi to laptop using power supply cable and USB cable. The USB web camera is connected to the raspberry Pi. Then to install the VNC viewer in our laptops then open the terminal to write the commands for capturing the image using webcam.

Then open the python programming to write the code for recording of the video using webcam. The webcam is placed at the traffic signals The red and green light blink for 5 times alternately as per instructed in the code then green light gets on next the red signal is on the camera is on automatically.



Fig 1(a) Number plate

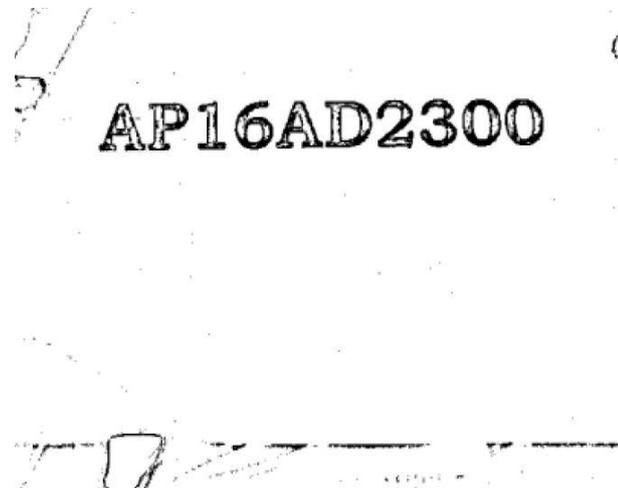


Fig 1(b) after extraction

If any one crosses or jumping of signal is done the red signal then automatically record the video using webcam. And captures the vehicle number plate then all information is send to the cloud using raspberry Pi. To extract the vehicle number plates to the video recorded .then to send fine amount and payment link to the message of the vehicle owner and near the traffic police.

The execution of code is done in step by step way at first The camera initialization successfully done.

Then starting of Green signal.

Next green signal time completed.

Starting red signal.

Vehicle with signal jumping captured. Processing image.

Identified number plate: AP16AD2300

Payment link: <https://imjo.in/xeXDb2>

In the above link the owner can pay their fine itself with the help of debit or credit card.

Interfacing video:

The camera recording will starts when there signal is on and the video stores all the vehicle details who are crossing the signals and not following rules does vehicle plates are extracted out and will trace from the foot ageand detect the number plate.

Command:

```
Sudoapt-get install python-opencv video-sudo service
motion restart
Sudo motion
```

A. Webcam

A webcam in this task is utilized to perceive client's face and show tweets. Any sort of webcam is good with Raspberry Pi. In this undertaking the webcam utilized is Logitech C270 HD Webcam.



Fig 2.Webcamera

B. Raspberry pi

A Raspberry Pi is a Master card estimated PC initially intended for instruction, roused by the 1981 BBC Micro. Maker Eben Upton's objective was to make an ease gadget that would improve programming abilities and equipment understanding at the pre-college level. In any case, on account of its little size and available value, it was immediately received by tinkerers, producers, and hardware aficionados for ventures that require in excess of a fundamental microcontroller.



Fig 3. Raspberry pi

C. Ultrasonic Sensor

Ultrasonic Sensor:-Ultrasonic sensor is a device that can measures the distance to an object by using sound waves. It measures distance by sending out a sound wave at specific frequency and listening for that sound to bounce back. In this project ultrasonic sensor is used to calculate distance from 2cm to 400cm.Ultrasonic sensor is used to calculate to distance which works on 5v. It has 4 pins that is eco, trigger, ground and VCC. Here eco pin transmit ultrasonic sound waves.

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Fig 4. Ultrasonic sensor

VI. PROPOSED SCHEME

The traffic signals junction when there light is turn on then automatically the camera will be in on condition and it will record, there recording will start at that particular time when the red signal is in on condition when the green signal is on the camera will be in off condition. There recording will be stored in memory card which is predefined in the code. If anybody cross the signal in the red light the video will be recorded in that particular video if there any vehicles we are going to capture the image of the vehicle which is stored in the video. From the image of the vehicle we are going to extract the number plates and that particular number will send to cloud.

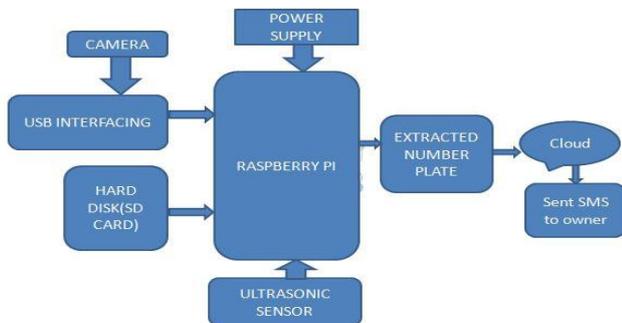


Fig. 5 Illustration of block diagram

Software used: VNC Viewer

Virtual Network Computing is a graphical desktop shares the system that allows for the remote control to the desktop interface of one to computer machine from another computer if any update are on the screen. The desktop of the Raspberry Pi a window on your computer. VNC Connect from Real VNC is included with Raspbian, the VNC Server and it allows you to controlling Raspberry Pi and VNC Viewer, which allows to control desktop computer s remotely from Raspberry Pi. This gives remote access to the desktop this runs on Raspberry Pi. The IP address of raspberry pi is entered in the VNC viewer

Python programming:

Python is an interpreted high-level programming language

for general-purpose programming. Python has a design philosophy that emphasizes code readability, not ably using significant whitespace. It provides constructs that enable clear programming on both small and large scales. Python features a dynamic type system and automatic memory management. It supports multiple programming paradigms, including object oriented, imperative, functional and procedural, and has a large and comprehensive standard library. Python interpreters are available for many operating systems. C Python, the reference implementation of Python, is open source software and has a community-based development model, as do nearly all of its variant implementations.

VII. EXPERIMENTAL RESULTS



Fig.6 Hardware

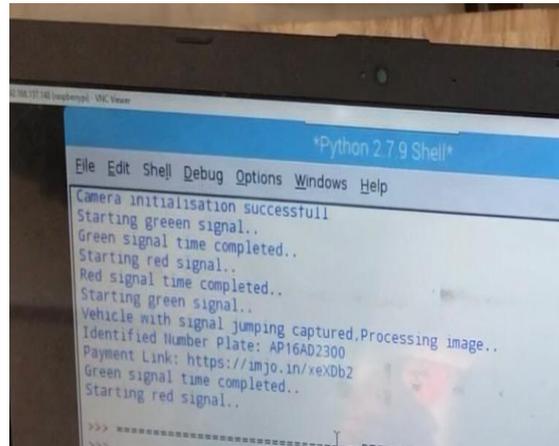


Fig 7 execution of output

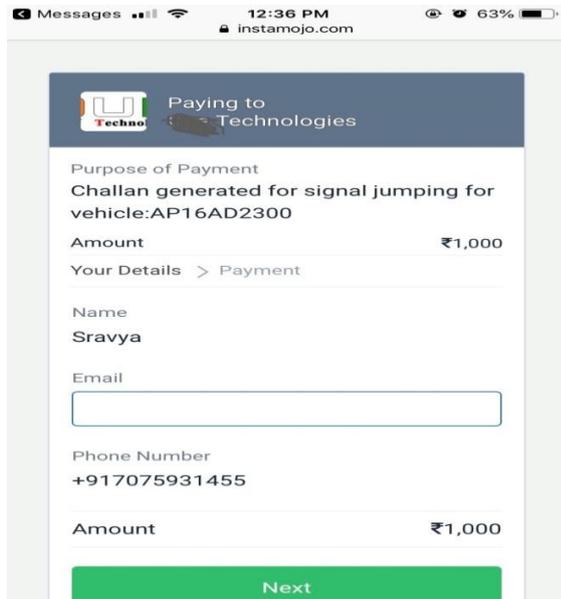


Fig 8 SMS sent to owner

VIII. RESULTS

First install the raspberry Pi setup in our laptops then to connect the raspberry Pi to laptop using power supply cable and USB cable. The USB web camera is connected to the raspberry Pi. Then to install the VNC viewer in our laptops then open the terminal to write the commands for capturing the image using webcam. Then open the python programming to write the code for recording the video using webcam. The webcam is placed at the traffic a signal the red signal is on the camera is on automatically. If any one crosses there signal then automatically record the video using webcam. The all information is send to the cloud using raspberry Pi. To extract the vehicle number plates to the video recorded. Then to send fine the message to the vehicle owner and near the traffic police. Alcohol sensor is placed in front of the car streamer. The threshold value is above 65 then automatically car engine is stopped. The raspberry pi takes signals as an input from the sensor elements and make the decisions a boutthe vehicle and can stop the vehicle ignition if required as the capability to stop the ignition. The result s are observed and to check the process it will be working correctly are not in this module.

IX. CONCLUSION

Hence in this paper a device has proposed and to implement the traffic rules and to reduce the accidents occurring in the traffic and this also checks the driver condition and position inthe car reduce the number of road accidents that are occurring due to drunken driving.

REFERENCES

1. Qadri, Muhammad Tahir, and Muhammad Asif."Automatic number plate recognition system for vehicle identification using optical character recognition."Education Technology and Computer, 2009. ICETC'09. International Conferenceon. IEEE, 2009.
2. Surendar E, Thomas V.M, PosoniaA.M , "Animal tracking using background subtraction on multithre s hold segmentation ", Proceedings of IEEE Internationa IConferenceonCircuit, Power and Computing Technologies ,ICCPCT, 2016.
3. Supraja A, Bhanu Sri, "DrunkanddrivedetectionusingIOT" ,International Journal of Pure and Applied Mathematics,Volume 118 No. 20 2018, 4303-4307.

4. Elizabeth Basil,Prof.S.D.Sawant, " IoT based TrafficLight Control SystemusingRaspberry Pi ",International Conferenceon Energy, Communication, Data Analyticsand Soft Computing(ICECDS-2017).
5. Ayush Agarwal, "Licenceplaterecognition for remotemonitioing of traffic",International Journal of Industrial Electronics and Electrical Engineering,ISSN: 2347-6982.
6. Ren Zhengang, Design of Electronic toll collection system in Expressway Based on RFID," IEEE International Conference on Environmental Science and Information Application Technology, whhan China, 4-5 July 2009.
7. Gisu Heo, "Extraction of Car License Plate Regions using Line grouping and density methods," IEEE International Symposium on Information Technology Convergence (ISITC 2007).
8. Dongjin Park, "Vehicle Plate Detection in Car Black Box Video," Department of Embeded System Engineering, Incheon National University, Incheon, Republic of Korea, 28 November 2017.
9. C.V. KeerthiLatha, "License Plate Extraction of Images using Raspberry PI", IEEE International Journal of Advanced Research in Computer Engineering & Technology volume 4 Issue, 1 January 2015.
10. Rinky Sharma, "Automatic License Plate based smart Vehicle Validation and Security by Gate Control & Email Send", IEEE International Journal of Computer Science and Information Technologies, volume 6,2015.
11. Prof. B.H. Pansambal, "Traffic Monitoring System by Registration Number Identification", IEEE International Engineering Research Journal(IERJ), volume 2 Issue 9, 20 June 2017.