



A Smart Access Control for Restricted Buildings Using Vehicle Number Plates Recognition System

¹ K. Sagar, ² R. Venu Prakash, ³ P. Vijay Kumar Reddy

^{1,2,3}Department of ECE, Madanapalle Institute of Technology and Science, Andhra Pradesh, India.
E-mail: ¹18699A0483@mits.ac.in. ²18699A04A3@mits.ac.in. ³18699A04A5@mits.ac.in.

ABSTRACT:

The expanded security worries in hotels, government offices and business structures require identifying entering vehicles and controlling admittance to these offices. The platform is computerized with tag acknowledgment based on images of vehicles. In any case, in circumstances where standardized plates are not utilized, picture-based acknowledgment. Permit plate, police and foundation twisting. Customarily human beings finish this work, and guardians need to remain alert for long hours, check vehicles entering to the office and physically keep data about those vehicles. This dreary and wasteful process demands unreasonable energy from security faculty and creates inconveniences and potentially security proviso in these premises. To beat these weaknesses, this work proposes a prototype plan for a programmed entryway access controlling system which examines the vehicle plate numbers utilizing a camera and optical acknowledgment calculation and contrasts it and the records put away in the data set to choose whether to permit the vehicle or not. The specialists fostered this model plan utilizing a Raspberry associated with a pi camera and a servo engine, Python was likewise utilized as an improvement device. The framework was successfully tested and demonstrated to be a practical answer for the issue characterized.

INTRODUCTION

Inside the rapid making nations, the number of vehicles is developing bit by bit. In agreed with this, they ought to see the vehicles and their award plates are expanding. To supply this need, PC based adjusted vehicle label affirmation structure are being made of late. In this consider, an able Automatic vehicle label affirmation System considering Artificial Neural Systems (ANS) was proposed. This system includes three huge subjects. These are; binding the plate region from the vehicle picture, partitioning the characters from the label picture and seeing the isolated characters. [1]. after these taking care of the optical individual affirmation checks from the data base if the plate is enlisted, the entrance normally gets open without human affiliation. Action control and vehicle owner noticeable verification has changed into a basic issue in every country. A piece of the time it becomes testing to detach vehicle owner who harms action rules and drives unnecessarily speedy. In this manner, it is unfathomable to hope to get and repulse such people since the improvement individual probably won't have the decision to recuperate the vehicle number from the moving vehicle because of the speed of the vehicle. As such, there is a need to make an Automatic Number Plate Recognition (ANPR) System [2]. Tweaked mark confirmation (ALPR) has a significant impact in different genuine applications, for example, changed cost mix, travel rule support, halting group gain to effect, and road improvement checking. ALPR sees a vehicle's mark number from an image or pictures taken by one or the other grouping, dull or white, or infrared camera. It is fulfilled by the mix of a great deal of structures. For example, object ID, picture dealing with, plate district, dividing the characters, consolidate disposing of and plate insistence [3- 23]. ALPR is moreover known as altered vehicle prominent check, vehicle plate insistence, tweaked number plate certification, and optical individual confirmation (OCR) for vehicles. In this paper presents vehicle number plates confirmation structure and the other area will be examined related work and approach of proposed framework followed by the finding of the proposed framework.

Mechanization is the most often spelled term in the field of contraptions. Considering computerization, unsettling has happened in the continuous advances. This paper utilizes a presented PC, which is ordinarily named as Raspberry Pi2 processor. It goes about as heart of the undertaking.

INTRODUCTION TO EMBEDDED SYSTEMS

APPLICATION AREAS

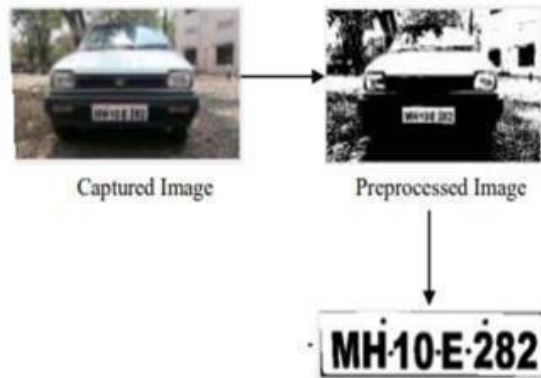
Around 99 for each penny of the processors made breeze up in presented frameworks. The presented framework publicize is a champion among the most shocking progression zones as these designs are utilized as a piece of particularly grandstand segment purchaser gear, office mechanization, flow computerization, biomedical structure, distant correspondence, information correspondence, media exchanges, transportation, military, etc.

Consumer appliances:

At home we use different embedded structures which fuse automated camera, propelled diary, DVD player, electronic toys, microwave stove, remote controls for TV and air circulation and cooling framework, VCO player, PC diversion supports, video recorders et cetera. The present bleeding edge auto has around 20 embedded structures for transmission control, engine begin control, ventilating, course et cetera. Surely, even wristwatches are directly getting the opportunity to be particularly introduced structures. The palmtops are proficient embedded structures using which we can do numerous extensively valuable endeavors, for instance, playing beguilements and word getting ready.

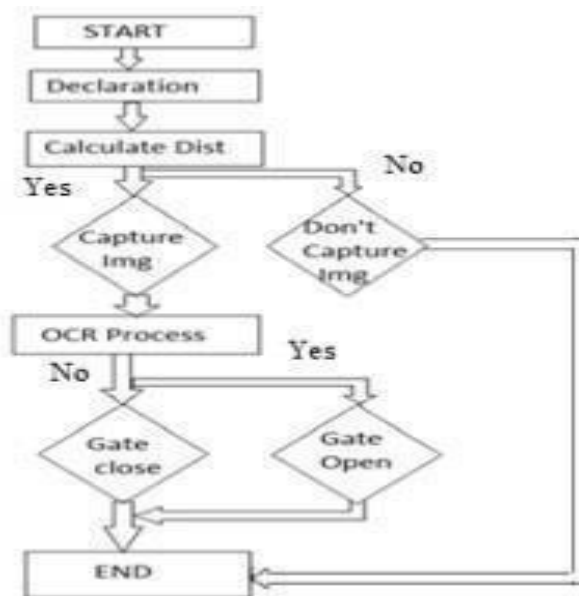
PROPOSED SYSTEM

To beat these weaknesses, this work proposes a model plan for a programmed door access controlling framework which filters the vehicle plate numbers utilizing a camera and optical acknowledgment calculation and contrasts it and the records put away in the data set to choose whether to permit the vehicle or not. The specialists fostered this model plan utilizing a raspberry associated with a pi camera and a servo engine, Python was likewise utilized as an improvement device. The framework was effectively tried and demonstrated to be a feasible answer for the issue characterized.



DVD player, electronic toys, microwave stove, remote controls for TV and air circulation and cooling framework, VCO player, PC diversion supports, video recorders et cetera. The present bleeding edge auto has around 20 embedded structures for transmission control, engine begin control, ventilating, course et cetera. Surely, even wristwatches are directly getting the opportunity to be particularly introduced structures. The palmtops are proficient embedded structures using which we can do numerous extensively valuable endeavors, for instance, playing beguilements and word getting ready.

3.1 WORKING



Above figure shows that the block graph of acknowledgment of vehicle number plate utilizing Raspberry pi. In this framework Raspberry pi 3 is the core of task and we have introduced Linux working framework some significant library and bundles have introduced to change picture over completely to message like OpenCV OCR. Raspberry pi is SoC gadget. Here we interface camera to Raspberry pi on a port where we interface camera. The camera is performing fundamental job in this framework. At the point when vehicle comes in range with ultrasonic sensor consequently the picture of number plate gets catch and converts into text utilizing OCR and open CV. Then analyze the text into leaving number plate. Assuming number plate gets match servo engine opens the door else close the entryway. administrator that vehicle is obscure. Figure3.5 shows the execution of acknowledgment of vehicle number plate utilizing Raspberry pi.

HARDWARE REQUIREMENTS

Ultrasonic sensor with raspberry pi

Sound comprises of wavering waves through a medium (like air) with the still up in the air by the closeness of those waves to one another, characterized as the recurrence. Just a portion of the sound range (the scope of sound wave frequencies) is discernible to the human ear, characterized as the "Acoustic" range. Extremely low recurrence sound beneath Acoustic is characterized as "Infrasound", with high recurrence sounds above, called "Ultrasound". Ultrasonic sensors are intended to detect object nearness or reach utilizing ultrasound reflection, like radar, to compute the time it takes to reflect ultrasound waves between the sensor and a strong article. Ultrasound is mostly utilized in light of the fact that it's quiet to the human ear and is moderately exact inside brief distances. You could obviously involve Acoustic sound for this reason, yet you would have a loud robot, blaring like clockwork. .

An essential ultrasonic sensor comprises of at a collector, and a control circuit. The transmitters emanate a high recurrence ultrasonic sound, which skip off any close by strong items. A portion of that ultrasonic commotion is reflected and distinguished by the beneficiary on the sensor. That return signal is then handled by the control circuit to compute the time contrast between the sign being communicated and gotten. This time can thusly be utilized, alongside some astute math, to ascertain the distance between the sensor and the reflecting article.

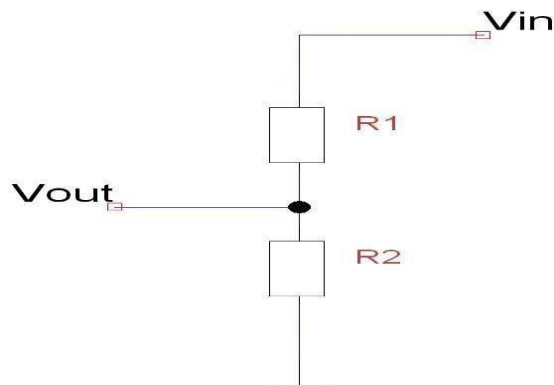


Figure 3: Facial Feature Extraction

The sensor yield signal (ECHO) on the HC- SR04 is appraised at 5V. Nonetheless, the info nail to the Raspberry Pi GPIO is evaluated at 3.3V. Conveying a 5V message into that unprotected 3.3V info port could harm your GPIO pins, which is something we need to stay away from! We'll have to utilize a little voltage divider circuit, comprising of two resistors, to bring down the sensor yield voltage to something our Raspberry Pi can deal with.

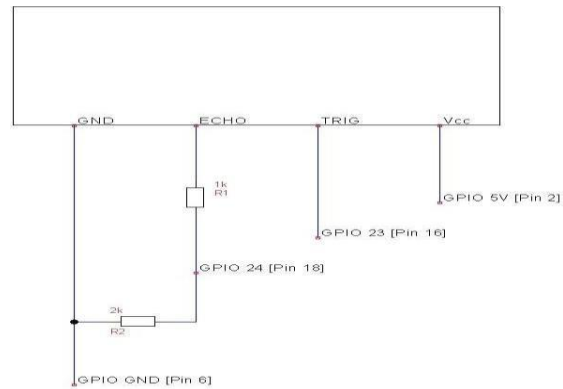
Voltage Dividers

A voltage divider comprises of two resistors (R1 and R2) in series associated with an info voltage (V_{in}), which needs to be reduced to our output voltage (V_{out}). In our circuit, V_{in} will be ECHO, which needs to be decreased from 5V to our V_{out} of 3.3V.

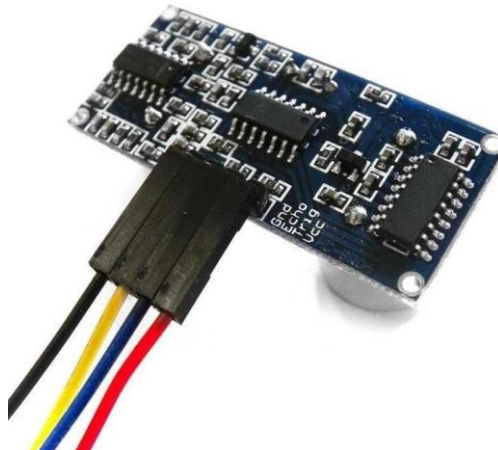


Assemble the Circuit

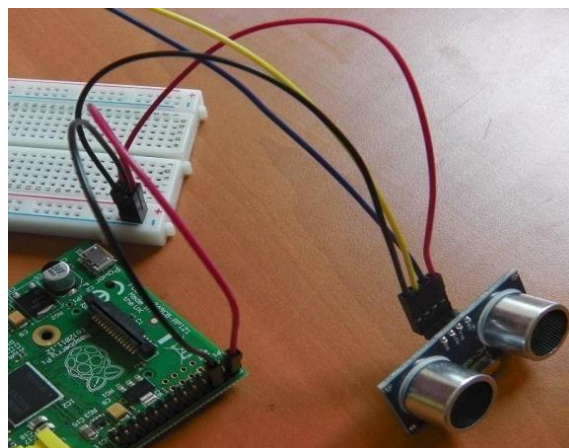
We'll be using four pins on the Raspberry Pi for this project: GPIO 5V [Pin 2]; Vcc (5V Power), GPIO GND [Pin 6]; GND (0V Ground), GPIO 23 [Pin 16]; TRIG (GPIO Output) and GPIO 24 [Pin 18]; ECHO (GPIO Input)



1. Plug four of your males to female jumper wires into the pins on the HC-SR04 as follows:
Red; Vcc, Blue; TRIG, Yellow; ECHO and Black; GND.



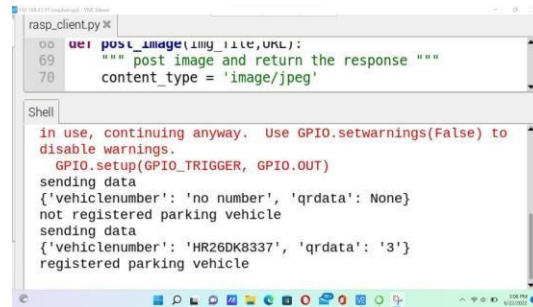
1. Plug Vcc into the positive rail of your breadboard, and plug GND into your negative rail.
2. Plug GPIO 5V [Pin 2] into the positive rail, and GPIO GND [Pin 6] into the negative rail.



3. Plug TRIG into a blank rail, and plug that rail into GPIO 23 [Pin 16]. (You can plug TRIG directly into GPIO 23 if you want). I personally just like to do everything on a breadboard!
4. Plug ECHO into a blank rail, link another blank rail using R1 (1kΩ resistor)
5. Link your R1 rail with the GND rail using R2 (2kΩ resistor). Leave a space between the two resistors.

II RESULT

Vehicle Number plate detection through web camera



```

rasp_client.py
00 def post_image(img_file,url):
69     """ post image and return the response """
70     content_type = 'image/jpeg'

Shell
In use, continuing anyway. Use GPIO.setwarnings(False) to
disable warnings.
GPIO.setup(GPIO_TRIGGER, GPIO.OUT)
sending data
{'vehiclenumber': 'no number', 'qrdata': None}
not registered parking vehicle
sending data
{'vehiclenumber': 'HR26DK8337', 'qrdata': '3'}
registered parking vehicle
  
```

Registration of Vehicle Status

Detected Car QR code



V1 CONCLUSION

The performances of the system make it a valid choice among its competitors especially in those situations when the cost of the application has to be maintained at reasonable levels. This paper is helpful for the identification and detection of vehicle number plate. Here the focus is given to detect position of the characters and it can be done by using OCR technique. There are several approaches taken to achieve this. In future, the cloud computing can be used, which will be very helpful for storing the data permanently. For future upgrade, hence in this paper a gadget has proposed and to execute the traffic rules and to diminish the mishaps happening in the rush hour gridlock and this likewise checks the driver condition and position in the vehicle lessen the quantity of street mishaps that are happening because of plastered driving.



REFERENCES

1. 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.
2. Gisu Hoe, "Extraction of Car License Plate Regions using Line grouping and density methods," IEEE International Symposium on Information Technology Convergence (ISITC 2007).
3. Dongjin Park, "Vehicle Plate Detection in Car Black Box Video," Department of Embedded System Engineering, Incheon National University, Incheon, Republic of Korea, 28 November 2017
4. Aishwarya Agarwal, "Automatic License Plate Recognition using Raspberry Pi, "I EEE International Interdisciplinary Conference on Science Technology Engineering Management Singapore, 22nd, 23rd April 2017.
5. KumthekarA.V1,Ms.SayaliO whal, Ms.SnehalSupekar and BhagyashriTupe,"Recognition Of Vehicle Number Plate Using Raspberry Pi" International Research Journal of Engineering and Technology (IRJET),Volume: 05 Issue: 04.