

## AUTOMATIC NO PARKING FINE SYSTEM

Dr. K. Madhusudan\*<sup>1</sup>, K. Yogesh\*<sup>2</sup>, M.S. Yamini\*<sup>3</sup>,  
P. Venkat Pradeep Krishna\*<sup>4</sup>, R.V. Yaswanth\*<sup>5</sup>

\*<sup>1</sup>Professor Department Of Electronics And Communication Engineering Siddharth Institute Of Engineering And Technology (Autonomous), Puttur-517583, Andhra Pradesh, India.

\*<sup>2,3,4,5</sup>Department Of Electronics & Communication Engineering Siddharth Institute Of Engineering And Technology (Autonomous), Puttur-517583, Andhra Pradesh, India.

### ABSTRACT

Now a day's vehicle traffic has become a major part of our daily lives because of the increase in the population. So here we are proposing a system that prevents unauthorized vehicle parking in public places such as offices, and educational institutes and is helpful for the proper management of vehicles. We are designing an Automatic no parking Fine system that automatically captures the number plate of the vehicles which are parked in no parking area. The image is processed using python and the number plate text is extracted. The extracted text is stored and sent to the Firebase. The extracted text is verified with the details in the Firebase. If any match is found a fine receipt will be generated on the particular vehicle number and sent an Email to the respective vehicle owner. More people are parking their vehicles in no-parking zones as this becomes the major cause reason traffic and also causes accidents. Although traffic police are imposing fines on no parking all the time they are not available. So we designed this project for controlling the people to follow the rules mostly in no parking areas. In this project, we are scanning the vehicle number plate through the camera by image processing when a vehicle enters the no parking area then the system finds the details which are stored in firebase by using python. It generates the fine receipt and that receipt is sent to a specified Email-id which is linked to the vehicle registration number.

**Keywords:** No Parking, IFTTT Web Page, Mobile Net SSD Datasets, Free OCR Webpage, Open CV.

### I. INTRODUCTION

A revolution has occurred in existing technologies due to Automation. In the area of electronics and intelligent systems Automation is the frequent term used. Due to several applications identifying the vehicles has become very important; for example, vehicle document verification, traffic surveillance, theft control, access control, parking fees, ticket issuing, toll payments, etc.

For several decades' modern automation system and intelligent transportation system has been widely used as research for identifying vehicles' number plate using automatic recognition techniques. The techniques of automatic recognition are the same even though the format of license plates differs in many countries. (Detection, segmentation, and character recognition). The most important task is to detect the license plate and the probability which greatly affects the accuracy of recognition using the three key automatic recognition techniques. There are some widely accepted and popular edge-based methods. Character segmentation is the second task after detection. According to height and width, captured characters are segmented. Plate number recognition uses the projection method which is believed as the most effective method of character segmentation. The license plate is separated into blocks. The other methods to achieve this are; template matching, corner detection algorithm, Neural Networks, etc.

Cloud Storage is a backend service & that provides seamless scalability and deletes the necessity of operating firebases that are distributed in nature. Internet-scale applications uses specifically designed fully and fast managed services. Internet-based applications can use cloud storage as it has real-time notification features.

In this project, we are going to send an email via the IFTTT webpage using raspberry pi. IFTTT works by starting a session between the user and server.

### II. LITERATURE SURVEY

[1] Detection of Vehicle Number plate using Raspberry pi:

Number Plate Recognition is a type of security system. Number plate recognition uses Image Processing Concepts. OCR (Optical Character Recognition) can be used to read the image of the vehicle number plate. The

Number Plate Recognition system has many applications like toll gate opens the gate for the vehicle only when the number plate is successfully detected and the pay slip is generated. This system is also used for parking the vehicles orderly by the parking authorities. The first step of this system is it reads the vehicle number plate and observe each and every character for perfection.

The most important part is OCR, where the letters are changed into texts that can be decoded later. In this paper, a full algorithm and network flow for ANPR and its applications are shown.

[2] Speed Detection for Intelligent Transportation System and plate recognition:

An enormous number of vehicles around us in everyday life makes aggravations like hefty traffic, taking of vehicles at the spots like cost courts, leaving regions, substantial traffic streets. The mode of vehicle transportation is a drawn-out and tedious undertaking on the off chance that it is totally done physically and which brings about tremendous blunders and blame. In this way, we propose a recognition system using an image processing technique. The image processing steps of OCR-based segmentation are used for number plate extraction. The corresponding number matched with the database and a security alert send in case of any theft happened.

[3] Privacy leakage in smart homes and its mitigation:

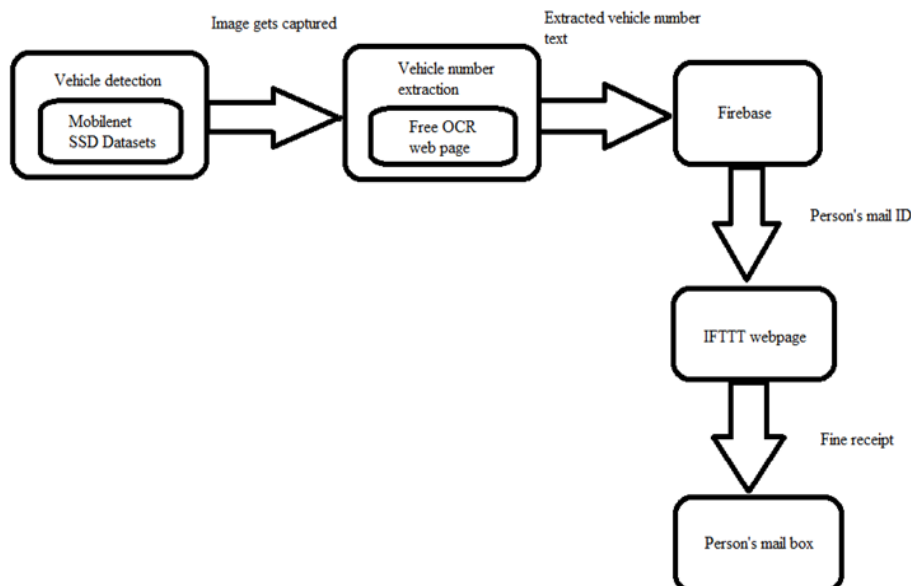
The combination of the smart home and the technology now that is rapidly increasing brings more ideas to the users. Also, it's very important to maintain privacy. We can set the application to a daily routine so that it can know the day and night of a user. In this paper, we have given an explanation of how IFTTT works in many ways in our day-to-day life. We propose the privacy of users in two steps. First, filter the unwanted events and the value of events that must be uploaded.

### III. PROPOSED SYSTEM

In our system, we are using open CV with Mobile net SSD Datasets for vehicle detection in no parking areas. By using these two algorithms the image gets captured. And then to extract the text of the vehicle plate number from the image captured we use the free OCR (Optical Character Recognition) webpage. After this process, the extracted number plate text matches the data available in the firebase. If any match is found then we extract the personal details of the particular vehicle owner like name, phone number, mail id, etc. And we generate a fine receipt with some fine amount and send it to the respective vehicle owner via mail id by using IFTTT (If This Then That) webpage. IFTTT uses applets which has one trigger and one action. So it's a simple online mail transferring method that uses "If This happens Then That happens."

### IV. SYSTEM ARCHITECTURE

In this system we are using Raspberry Pi 4 Model B, PI Camera, SD Card, Power supply and touch display as the hardware components.



**Fig:** System architecture block diagram

#### **A. Raspberry Pi 4 Model B**

The raspberry pi 4B is a new development in the small-sized computer. This raspberry pi has an upgrade that is ARM Cortex A72 4x 1.5 GHz quad-core processor. Due to this it has so many applications like it uses wireless Bluetooth, hard drive interface is USB-C, has a single board, 1.5 GHz speed, 8 GB Memory, and has HDMI video port.

#### **B. Pi Camera**

It is a portable lightweight camera used for Raspberry Pi is known as a Pi camera. It uses MIPI (Mobile Industry Processor Interface) it communicates with the Raspberry Pi. Image processing, machine learning, and surveillance also use PI cameras. It is widely used in drones because the payload of cameras is very less. Apart from these, PI Camera can also be used with normal computers such as webcams.

#### **C. SD Card**

It is a type of memory card used in cameras and other portable devices. SD card has high standards that make manufacturers tough to make high-performance products. A lot of people uses their mobile phone to take pictures, record videos, and for saving data. According to the industry standards, SD cards are used in many market sections of the portable storage industry, in many electronic devices like books, printers, MP3 players, navigation systems, etc.

Also, in this system, we are using Raspbian Operating System, Thonny Python Editor, and also some python libraries.

#### **D. Raspbian Operating System**

Raspbian is an open-source and free operating system based on Debian optimized for the Raspberry Pi hardware. Raspberry Pi can also run using the basic set of programs and utilities that this operating system has. However, Raspbian provides more than a pure Operating System: it has around 35,000 packages, and pre-compiled software bundled for easy installation on your Raspberry Pi.

The first build of the Raspbian packages optimized for the best performance of the Raspberry Pi was completed in June of 2012. Raspbian is trying to achieve the stability and performance of as many Debian packages.

#### **E. Touch Screen Display**

The Raspberry Pi touch display is an LCD display and it uses a DSI connector to connect with the Raspberry Pi. Sometimes, we can use both LCD and HDMI displays. Raspberry Pi has two modes they are KMS and FKMS. The display size is 7 inches and the display format is 800\*480 pixels. It also has an active area of 154.08mm\*85.92mm.

#### **F. Thonny Python Editor**

Thonny is a python editor that is very simple to understand and install. It has many features such as variables, etc. It is used to evaluate the expression step-wise. It highlights the errors if any. It is a friendly system and easy to complete the code. It can work in macOS, Linux, and Windows. It can be used in Raspberry Pi.

#### **G. Python**

Python is a high-level programming language. It has rich built-in data structures, which have both dynamic binding and dynamic typing making it attractive in the rapid development of applications. It can also be used as a scripting language for combining components together. Python is simple and easy to learn. Python has syntax readability which makes less cost maintenance. Python has a wide range of packages and modules so that the user can perform code reusability. Also one of the major important points is that python is a free open source, which you can download and use from its official website. Programmers usually love python because of the vast options it provides for the comfortable making of the code.

#### **H. Python Libraries**

Generally, python provides a very large number of modules, packages, and libraries with ease of use. In this project we are going to use some of the python libraries i.e.; OpenCV, Requests, I/O, JSON, Firebase, Diff lib, and Datetime.

#### **I. Mobile net SSD Datasets**

It is used to detect the objects in the given image. After detecting the presence of the vehicle in the no parking area it captures the image of the vehicle.

**J. OCR Webpage**

Optical Character Recognition is used to convert images captured into machine text. This free OCR webpage process is widely used in number plate recognition, traffic sign recognition, Google books, pen computing, etc. There are so many types of OCR they are OWR, ICR, and IWR.

**K. IFTTT webpage**

IFTTT (If This Then That) webpage is an online mail transferring protocol that is used to send the fine receipt via mail to the respective vehicle owner of the vehicle that is parked in the no parking area.

**V. APPLICATIONS**

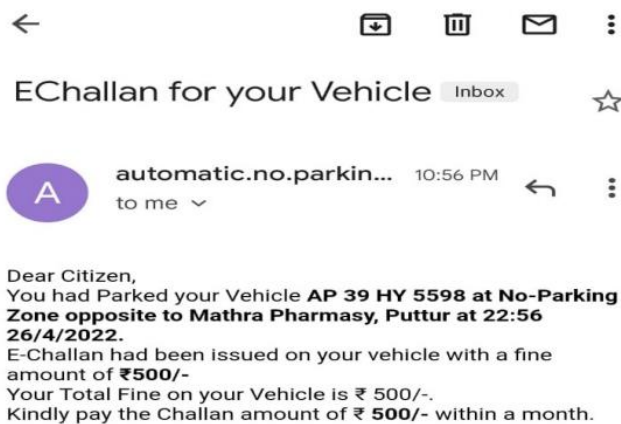
- This system can be used in public places like Educational Institutions, offices, etc.
- To reduce traffic on one-way roads.
- It can also be used in no-parking zones which will be simultaneously helpful for decreasing the traffic.
- This system can be used in shopping mall parking areas.

**VI. RESULT**

- When a vehicle is parked or stopped in restricted or no parking zones, then our system automatically takes a snapshot of the vehicle.
- It processes the image and gives vehicle number text, with the person's email id.
- And generates the fine receipt, sends to the owner of the vehicle through email.



**Fig: Vehicle in no parking region**



**Fig: Fine receipt through mail**

**VII. CONCLUSION**

The proposed technique will reduce the need of man power for monitoring and security applications. By making use of this technique there will be no need of physical presence of humans at the no parking area and there will be no need to take action against illegally parked vehicles. This technique makes easy for the authority to take action against the vehicle owner and impose a fine. Automatic no parking fine system is use

for controlling the traffic in the roads and making less burden to the traffic police. It creates awareness in the public that proper management of vehicle parking is important. The applications of this fine system are One-way roads, Offices, Educational institutes and heavy traffic roads. Due to this the traffic will also get reduced and public can do their daily activities without any delay. Due to this less traffic, emergency situations can also be handled accordingly.

### VIII. REFERENCES

- [1] L. Sommer, N. Schmidt, A. Schumann and J. Beyerer, "Search Area Reduction Fast-RCNN for Fast Vehicle Detection in Large Aerial Imagery," 2018 25th IEEE International Conference on Image Processing (ICIP), 2018, pp. 3054-3058, doi: 10.1109/ICIP.2018.8451189.
- [2] A. O. Agbeyangi, O. A. Alashiri and A. E. Otunuga, "Automatic Identification of Vehicle Plate Number using Raspberry Pi," 2020 International Conference in Mathematics, Computer Engineering and Computer Science (ICMCECS), 2020, pp. 1-4, doi: 10.1109/ICMCECS47690.2020.246983.
- [3] R. Sureswaran, H. A. Bazar, O. Abouabdalla, A. M. Manasrah and H. El-Taj, "Active email system SMTP protocol monitoring algorithm," 2009 2nd IEEE International Conference on Broadband Network & Multimedia Technology, 2009, pp. 257-260, doi: 10.1109/ICBNMT.2009.5348490.
- [4] Yim, J., Cadiente, R. A., Mayuga, G. P., & Magsino, E. R. (2020). Integrated Plate Recognition and Speed Detection for Intelligent Transportation Systems. 2020 IEEE 10th Symposium on Computer Applications & Industrial Electronics (ISCAIE)
- [5] R.C. Gonzalez and R.E. Woods, Digital Image Processing, Third Edition, Prentice Hall Inc., 2008.
- [6] C.N.Anagnostopoulos, I.Anagnostopoulos, I.Psoroulas, V.Loumos and E. Kayafas License plate recognition from still images and video sequences: a survey, IEEE Transactions on Intelligent Transportation Systems, Vol. 9, 2008, pp. 377-391 .
- [7] Ye and D. Doormen, "Text detection and recognition in imagery : A survey," IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 37, no. 7, pp. 1480–1500, July 2015.
- [8] Nguwi, Y. Y., & Lim, W. J. (2015). Number plate recognition in noisy image. 2015 8th International Congress on Image and Signal Processing (CISP).
- [9] Uang, S., Xu, H., Xia, X., & Zhang, Y. (2018). End-to-End Vessel Plate Number Detection and Recognition Using Deep Convolution Neural Networks and LSTMs. 2018 11th International Symposium on Computational Intelligence and Design (ISCID).
- [10] In, C.-H., & Wu, C.-H. (2019). A Lightweight, High-performance Multi-Angle License Plate Recognition Model. 2019 International Conference on Advanced Mechatronic Systems (ICAMEchS).