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ijircce@gmail.com



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# Automatic License Plate Recognition System

Nagolu Koteswar Reddy<sup>1</sup>, Dr.Vishal C<sup>2</sup>

Student, Department of Master of Computer Applications, RV College of Engineering®, Bangalore, India<sup>1</sup>

Assistant Professor, Department of Master of Computer Applications, RV College of Engineering®, Bangalore, India<sup>2</sup>

**ABSTRACT:** Automatic License Plate Recognition: is about a automatic system can do automatic recognition of number plate using the image of vehicle. It is very smart & easy to use application. Just upload the image of vehicle, it will automatically recognize the number plate from the image, after that it will recognize the license plate and give it in text format. It will store it in storage. Technology is playing a very vital role in changing our life in many ways. There are many sectors which benefited after implementing technology in it. The outcome of the Automatic License Plate Recognition system is after uploading the image it will segment the characters and show convert the image to text and show the recognized number plate with the saving the test results and showing that results in the database.

**KEYWORDS:** OpenCV, Tkinter, Python, Pycharm IDE.

## I. INTRODUCTION

The ALPR is an automatic system can do automatic recognition of number plate using the image of a vehicle. Just upload the image of vehicle, it will automatically recognize the number plate from the image, after that it will recognize the license plate and give it in text format. It will store it in storage.

Technology is playing a very vital role in changing our life in many ways. There are many sectors which benefited after implementing technology in it. Now it's time for robotics & IOT kind of management system. We have seen in our country, not even in country but in all over world day by day number of cars is increasing. And it's creating traffic & parking management issues. In current scenario, there is no proper facility of parking in our country. People park their car in area which whatever they like. There is no proper management for parking& traffic solutions. So, with this feature of ALPR, we can implement smart traffic & parking management system in future. So, this is the first step to start implementing smartness in traffic and parking. The purpose of building this project is to create a smart technology for future. We can see the cars are increasing day by day. It can create issues of accidents, crimes & traffic. Now our plan is that, we need a one smart system which can detect car number plate and recognize the number automatically. So, with this feature we can improve our traffic & parking solutions. Even we can prevent the crime also. It can automate the traffic & parking management in very smarter way.

In the current system, we have implemented Image uploader. You need to upload the image, It will automatically find the number plate from image, and it will automatically recognize the number plate and give it in a text format with cropped number plate image. From the live video, number plate detection work is pending. We are working on it. According to our study in Image detection accuracy is very well but camera position should be proper and camera should be HD (Good quality). Model accuracy will be depending on the image quality.

The objective of this study is application is the desktop application, it needs certain tools & technologies while developing the application. The main technology is associated is the LPR & OCR. We are using Python as a programming language. For the designing we are using Adobe XD, Star UML for diagrams. And for the development we are using the PyCharm.

The outcome of the Automatic License Plate Recognition system is after uploading the image it will segment the characters and show convert the image to text and show the recognized number plate with the saving the test results and showing that results in the database.

## II. LITERATURE SURVEY

Atul Patel et.al, [1] According to, the work done in Image Binarization, Edge Detection, Hough transform, Blob Detection for detection and Convolutional Neural Network for Character recognition. In higher Image resolution they are getting good accuracy. This approach is good for ANPR systems.

Vladimir Shapiro et.al, [2] In this Paper explained ANPR in another way which is totally based on image processing. They are using Image acquisition for taking input. After that they are converting image into BGR(Black & White) format for handling image in simple way. After that they are applying Image localization for image data extracting and at the end they are making blob for extracted numbers. This is very simple approach to understand.

S Rovetta et.al, [3] This paper explained ANPR in very different way. They extract number plate using Cascading then they applying image localization the resizing the image. Then they converting image into BGR. Then they are applying edge detection. Then applying character segmentation then in the end they are applying Optical Character Recognition in the end for extracting text.

Yuntao Cui et.al, [4] A vehicle license plate recognition system is an important proficiency that could be used for identification of engine vehicle all over the earth. It is valuable in numerous applications such as entrance admission, security, parking control, road traffic control, and speed control. However, the system only manages to identify the license number and needs an operator to control the collected data. Therefore, this paper proposes an automatic license plate recognition system by using the image processing and template matching approach.

Sobiernaski et.al, [5] Number Plate Recognition system is a security system. Image processing concept is used in Number Plate Recognition system. OCR (Optical Character Recognition) scheme is also applied in this for reading the image of vehicle number plate. Number Plate Recognition system is used for many purposes like tollway authorities uses this system for allowing the vehicle to enter the toll road by detecting their number plate automatically and provide them with pay-slip and then open the road for that particular car.

Shahid Mehmood et.al, [6] In this paper, License Plate recognition (LPR) system is a key to many traffic related applications such as road traffic monitoring or parking lots access control. This paper proposes an automatic license plate recognition system for Saudi Arabian license plates. The system presents an algorithm for the extraction of license plate and segmentation of characters. Recognition is done using template matching. However the proposed work seems to be the first attempt towards the recognition of Saudi Arabian license plates.

Christos Nikolas et.al, [7] Automatic number plate recognition (ANPR) is an image processing technology which uses number (license) plate to identify the vehicle. The objective is to design an efficient automatic authorized vehicle identification system by using the vehicle number plate. The system is implemented on the entrance for security control of a highly restricted area like military zones or area around top government offices e.g. Parliament, Supreme Court etc. The developed system first detects the vehicle and then captures the vehicle image. Vehicle number plate region is extracted using the image segmentation in an image. OCR technique is used for character recognition.

Ryoo Seungteak et.al, [8] ANPR provides solution in which the steps to run an efficient intelligent transport network might be taken. Owing to the rapid increase in vehicles it has become a requirement for traffic control management. ANPR's main goal is to track traffic and for the purpose of defense. Number plate recognition uses image processing techniques or OCR techniques and edge detection technology to detect characters on license plates. The model comprises of three modules which are module for car detection, module for license plate segmentation and module for recognition. Starting from auto robberies, violating traffic laws, to law enforcement administration, Image processing gave us a determination to put a stop to these violations. This review paper provided an examination of the different license plate recognition design implemented so far.

Jayaram K et.al, [9] Automatic recognition of car license plate number became a very important in our daily life because of the unlimited increase of cars and transportation systems which make it impossible to be fully managed and monitored by humans, examples are so many like traffic monitoring, tracking stolen cars, managing parking toll, red-light violation enforcement, border and customs checkpoints. This paper mainly introduces an Automatic Number Plate Recognition System (ANPR) using Morphological operations, Histogram manipulation and Edge detection Techniques for plate localization and characters segmentation. Artificial Neural Networks are used for character classification and recognition.

Punam K. Saha et.al, [10] Even with the presence of rules and regulations stipulated against this, violators are still on the increase. This work uses a Vehicle Plate Number Recognition (VNPR) system which is a real-time embedded system to automatically recognize license plate numbers. It provides an alternative means to VPNR using an open-source library known as openCV. The main aim of the system is to use image processing to identify vehicles violating traffic by their plate numbers. It consists of an IR sensor for detecting the vehicle.

### III. PROPOSED SYSTEM

The proposed methodology is to have implemented Image uploader. You need to upload the image, It will automatically find the number plate from image, and it will automatically recognize the number plate and give it in a text format with cropped number plate image. From the live video, number plate detection work is pending.

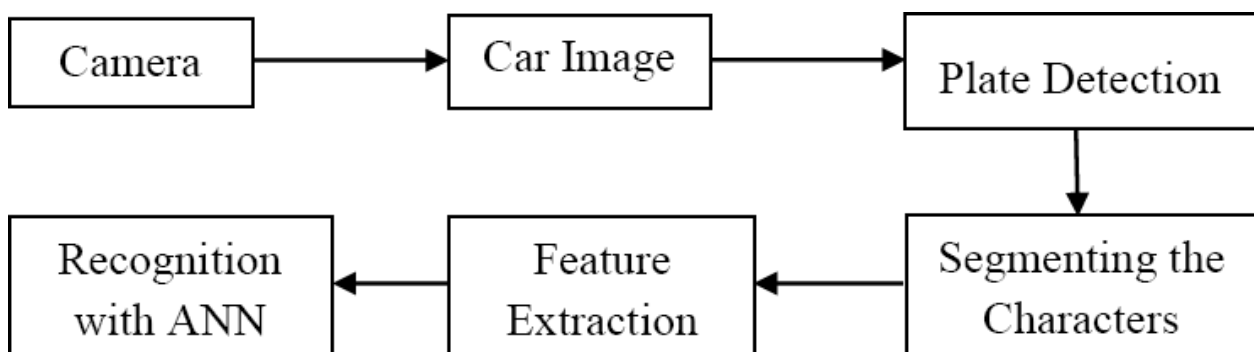


Fig 1: Architecture diagram of the proposed system

#### Module1: License Plate Detection

In this module, After the capturing image, it will find the license plate from that capture image, capture image should be front part or back part of the car and the condition is that number plate should be visible.

#### Module2: License Plate Cropping

In this module, After the detection of number plate from image, we need to crop the plate. Our system will automatically find the number plate & it will crop & save the image.

#### Module3: Optical Character Recognition

In this module, After the cropping of number plate, we will apply some image processing to our cropped number plate image, then we will send this image as a input of OCR engine. This task will be done automatically by our system.

### IV. CONCLUSION

The purpose of this research project was learn & implement real-time License Plate Recognition. We learn how to create the haar cascade and detect the object, usage of the OpenCV using Python. This project we have learn other things about image processing, GUI development using Tkinter, OCR implementation, Python programming language, UI creating, Adobe XD skills like creating the Design of the project & wireframe. And the main thing we have learn about UI handling & Database functionality.

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