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# **Number Plate Scanner**

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### ABSTRACT

Number Plate Scanner (NPS) helps to identify vehicle license plates in an efficient manner without the need for major human resources and has become more and more important the recent years. There are several reasons why their importance has increased. There are a growing number of cars on the roads and all of them have license plates. The rapid development in digital image processing technology has also made it possible to detect and identify license plates at a fast rate. The whole process may be done in less than 50ms. This gives 20 frames per second which is enough to process real-time video streams. Identification of vehicles is useful for many different operators. It can be used by government agencies to find cars that are involved in crime, look up if annual fees are paid or identify persons who violate the traffic rules. U.S., Japan, Germany, Italy, U.K and France are all countries that have successfully applied ALPR in their traffic management.

Keywords : Vehicle, License, Number Plate Scanner, Frames, Real Time.

### I. INTRODUCTION

The system allows the users to register the license plate number of their cars either through a mobile application or through SMS along with the parking time they want to pay for. If the parking attendant wants to check if a car has a valid parking ticket, the attendant must manually enter the license plate number to look it up in a database.

The ALPR system's task is to recognize the license plate from the image or video stream, look it up in a database and see if the license plate is valid. As ALPR has been such an important task to solve the last thirty years, a number of ALPR systems already exist with varying degree of accuracy and speed.

The complexity in recognizing license plates in the different test sets will significantly impact the accuracy making direct comparisons of the accuracy without considering the complexity meaningless.

Comparing the speed performance is easier, even though there are factors impacting it, especially the pixel resolution of the license plate images.



Fig 1.1 Number Plate

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#### **II. LITERATURE SURVEY**

- Anuja, P. N., 2011. License Plate Character Recognition System using Neural Network. International Journal of Computer Application. In this paper, Method for character recognition of license plate image based on two Neural Network techniques and two feature extraction approaches are proposed. It is observed that, as fan beam feature extraction method has more features for training the neural network thus its simulation accuracy is higher.
- AmrBadr et al. In this paper Automatic recognition of car license plate number got to be indispensible part in our day by day life. This paper mainly explains an Automatic Number Recognition System Plate (ANPR) using Morphological operations, Histogram manipulation and Edge discovery Techniques for plate localization and characters segmentation. Artificial Neural Networks are used for Character classification and recognition.
- Abd KadirMahamad In this paper they explained an automatic number plate inspection of letter sets of plate using image processing and optical character recognition. An imperative system has been created of training interface using LABVIEW software.
- Kuldeepak et al. In this paper, they introduced that high level of precision has been required by the number plate recognition when streets are occupied and number of vehicles are passing through. In this paper, by optimizing different parameters, they have accomplished an exactness of 98%. It is essential that for the tracking stolen vehicles and monitoring of vehicles of an exactness of 100% can't be bargained with. Therefore to accomplish better precision streamlining is required.



Fig 2-.1 Number Plate

#### **III. PROPOSED SYSTEM**

The main aim is to develop software that read the license plate content, recognize it, converts it into the text and displays in typed format. In the proposed system, the software takes the license plate in the form of pictures as an input and applies various concepts of machine learning and artificial intelligence such as deep learning, neural networks to identify and recognize the data from the user input and convert it into digitalized text format. Focuses on evaluating a person's position from the input picture. It is therefore necessary to choose the most appropriate object detection model to avoid any problems in the detection of individuals. 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.

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 resized 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).





Fig 3.1 Old Scanner reading cars

The most critical process in automated license plate recognition system is the license plate extractor. In this process, we apply different techniques on image to detect and extract license plate. This process is divided in two parts.

Number Plate Detection through Haar-like features In image processing techniques, Haar-like features[4] are used to recognize 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. Number 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.

This approach is quick and takes less execution time and memory with high a efficiency ratio. 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.

In the further part, 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.

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

## **IV. SYSTEM ARCHITECTURE**



Fig 4.1 System Architecture

The system should be developed in such a format that it should be able to get the license plate in the form of picture; this picture input can be in any format irrespective of jpg, jpeg or png. After this preprocessing of the image takes place in which the entire picture is divided into small sub pictures where each picture handles individual characters and reduces the noise of the picture and converts it into its ascii values.

Next step involves in reorganization and classification of the contents on license plate with the help of various machine learning techniques such as deep



learning neural networks etc. so that accurate identification of the input is done and the last step involves in displaying the image input which will be converted in digital text format.



Fig 4.2 Sequence Diagram

#### V. CONCLUSION AND FUTURE WORK

Automated License Plate recognition system is mainly aiming in converting license plate data into digital text format with the help of various machine learning concepts such as deep learning, neural networks etc. and converts it into digitalized text format. the first phase of the project involved in literature survey of the project identifying the methodology used to achieve the goal and it involved in giving a short presentation about the project to respective guides. Next phase involves in developing the software by writing the code in python3 with the help of APIs to meet the objective of the project and testing the efficiency and accuracy of the system.

Our approach allows the captured license plate to be passing and recognized in one forward pass and achieves high accuracy. We also prove the VGGNet in our case, deeper architecture network able to learn more discriminate feature which is robust to various illumination, rotation and distortions in the image, and lead to higher recognition accuracy.

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