

# License Plate Recognition using Color based Segmentation and Neural Networks

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**Abstract:** Number plate identification using image processing methodology is used for extracting and identify vehicle by reading through number plate. The existing system suffers from the problem of orientation of the text on the plate. If the systems are enriched with Number plate recognition of the vehicle for the last few days where the vehicle has been passed by, that may be of great interest while tracking the theft vehicle. The kind of information bank has been provisioned in the presented approach. Although many intensive research studies have been conducted in other countries in the area of license Plate identification to our knowledge. However, identification is an essential area in the development of intelligent traffic management systems and surveillance. Given the current security situation in the world due to various conflicts, this is one of the areas where there is an urgent need for the development of devices that could be used in variety of situations to ease the security concerns.

**Keywords:** APNR, Segmentation, k-means clustering, color segmentation.

## I. I INTRODUCTION

Number-plate recognition is a mass surveillance method that uses Hopfield Neural Network character recognition on images to read the license plates on vehicles. They can use existing closed-circuit television or road-rule enforcement cameras, or ones specifically designed for the task. They are used by various police forces and as a method of electronic toll collection on pay-per-use roads and cataloging the movements of traffic or individuals.

NPR can be used to store the images captured by the cameras as well as the text from the license plate, with some configurable to store a photograph of the driver. Systems commonly use infrared lighting to allow the camera to take the picture at any time of the day. ANPR technology tends to be region-specific, language specific, owing to plate variation from place to place.

Vehicle identification is a research area where image processing methods are used to identify vehicles by detecting and identifying the license plate numbers. Typical vehicle identification systems consist of three main stages. They are the identification and tracking of vehicles through motion, locating the license plate, and accurately identifying the numbers in the license plate.

Although many intensive research studies have been conducted in other countries in the area of automatic vehicle identification, to our knowledge, there is virtually no research studies conducted on some parts of the work.

## II. II RELATED WORK

**Jitendra Sharma et al (2014)** described a new methodology for 'License Plate Recognition' based on wavelet transform function. This proposed methodology compare with Correlation based method for detection of number plate. Empirical result shows that better performance in comparison of correlation based technique for number plate recognition. Here, it is modified the Matching Technique for number plate recognition by using Multi-Class RBF Neural Network Optimization. [1]  
**DIPALEE A. KOLTE1 et al (2014)** defined an new algorithm for clear image extraction from blurred image. From this improved image, licence plate region is recognized and plate is extracted .The character segmentation is performed on extracted licence plate and every single character is recognized by using two Neural network techniques: Back propagation artificial neural network(BP ANN), Learning vector quantization neural network(LVQ NN). [2]

**Seyed Hamidreza et al (2011)** Persian License Plate Detection and Recognition System is an image-processing technique used to identify a vehicle by its license plate. In fact this system is one kind of automatic inspection of transport, traffic and security systems and is of considerable interest because of its potential applications to areas such as automatic toll collection, traffic law enforcement and security control of restricted areas. [3]

**Rajesh Kannan Megalingam et al (2010)** proposed a system which is capable of extracting the license plate region from the vehicle's image taken from its rear end. The system consists of a digital camera, software to interface the camera with the software module and the software module which extracts and recognizes the license plate number. [4]

**Shyang-Lih Chang et al (2004)** Described Automatic license plate recognition (LPR) plays an important role in numerous applications and a number of proposed techniques. However, most of them worked under restricted conditions, such as fixed illumination, limited vehicle speed, designated routes, and stationary backgrounds. In this study, as few constraints as possible on the working environment are considered. [5]

**Zhihong Zhao et al (2008)** defined a new method was introduced in the Chinese license plate recognition. We propose a convolution neural network architecture designed to recognize license plate directly from pixel images with no preprocessing. We present the image transformation applied on the original license plate to increase the training database. We also provide experimental results to demonstrate the robustness of our approach and the recognition rate on the license plate and non-license plate testing set. [6]

### III. ALGORITHM

The vehicle's image captured on road is noisy and blur and therefore are required for noise and illumination

variations compensation during the task of identification of texts on the number plate. It is important to preserve the edges so that the number plate area is recovered and text identification algorithm may be confined to the bounding box.

In the existing system, the problem of zoom in or zoom out i.e. the size of the texts on RC plate due to image acquisition arises very frequently. Further, the system suffers from the problem of orientation of the text on the plate due to camera movement or vehicle side image capturing. If the systems are enriched with the information of the vehicle for the last 24 hours where the vehicle has been passed by, that may be of great interest while tracking the theft vehicle. This kind of information bank has been provisioned in the presented approach.

### Color Based Segmentation

Normally the number plate bears a white or yellow color as base color for private and commercial vehicles respectively. This information is used to extract the number plate from the rear body of the vehicle. This is done by segmenting the image based on color. K-means clustering is used for color based segmentation.

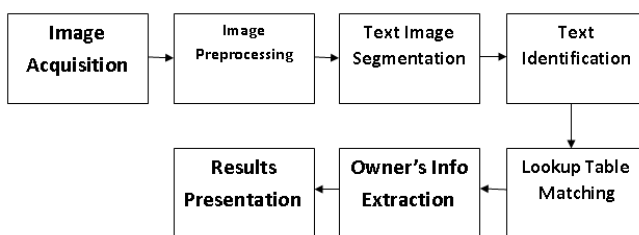
### IV. NEURAL NETWORK

A neural network is trained for identification of character segmented from the number plate. The neural network approach provides the flexibility of identifying the characters written in different font style. If the neural network is trained for different font style, then little fluctuation to some extent may be absorbed by the neural network algorithm and correct identification of text could be carried out.

Another important part regarding the textual information on number plate, the text style or font is not many times uniform on all plates. Therefore, the vehicle's no. plate identification system should be capable of identifying the texts written in any style and at any angular position. Even the size should not bother much.

The vehicles in India sometimes bare extra textual regions, such as owner's name, symbols, popular sayings and advertisement boards in addition to license plate. Situation insists for accurate discrimination of text class and fine aspect ratio analysis. In addition to this additional care taken up in the proposed work is to extract license plate of motorcycle (size of plate is small and double row plate), car (single as well as double row type), transport system such as bus, truck, (dirty plates) as well as multiple license plates present in an image frame under consideration.

Block Diagram of the Proposed System



## Conclusion

The presented studied work in identification of text from the number plate suffers from the draw back of same color of vehicles and number plate i.e. if the vehicle rear side is also of yellow in color and number plate is already in yellow. The main problem is to extract or localize the no. plate form the image irrespective of vehicle base color. This may be covered by using the derivative of color intensity on boundaries.

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