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# Automatic License Plate Recognition (ALPR)

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**Abstract :-** Automatic License Plate Recognition(ALPR) extraction of car's license number plate from an image and sequence of image. The extracted information can be used with database in system for traffic surveillance. The ALPR uses either a color, black and white or infrared camera to take images only in JEPG and PNG format. The quality of the acquired images is a major factor in success in ALPR.ALPR as a real life application has to quickly and successfully process license plate under different environmental condition, such as indoors, outdoors, day or night time. It should also be generalized to process license plates from different states. These plates usually contain different colors; some plates have a single color background and other have background images. The license plate can be partially occluded by dirt, lighting, and towing accessories on the car. In this paper, we present a comprehensive review of the maximum entropy algorithm for segmentation in ALPR.

**Keywords**: ALPR, ANPR,CPR, OCR

## I. INTRODUCTION

Automatic License plate recognition system play important role in real-Life such as parking lot a access control and road traffic monitoring, traffic low enhancement. ALPR system recognizes the number of car plate from an image and images and displays the owner's details. For that there are different techniques such as Otsu algorithm, maximum entropy, morphological operations, and so on. In ALPR we use edge detection algorithm for image extraction, morphological operation for clear image and maximum entropy for binaries of an image or number plate. To perform all this operation it is necessary to know some things related to the image they are as follows:

### 1.1. Plate variations:

a . Location: plates exist in different locations of an image.
b. Quality: image should be only in a JPEG and PNG format.
c. Font: plates only in standard format and in English language only.
d. Quantity: image has only one number plate.
e. Size: number plate should be ¼ of an image
f. Color: number plate is in only white and yellow background color.

### 1.2. Environment variations:

a. Illumination: input image may have different types of illumination, mainly due to environmental lighting and car headlights;

b.Background: The image background may contain pattern similar to number plates, such as number stamped on a car, number with vertical patterns, and texture floors. The image search has limitations of being based on text based queries.

There is no system which uses the maximum entropy, OCR, morphological operation. As combining this methods and technique in the system. The main objective of this paper is to identify the owner's details. The existing system is based on Otsu algorithm, but comparatively maximum entropy is best.

## II. LITERATURE REVIEW

From the number plate individual lines in the text are separated using line separation process to apply OCR and then OCR recognize the character from the text [1].The task of recognizing number plate for Indian conditions is considered, where license plate standards are rarely followed d[2].Segmentation using the maximum entropy technique convert the image given gray scale to binary image[3].Threshold method used in maximum entropy. Concept of thresholding for image segmentation that yields all the pixels and assumes the algorithm in two cases; darkness and brightness.

## III. SYSTEM ARCHITECTURE

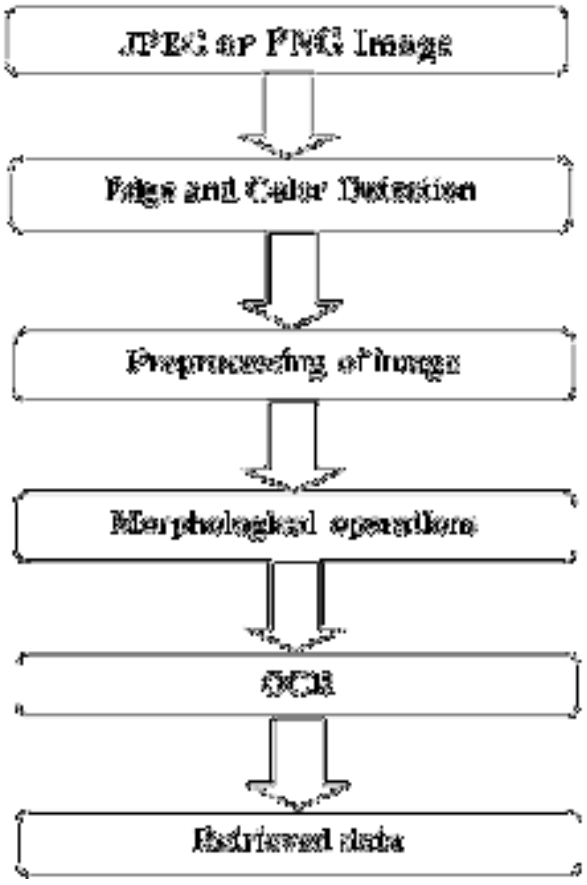


**Fig1.Steps of automatic license plate recognition software model.**

Step1: Capture the image. Image will be in JPEG or PNG form and the minimum 8 MP camera [7].

Step2: Extract the number plate region from the given image using edge detection.

Step3: In this step extracted portion of the image is converted into gray scale then gray scale is converted into binary image.

Step4: On the binary image of a extracted portion we apply morphological operation and this operation contain dilation and erosion.

Step5: OCR extracts the character string from the given image and it transfer this to the server.

Step6: After comparison it retrieves data associated with that number.

## IV. METHODOLOGIES USED

### 4.1 Plate Region Extraction:

There are various techniques which are used to extract the number plate: color detection algorithm, edge detection algorithm, region detection algorithm. If these techniques are used combined then it is more beneficial. In this stage, take RGB image as input from that image extract the number plate of car using edge detection and color detection algorithm. Extracted image is output of this stage and it will be passing to the preprocessing stage as input.

### 4.2 Preprocessing:

In this stage, extracted image is received from the plate extraction stage. In preprocessing there are two stages:

a) Convert the number plate image into the gray scale image.
b) Gray scale to binary image.

For gray scale conversion we have standard formula: $R\times0.21+G\times0.71+B\times1.07$[5].For binary conversion of image there are various algorithms are available like Otsu algorithm and maximum entropy algorithm. We will use the maximum entropy technique or algorithm.

### 4.3 Morphological Operation:

This stage take input as binary image and do dilation and erosion. Many morphological operations are represented as combinations of erosion and dilation. Erosion removes small-scale details from a binary image but simultaneously reduces the size of regions of interest. Dilation has the opposite effect to erosion. It adds a layer of pixels to both the inner and outer boundaries of regions. It gives output as clear image and transfer image to OCR.

### 4.5 OCR:

In this stage, we extract character from image and those characters are send to the database to compare with it.OCR algorithm used to recognize the number from license plate of vehicle. The text from the number plate is separated by using the line separation algorithm and this separated text is the input for the OCR. Line separation adds each pixel value in a row. If the resultant sum of row is zero it means no text is present in row and if resultant sum of rows is greater than zero it means text is present in row. The first resultant sum greater than zero represent start of the line and after this the first resultant sum equal to zero represents end of line. The start and end of the line used to extract the first line in the text. Same process continues to separate the further line in the text.

### 4.6 Retrieval of data:

In this stage, takes the data from database which is information about car and it's owner details.

## V.PROPOSED SYSTEM

The proposed system takes input as JPEG and PNG image with edge and color detection algorithm extract the number plate, then extracted number plate region is converted to gray scale image with the help of maximum entropy image is binaries. On binary image for accuracy with morphological operation it process the delusion and erosion this image then transfer to OCR, it extract the individual character from plate and all those character string is compared with database. If given string is matched then it retrieve the information of car and details of owner.

## VI.CONCLUSION

Automatic License Plate Recognition (ALPR) System will process on images of number plate of cars and find out the details of car and owner. It will help police traffics to understand the detail of owner and car details and solve the problem of carry document This system consists of modules i.e. plate extraction, processing, morphological operations and OCR for character recognition. We have used edge and color detection algorithm for extraction, maximum entropy for binaries, morphological operation for noise removal and OCR for character recognition.

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