# AUTOMATIC LICENCE PLATE DETECTION AND RECOGNITION

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**Abstract -** *In our challenge, we use a digicam that clicks the image of the car which have a valid vehicle plate. Our mission reads the textual content from the input photo and extracts the range of automobile. The wide variety of vehicle is, then, appeared up through the directory of all of the cars which can be registered and are allowed to enter into the university premises, just like the vehicles owned by way of the college, and so on. If we discover in shape, the intimation is given to nearest authority .Right now proposed a framework to limitation of number plates for the most part for the vehicles which have various textual styles and have distinctive size moreover. This paper introduces a methodology dependent on straightforward and effective SOBEL edge identification algorithm. By utilizing the Gaussian algorithm. We diminish noise from the information picture.*

*The project is famous projects for Signals and Systems, and therefore, Math Works has some significant tools and support material. (When we search the project on Google then it is one of the very first links). However, we honestly want to learn the method of extracting text from the images. We want to learn about image processing with the help of MATLAB. There are a lot of things to learn about in this project. We look forward that the idea is liked by you. Moreover, we want to say that there will be very less plagiarism in the project.*

***Key Words***: image enhancement, segmentation, object reorganization, OCR (optical character recognition)

## 1. INTRODUCTION

Our project involves the extraction of text from the wide variety plate of a vehicle with the help of MATLAB. As we supplied within the summary, we are looking to build an automated system that reads the number from the picture of the number plate (captured with the aid of camera this is located at some location for this purpose) and then looks for the same in the organization's database of the registered automobiles. If any fit is found, then it shows the details of the proprietor of the auto. Otherwise it show that no detail is found for the given number of vehicle The project is based on the generalized idea of extraction of text from an image using the various image analysis tools provided with MATLAB. It involves learning the basics of image and text analysis wherein a significant focus has been given on Optical Character Recognition (OCR).

We have made certain assumptions regarding the image:

1. The image is captured with the help of a camera with a resolution of 12 Megapixels, so that the image is more clear.

2. The whole picture has a variety plate and its surroundings, not the entire automobile.

### 1.1 Theory Involved

There are broadly 3 types of images:

1. Document Images

2. Caption Text Images

3. Scene Text Images

There are numerous methods to extract text relying on the form of picture we are handling. In our project, we shall be concerned about 3rd kind, i.e., the scene text images. In these images, we seize a scene using a few recording tool like digicam, and extract the text that is the part of the scene. This text is commonly tough to detect and extract.

### 1.2 Related work

Many algorithms for the detection of the number plate and the algorithm for segmentation have been introduced to implement number plate detection system. Algorithms, to detect the number plate, classified into major three classes that are: -
(A) Color base, (B) Edge base, (C) Texture based.
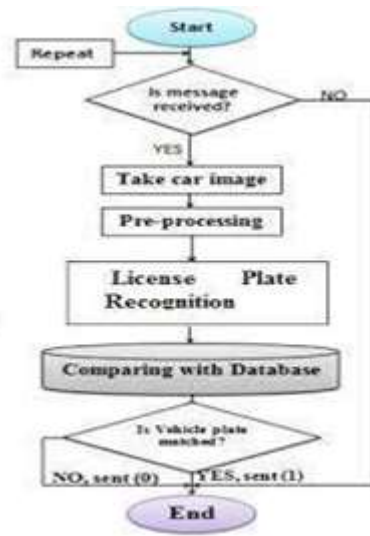
## 2. PROCEDURE



**Fig -1**: Methodology　　　　　　**Fig 1.1**: Flowchart of algorithm

### 2.1 Capturing the Image:

**Pre-processing**: Here, we convert the image into gray scale. This is required as we cannot identify important edges in colured image. Moreover, converting an image into gray scale reduces the complexity of the image.

**Noise Elimination**: There are various types of noises present in an image – salt and pepper, Gaussian, blurring of image, etc. We need to ensure that these noises are eliminated from our image in order to retrieve the text optimally. So, following noise reduction techniques are employed:

Median operator (to reduce salt and pepper noise)

Weiner Filter (to reduce Gaussian noise and blurring of image)

Morphological Filter (to enhance the character recognition)

### 2.2 Image Segmentation:

**Plate Extraction**: The number plate is cropped from the rest of the image. Then we apply some edge enhancement techniques like SOBEL operator, etc.

**Character Separation:** We, then, separate the characters out of the image. This is done on the basis of the height of the characters assuming all the characters in a number plate have the same height.

**Character Recognition**:

MATLAB provides various tools to recognize the characters. E.g. it has OCR () method that recognize the characters and saves them in an array.

### 3. PROPOSED METHOD

Number plate of any vehicle may be a model with terribly huge dissimilarity of distinction. If quantity number plate of vehicle is extremely like tough to spot the situation. When small changes occur to that then distinction as well as brightness is also changes. During this research paper the operations of morphological processing of image square measure want to obtain the distinct feature at intervals the number plate of any vehicle. This work is split in many parts:-

A. Capturing the input Image.

B. Binary conversion of captured image.

C. Reduction of noise.

D. By using histogram equalizer enhances contrast.

E. Plate localize operation

**3.1 Capture image**

Take the input image which is taken from the high quality device.



**Figure 2.0**: - Captured image

**3.3 Gray scale conversion**

From input RGB image it has to be converted to a gray scale, and thus the 8-bit gray value is also determined. After that we have using the proper MATLAB function (functionnumberPlateExtraction) to convert it to the binary image



**Fig: - Grey Scale Conversion**

FunctionnumberPlateExtraction

find = imread('Something.png'); //read image

 find = imresize(find,[400NaN]); //check size

GreyImage= rgb2gray(f); //image converted into grey

**3.4 Noise reduction**

Noise Reduction of the image is done by the Gaussian algorithm which is as follow:



Fig: - After Median Filtering

Algorithm:

For remove noise: for p = 2: length-1

for q = 1 : final

     totall= X(m - 1 : m + 1, p - 1 : p + 1, q);

     Aa =(Summ(Gx.* to)); x-axis = Summ(Aa);

     Bb= (Summ(Gy.* to)); y-axis = Summ(Bb);

     TotalpixelValue =sqrt(x-axis.^2+ y-axis.^2);

     %TotalpixelValue =(x-axis-y-axis);

     FinalOutput(m,p,q) = TotalpixelValue; end end

### 3.5 Contrast enhancement using histogram equalization

We use the technique of histogram equalization to enhance the contrast of each image. The enhancement function we use is J=histoog(p); histoog function is used for the contrast enhancement of the images.

When image pixel intensity of 8-neibourgh connectivity, we supply a desired histogram, histoog chooses the grayscale (image) transformation T to minimize $\left| c_1 (T(p))-c_0(p) \right|$

Below is the histogram update from the image (Figure 2.2) and after using histogram equalization (Figure 2.3), the contrast improvement was applied.



Figure: 2.2 - Before contrast enhancement      Figure: 2.3 - After contrast enhancement

### 3.6 Plate localization

The basic step in recognition of Car variety plate is to observe the plate size. Normally variety plates square ensure rectangular in shape. And therefore the concept of an oblong plate should be studied. Mathematical morphology are accustomed observe that region. Exploitation SOBEL edge detector we have a tendency to accustomed high light weight regions with a high edge magnitude and high edge variance square measure known. Relying upon the brink price edge is detected from the input image. The input image before executing the SOBEL Edge detection theorem is shown in Figure 2.4.



Figure: 2.4 – Image before applying SOBEL Algorithm for finding edge:

**Figure: 2.5** – Image after applying SOBEL Algorithm for filling holes:

Fill=imfill (out1,'holes'); Sel=bwmorph (Fill,'thin', 1); Sel=imerode (Sel, strel ('line', 2, 92));



**Figure: 2.6** – Image after filling the holes

## 4. EXPERIMENTAL RESULTS

Under MATLAB R2013a or above set, we have run our proposed method on a system / computer that has Corei5 dual processor 2.26 MHz with 4 GB RAM. Many pictures of Cars are clicked using or above the at least 12 mega pixel sensor. Throughout the experiments, we test our proposed method for identifying the number of the plate on the various forms Car image.
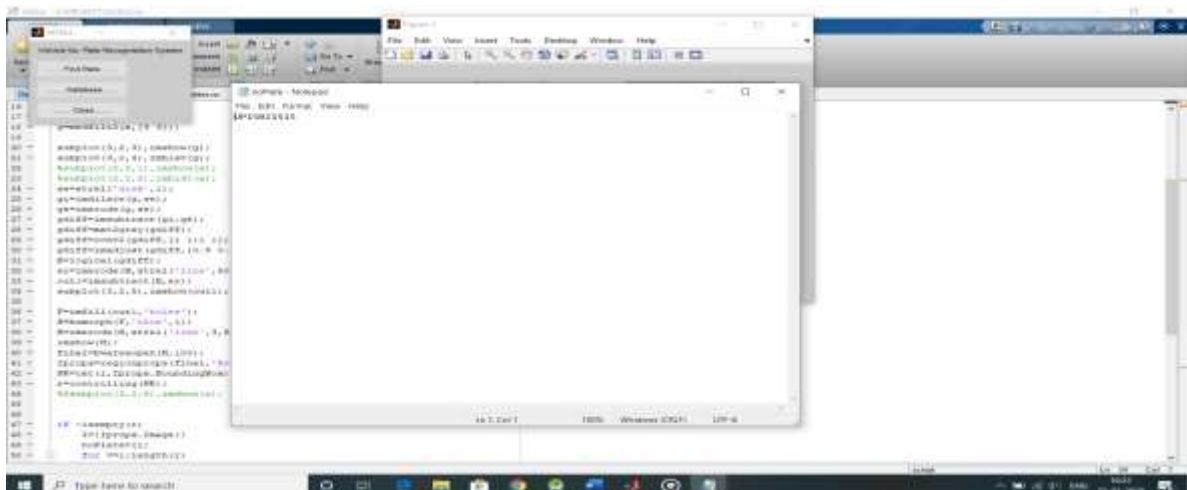


**Figure: 2.6** – Final result of the system

## 3. CONCLUSION

Within this research paper, an effective method of identification of vehicle number plate is proposed which is less time consuming and applied to various types of pictures. Edges could be recognized here through the use of the SOBEL edge detection method, and also the holes are filled but with far less than 8 pixels. To retrieve the vehicle's number plate we delete attached parts / pieces and under 1000 pixels. Our proposed set of computer instructions is mainly based on Indian car number plate scheme, the accuracy of extracting the number plate for low quiet mood can be increased, as well as we can detect the number plate that has different font size and also different font type.

## FUTURE SCOPS

The future scope is that the automatic vehicle recognition system plays a major role in detecting threats to defense Also it can improve the security related to the women's as they can easily detect the number plate before using cab or other serives. The system robustness can be increase if bright and sharp camera is used. Government should take some interest in developing this system as this system is money-saving and eco- friendly, if applied effectively in various areas...

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