# “ NEW LICENCE PLATE RECOGNITION METHOD USING MATLAB SOFTWARE ”

## 1. ABSTRACT

The emphasis of the project is mainly on proposing a new method of License Recognition that can be implemented in real life. License Recognition has great scope in daily life as it can be used in tollbooth for automated recognition of license plate using a simple photograph of that vehicle. This automated recognition can be implemented in car parking also. The technique being proposed makes use of various Image Processing techniques such as Erosion, Dilation, Histogram equalization and then uses Feature extraction concepts of Image Processing for the recognition part. The existing processing algorithms give a image that will be full of noise, the type of character recognition can be done by a human eye only but not with a normal computer processing system. In real time, the vehicles will be moving and the images will be blurry and then the existing type of processing will make the output worse. The proposed technique helps us in reducing noise and also helps us in processing images in real time. The results also show that the proposed technique performed better than the existing techniques in processing time, noise reduction, accuracy and real time analysis.

**KEYWORDS – Feature extraction, Opening, Histogram equalization, Noise reduction, Thresholding**

## 2. INTRODUCTION

We intend to create an automated system by using MATLAB which is going to detect and recognize the license plate of the car. Moreover, we want to contribute in the Smart City initiative. Basically we are taking an image from the outside environment and processing it based on a certain algorithm in MATLAB. We are showing the output as a string or a group of characters. There are many applications such as traffic monitoring, tracking stolen cars, managing parking toll, red-light violation enforcement, border customs checkpoints. It uses optical character recognition on images to read the license plate of that vehicle. The existing methods lack in areas such as noise reduction, accuracy control and real time processing. The proposed technique overcomes these loopholes and is successfully implemented to reduce noise, improve the accuracy, and implement in the real time environment.

## 3. LITERATURE SURVEY

EXISTING TRAFFIC CONTROL SYSTEM

– Present system is completely a static case

– Vehicles must wait at the intersection for a predefined time until microcontroller switches green light for that lane.

– Exists no process of preemption.

– No green light service for priority based vehicles.

From the past decades, management of traffic has been one of the biggest issues of modernization. Researchers have followed a long way to overcome the traffic crisis. Right from the very beginning, “Manual Traffic Control” in which man power was required to control the traffic is implemented. Depending on countries and states the traffic polices are allotted to different areas to control traffic. These men carry sign board, sign light and whistle to control the traffic. They are instructed to wear specific uniforms in order to be easily identified by the drivers. After this, came the traditional “Vehicle Actuated Control System” in which, lights are loaded with constant numerical value in the form of timers. The lights are automatically getting ON and OFF depending on timer value changes. The main disadvantage is that the algorithm for this control system does not change the green signal even if the traffic has already passed until the counter is complete, while not taking into account the number of vehicles waiting at red. Hence the density of the traffic does not matter. Next in generation is the “Automatic Traffic Light”, which is the modified version of vehicle actuated control system with addition to timers and electrical sensors. In this technique, electronic and electrical sensors are added to detect vehicles and produce signals that the time is being wasted by a green light on an empty road. The established traffic control management systems are inadequate for handling huge amount of traffic load as they are incapable of meeting the growing number of vehicles on road. Drawbacks to these particular controlling methods: -

- Only skilled operators can make suitable judgment and decisions because sometimes the situation is very complicated and many factors are needed to be considered.

- The operator is under very high work load as he has to continuously take decisions and review the traffic conditions at small intervals of time.

## 4. METHODOLOGY

Firstly, we need an image of a vehicle in order to perform the following tasks: Edge enhancement followed by morphological operators and finally extracting the plate region. Finally with the help of optical character recognition we can get the numbers or string in a text file.

**Module 1 – Input Number Plate Image**

```
[FileName,PathName] =
uigetfile('*.jpg;*.png;*.gif;*.tif','Select an image');
i=imread(strcat(PathName,FileName));
```

**Module 2 – Grayscale Conversion**

```
i1=rgb2gray(i)
figure(1)
imshow(i1)
```

**Module 3 - Thresholding**

```
t=graythresh(i1)
i2=im2bw(i1,t)
figure(2)
imshow(i2)
```

**Module 4 – Median Filtering**

```
i3=medfilt2(i2)
figure(3)
imshow(i3)
```

**Module 5 – Image Dilation**

```
SE=strel('rectangle',[3,3])
i4=imdilate(i3,SE)
figure(4)
imshow(i4)
```

**Module 6 – Image Erosion**

```
i5=imerode(i3,SE)
figure(5)
imshow(i5)
```

**Module 6 - Subtraction**

```
i6=imsubtract(i4,i5)
figure(6)
imshow(i6)
```

**Module 7 – Border Extraction**

```
i7=imclearborder(i6)
figure(7)
imshow(i7)
```

**Module 8 – Gap filling**

```
i8=imfill(i7,'holes')
figure(8)
imshow(i8)
```

**Module 9 – Image Opening**

```
i9=bwareaopen(i8,50,8)
```

```
figure(9)
imshow(i9)
```

**Module 10 – Image Thinning**

```
i10=bwmorph(i9,'thin')
figure(10)
imshow(i10)
```

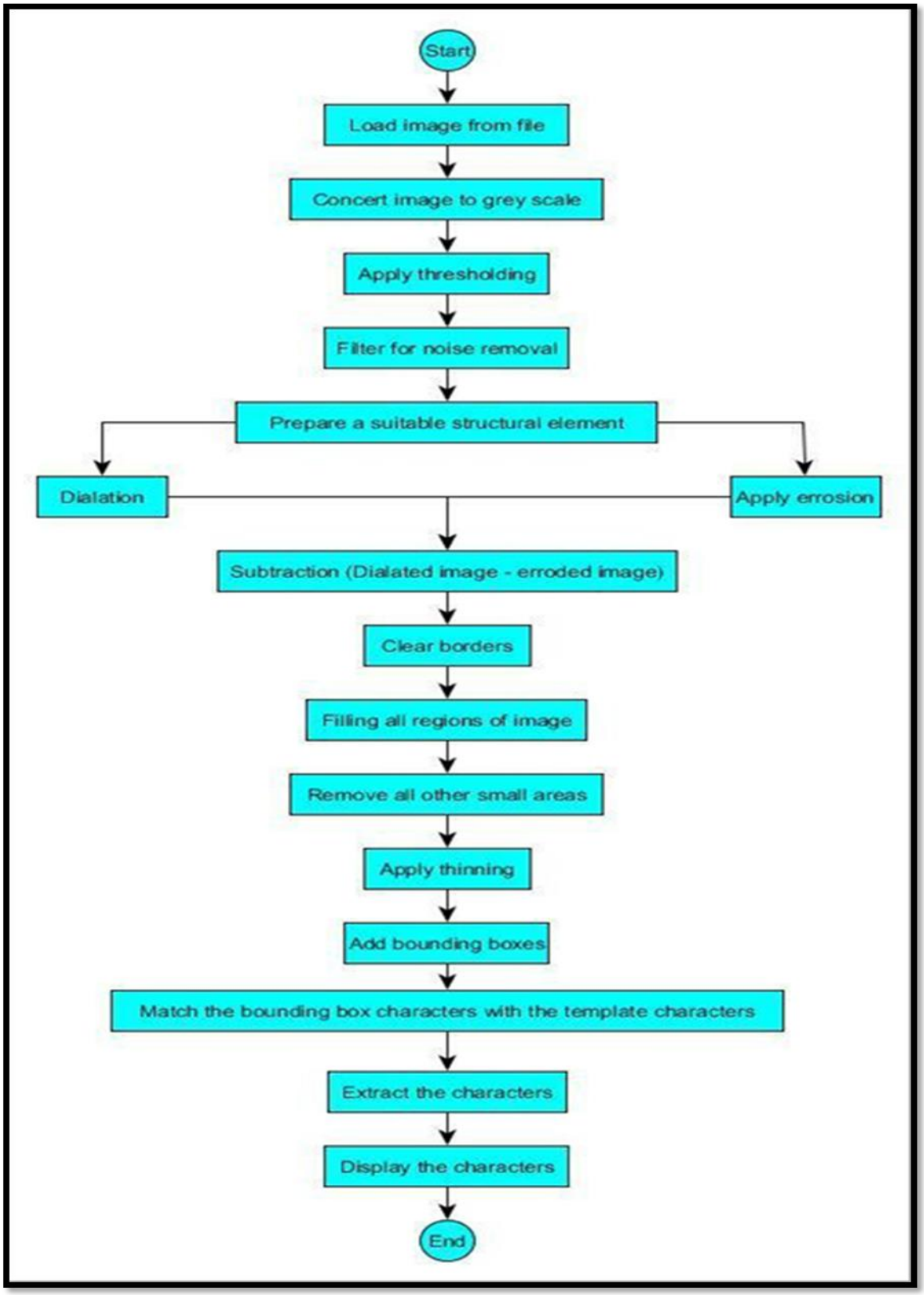
**Module 11 – Bounding Box**

```
st =
regionprops(i10,'Bound
ingBox') figure(11)
imshow(i10)
```

**Module 12 - Recognition**

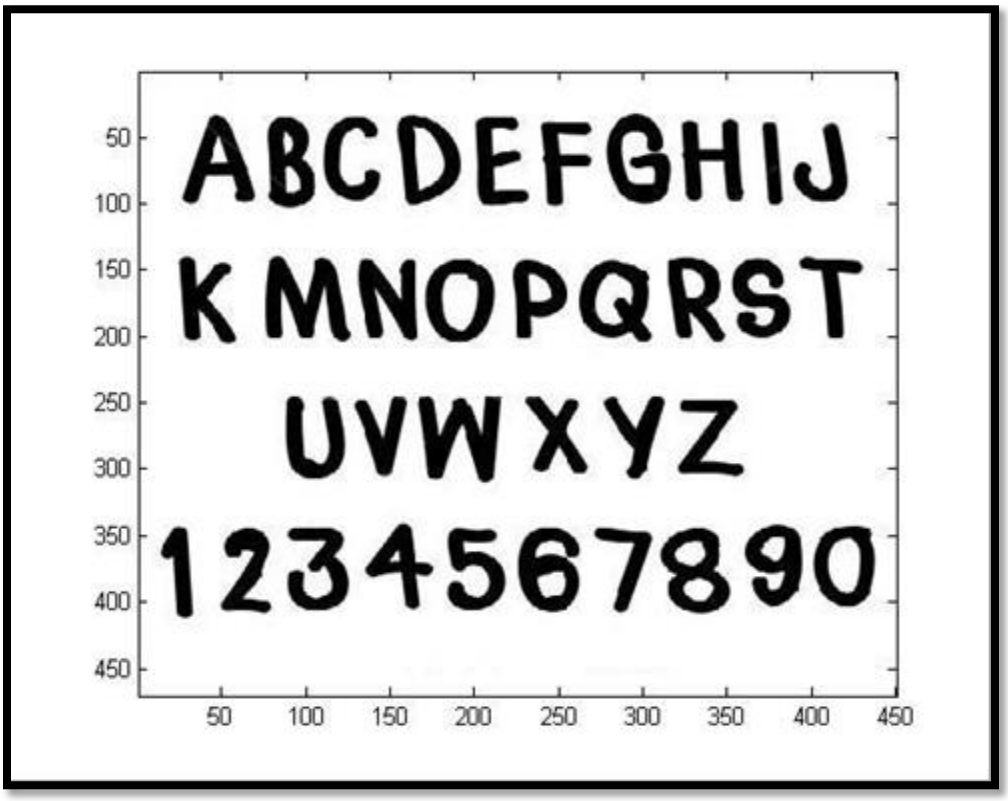
```
for k = 1 : length(st)
  BB = st(k).BoundingBox
  rectangle('Position', [BB(1),BB(2),BB(3),BB(4)],.'EdgeColor','g','LineWidth',2 )
End
```

## ALGORITHM AND FLOWCHART



## 5. EXPERIMENTAL RESULTS AND DISCUSSION

**Sample Template**




**Input Image**

**Output Images :**


**Figure 1**


**Figure 2**


**Figure 3**

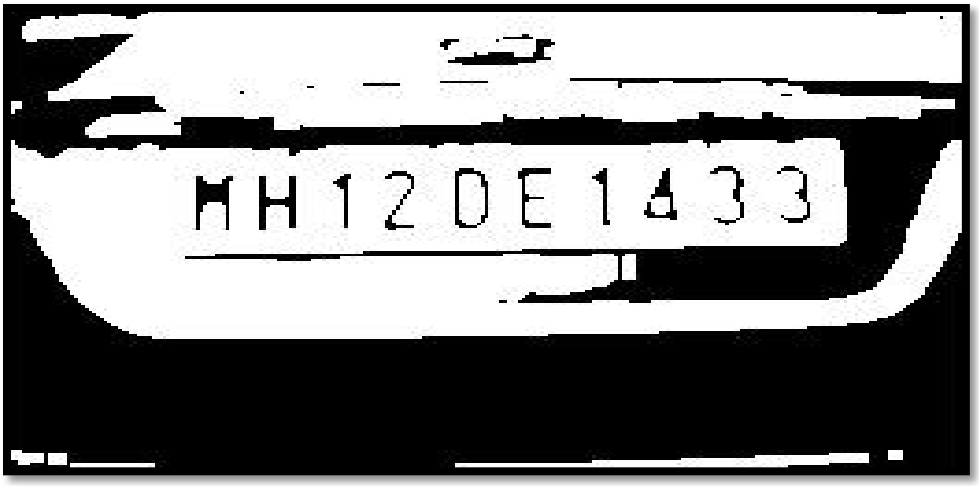



**Figure 4**


**Figure 5**


**Figure 7**


**Figure 8**


**Figure 9**


**Figure 10**

**Figure 11**

**FINAL OUTPUT :**

## 6. PERFORMANCE EVALUATION/COMPARISON WITH EXISTING ALGORITHMS

We take here a method by Xiaofeng Zhang, Fengchang Xu and Yan Su* as proposed in their paper "Research on Licence Plate Recognition based on MATLAB".

The methodology they used was to first convert the coloured image into grey scale image using histogram equalization, remove the noises through self-adaptive median filter and then to stretch that image to enhance the overall contrast. Then they sharpened using Log-Prewitt operator the image and edges were enhanced using Prewitt edge detection method.

The above procedure is quick but doesn't give quality results. It might work for some static images but for for real time implementation it is a very bad idea.

SAMPLE IMAGE


GRAYSCALE CONVERSION


ADAPTIVE MEDIAN FILTERING


GRAY STRETCHING

GRADIENT SHARPENING

**COMPARISON :**

As can be seen from the results, the existing technique has a lot of noise in it. But the proposed technique is noise free.

In terms of speed also, the proposed technique in the paper gave faster results as compared to the existing techniques. The proposed technique took 2.42 seconds while the earlier technique took 3.3 seconds.

Also, for the earlier technique the image file had to be static while in the newly proposed technique we can impose it in real life world also.

## 7. CONCLUSION

As we can observe in above sample that this processing algorithm will give an image that will be noise free, this type of recognition can be done with the help of a normal computer processing system.

In real time, the vehicles will be moving and the images will be blurry and then other types of a processing can make the output even more worse. Hence the method proposed in this paper is a very reliable method, is quick and give results with high accuracy.

## 8. REFERENCES

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