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# AUTOMATIC VEHICLE NUMBER PLATE SEGMENTATION AND RECOGNITION

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**Abstract**: Automatic Number Plate Recognition (ANPR) plays an important role in Intelligent Transport System. Number plate extraction is the major key step before the plate recognition. This paper presents a method for extraction and recognition of the vehicle number plate from the image automatically. The camera is used to capture the image automatically. The segmentation is used to segment the characters of number plate. The segmented characters are then recognized by using template matching. The template matching matches all the characters stored in database. This presented algorithm works on real time images.

**Keywords**: Camera, Vehicle Number Plate, Character Segmentation, Character Recognition, Automatic Vehicle Number Recognition (ANPR)

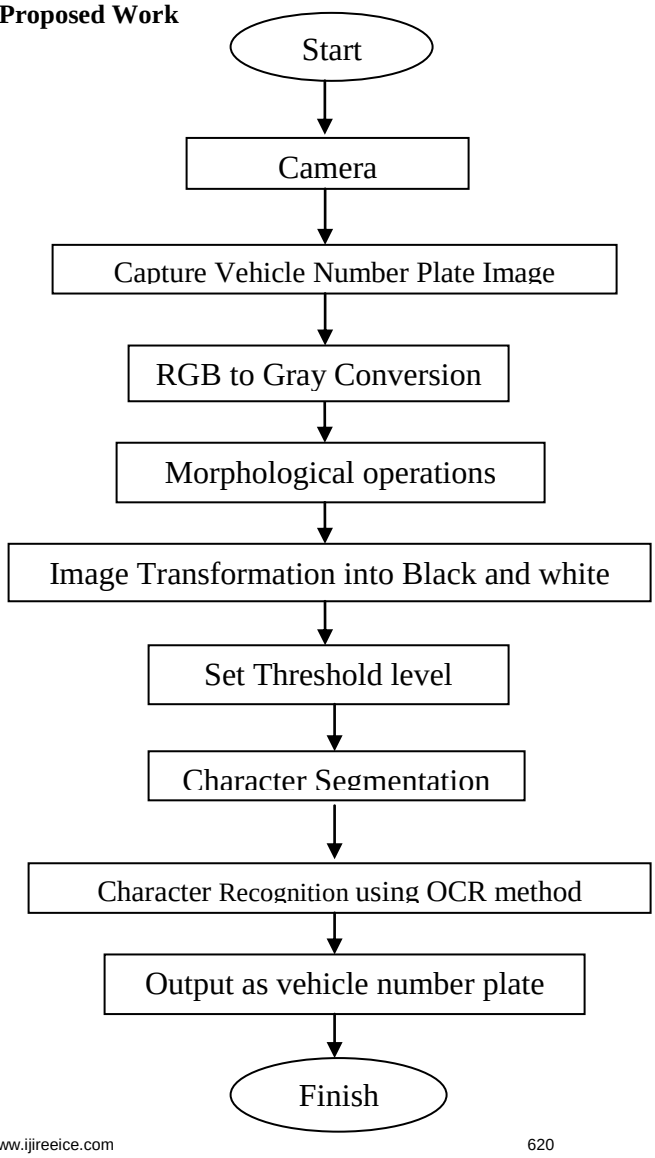
## I. INTRODUCTION

Number Plate recognition plays an important role in various applications such as traffic monitoring on road, automatic toll payment, parking lots access control, detection of stolen vehicles. To identify a car number plate is effective because of its uniqueness of the car. Real time number plate recognition plays an important role in automatic monitoring of traffic rules. The recognition of car number plate can be used for automatic car parking because each car has its own identification number.

The camera is used to capture the image automatically and can beused for many application such as automatic toll plaza and car parking [1, 2]. If the vehicle number plate is degraded by dirt or illumination effects ANPR could not recognize the plate properly. So preprocessing is used before recognition [3, 4]. Orientation Measurement method is used to calculate the car 3D distance and 4 corner points direction of its number plate. By this the number plate can be detect and track [5].

**Motivation**: For the standard number plates the automatic number plate recognition becomes very easy to read and recognizes the character. In India the vehicle number plates has no standard size and font so it become very difficult to read and recognize the characters of the number plate. So flexible algorithm required solve this problem.

**Proposed Work**



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**Algorithm:**

**First Step:** Start the camera to take images

**Second Step:** Capture the vehicle number plate image as an input.

**Third Step:** Convert RGB Image into Gray.

**Fourth Step:** Morphological Operation Dialation is used. Dilation allows objects to expand

**Fifth Step:** Set the threshold level before segmentation. In this algorithm the maximum threshold level is 500.

**Sixth Step:** Segmentation method is used to make segments of cropped Image. The Segmentation part split the all characters of vehicle number plate and further these segmented characters are used for the Recognition.

**Seventh Step:** At last the OCR technique is used for recognition. The OCR method matches all the characters with stored database and gives best matched character as output.

## RESULTS

In our experiment we are using camera which captured the vehicle number plate and that further used for character recognition. The segmentation is used to separate the characters and numbers in segments. The recognition use OCR technology to recognized the characters and produces the characters as vehicle number plate.


Figure Image captured by camera

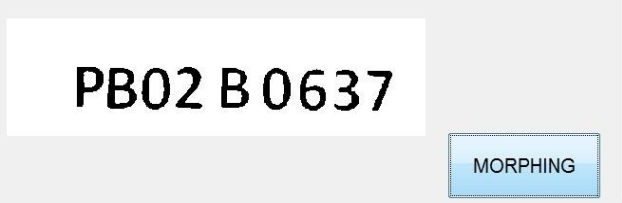
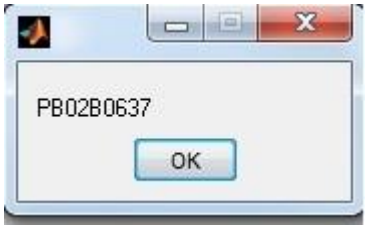



Figure Result after Morphological operation


Figure Segmentation


Figure Recognized Characters




## CONCLUSION

In this paper we proposed a method to recognize the vehicle number plate automatically. The dialation is used to expand the foreground. The segmentation part makes segments of characters of captured vehicle image plate. The OCR method is used to recognize the vehicle number plate characters. This experiment is tested for Indian vehicle number plates using MATLAB.

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