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# Automatic License Plate Recognition: (ALPR)

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**Abstract:** *Automatic license plate recognition (ALPR) is the extraction of vehicle license plate information from an image or a sequence of images. The extracted information can be used with or without a database in many applications, such as electronic payment systems (toll payment, parking fee payment), and freeway and arterial monitoring systems for traffic surveillance. . The quality of the acquired images is a major factor in the success of the ALPR. ALPR as a real-life application has to quickly and successfully process license plates under different environmental conditions, such as indoors, outdoors, day or night time. . ALPR technology tends to be region-specific, owing to plate variation from place to place. Concerns about these systems have centered on privacy fears of government tracking citizens' movements, misidentification, high error rates, and increased government spending.*

**Keywords:** *Android Phone, License Plate, Image Acquisition, Plate Extraction, Plate Segmentation, Character Recognition*

## 1. INTRODUCTION

This Our project is based on Automatic License Plate Recognition, is used for checking whether the vehicle,s which are using the License plate(number plate )are valid or not. Automatic license plate recognition (ALPR) plays an important role in numerous real-life applications, such as automatic toll collection, traffic law enforcement, park-ing lot access control, and road traffic monitoring [1]-[2]. ALPR recognizes a vehicle's license plate number from an image or images taken by either a color, black and white, or infrared camera. But in our project we are just using the Android camera which is more useful and simpler to handle. We are using the ALPR technique this technique is also known as Automatic Number Plate Recognition (ANPR).To implement this most important technique that we are using is Optimal Character Recognition (OCR).

### 1.1. Motivation and Aim

In this project we aim to make an application which will help for police and mostly for traffic police in each state for doing thier work very efficiently and in very small time. Also we implement this project with help of android phone which easily available with all traffic police. And which make this application very easy to handle. And for this we provide centralised website of RTO as well as dummy website.

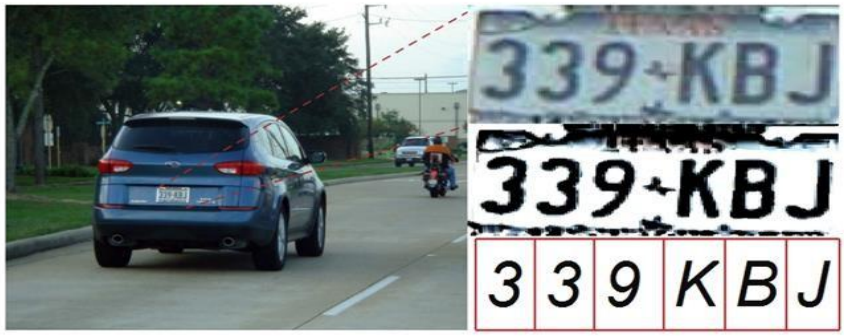
## 2. METHODS

It is an application where you can get all the facilities on one click. This application is user friendly as well as Responsive, which mean a user is cable of using an Android mobile .But to work this application properly we need one centralised website of RTO, which will help to give the information about the particular vehicle. We also give the dummy website for this application if the centralised website is not available. First we clicking an image of vehicle and then this image is give to our application after this some operations are performed on that image like image acquisition, license plate extraction, license plate segmentation, character recognition etc. Then we get actual number of our vehicle, from that number we get detail information of that vehicle

## 3. ALGORITHMS

**Algorithm1.**

*Region of Interest Extraction:* The license plate is extracted based on some features such as the color, the boundary, or the existence of the characters

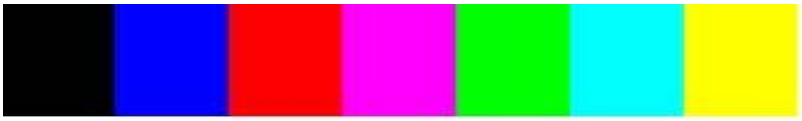



**Algorithm2.**

*Gray Scale conversion:* After getting Extracted plate this algorithm is calculating Gray value of each pixel and finally we get the Gray scale image

*Steps in Gray Scale Algorithm*

- The lightness method averages the most prominent and least prominent colors: (max(R, G, B) + min(R, G, B)) / 2.
- The average method simply averages the values: (R + G + B) / 3
- The formula for calculating the Gray value is 0.21 R + 0.72 G + 0.07 B.



**Algorithm3.**

Binary Image(Otsu algorithm):-This algorithm is used to convert the gray image into binary image for this we have to calculate the Threshold value and Otsu algorithm is used to calculate the threshold value.

A Faster Approach:-By a bit of manipulation, you can calculate what is called the between class variance, which is far quicker to calculate. Luckily, the threshold with the maximum between class variance also has the minimum within class variance. So it can also be used for finding the best threshold and therefore due to being simpler is a much better approach to use.

**Algorithm4.**

Morphological Operations (Dilution And Erosion) :-Sometime there may be unwanted texture in image so to get proper image we are performing the morphological operation on image like dilution and Erosion.

## 4. CONCLUSION

No need to carry hard documents of vehicles everytime . Details of vehicles by using its number plate image can be viewed on the App. Target users of the App are Police and Traffic Police. So the App cannot be misused. ALPR system consists of four processing stages.In the image acquisition stage, some points have to be considered when choosing the ALPR system camera, such as the camera resolution and the shutter speed. The future research of ALPR should concentrate on multistyle plate recognition, video-based ALPR using tempo- ral information, multiplates processing, high definition plate image processing, ambiguous-character recognition, and so on.

***System Features***

- Parking lot management
- Automatic Toll Booth on highway
- Border Crossing
- Mass material management system

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