

# Automatic Fetching of Vehicle details using ANPR Camera

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**Abstract** – The number cars worldwide are set to double by 2040. With the rise in number of car owners each year, the traffic control and identification of vehicle owner is getting tedious. On occasions where there are multiple people breaking the traffic rules like speeding or not having a license, the traffic personal will have a hard time catching all of them. Automatic Number Plate Recognition (ANPR) system, a camera-based number recognition system which reads the number plate of multiple vehicles at a time, comes handy in such situations. With the help of ANPR cameras and a database with the stored information about the vehicle owner will automatically filter such individuals out. Technologies such as text to speech will give impromptu notice to the traffic personal about the car breaking the traffic rule. Doing so will reduce the margin of error as well as give the person in charge the Real-Time Traffic Information and enough time to react and catch the culprit.

**Key Words:** ANPR System, Number recognition system, Database, Text to speech, Real-Time Traffic Information

## 1. INTRODUCTION

ANPR system is an image-processing innovation which is used to recognise vehicles by their license plates. This Recognition System also takes out the abnormal state information from the digital image captured. The useless homogeneity includes the dimension and the outline of the License Plate.

The ANPR system consists of following steps: -

- i. Vehicle image capture.
- ii. Pre-processing.
- iii. Number plate extraction.
- iv. Character segmentation.
- v. Character recognition.

The initial step of ANPR system is location of the vehicle and capturing the image of vehicle, the second step is the localization of Number Plate and then the extraction of vehicle Number Plate is done. The final step uses image

segmentation strategy. Segmentation is done for individual character recognition. This sums up the purpose of the ANPR camera in this system. Next, the number is searched through the database available at the traffic control room. This database includes all the information regarding the owner. This process is followed for multiple vehicles in the traffic at a given time simultaneously. Finally, the vehicles disobeying the traffics rules are marked and the numbers are sent to the official on-duty to check. This part is done by the use to text to speech converters used in the system.

## 1.1 Methodology

- The process of ANPR starts with identifying a registration plate of the vehicle.
- It involves the algorithms used which are able to identify the rectangular area of the registration plate from an original picture.
- This is achieved through video cameras capturing images that are analyzed using Optical Character Recognition (OCR), which scans each group of pixels within the images and estimates whether or not it could be a letter and replaces the pixels with the ASCII\* code for the letter. (\*)
- ANPR cameras need to be of a special type and set up within certain designated parameters.
- The identification and recognition process takes place in four phases mainly.
  - (1) Preprocessing of Image
  - (2) Localizing Registration Plate
  - (3) Segmentation of Characters
  - (4) Recognition of Actual number plate.
- The implementation is started by capturing the number plate of the vehicle.
- When the number plate is of sufficient size for the OCR software the frame is scanned and the registration number is converted to ASCII code and held in a list.

- This continues for a series of images according to the speed and position of the vehicle ensuring that the optimum view of the license plate is achieved.
- The contrast extension and median filtering techniques enhance the gray level of registration plate image.
- Next is the character segmentation part which further segments the character individually from the extracted number plate.
- For easy comparison of the input character with the character in the database the result is normalized into the character set as the size of the images in the database.
- Finally, it's time to apply Optical Character Recognition.
- The optical character recognition is a recognition method in which the input is an image and the output is a string of character.
- Template matching is one of the approaches of OCR.
- OCR automatically identifies and recognizes the characters without any indirect input.
- The characters on the number plate have uniform fonts then the OCR for number plate recognition is less complex as compared to other methods.
- The edge detection and gray scale filter is applied initially as a preprocessing for selected images to isolate the number plate region which is a smaller part from the extracted image.

## 1.2 Proposed Model

- In this project, we propose an automatic and mechanized license and number plate recognition system which can extract the license plate number of the vehicles passing through a given location using image processing algorithms.
- Using special cameras, the system takes pictures from each passing vehicle and forwards the image to the computer for being processed by the ANPR software.
- Plate recognition software uses different algorithms such as localization, orientation,

normalization, segmentation and finally optical character recognition (OCR).

- The resulting data is applied to compare with the records on a database.
- Experimental results reveal that the presented system successfully detects and recognizes the vehicle number plate on real images.
- This system can also be used for security and traffic control.
- This system can also be used to identify stolen vehicles on roads.
- The images taken by these cameras are subsequently processed in a computer.
- All vehicle traffic information is stored in the system database for a long time.
- Thus, detailed traffic information can be retrieved from different parking gates at different times.

## 2. Equipment and system used

Multi-lane vehicle number plate recognition system can be divided into a camera unit and enclosure unit. The camera unit is composed of a housing, a camera, a lens, an IR LED controller, and an IR LED board. The enclosure unit includes an enclosure, a controller and an SMPS. The camera is a device for acquiring images, and the IR LED controller and the IR LED board are devices for lighting at night or in the rain.

Camera specifications are as follows: The number of pixels of the image to be photographed is proportional to the square of the number of lanes. A camera of 2.8 megapixels was used for two-lane ANPR, and in order to obtain the same level of image quality, a camera and lens were used for three lanes and 11.2 megapixels for four lanes.

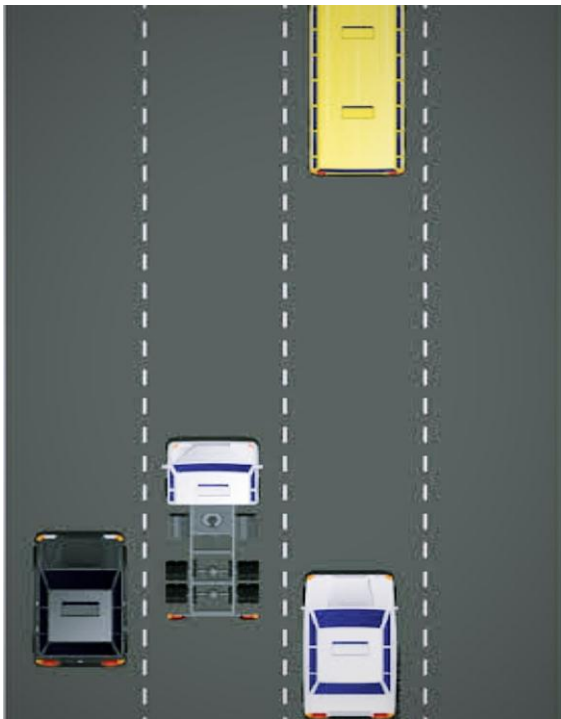
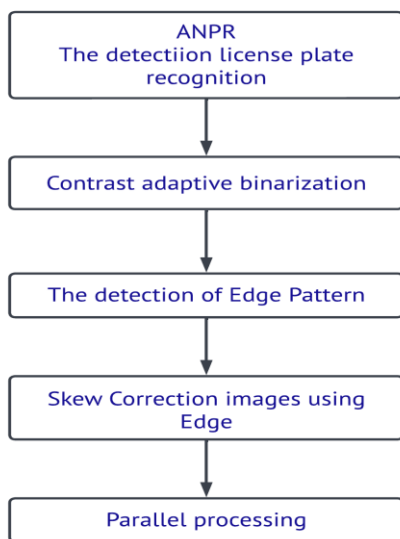


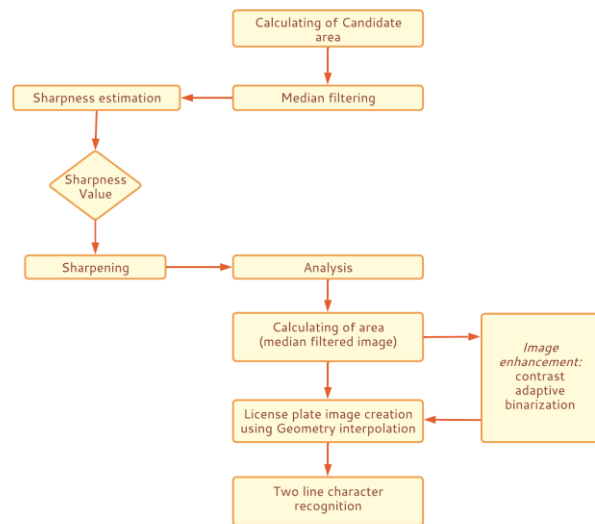
Fig - 01

2.1 Flow Chart and Steps



ANPR Recognition

Fig-02



The Process of Recognition of Number plate

Fig - 03

3. CONCLUSIONS

ANPR can provide various benefits like traffic safety enforcement, security- in case of suspicious activity by vehicle and immediate information availability. It can be further extended as multilingual ANPR to identify the language of characters automatically based on the training data. For low resolution images some improvement algorithms like super resolution should be focused. Most of the ANPR focus on processing one vehicle number plate but in real-time there can be multiple vehicle number plates being processed.

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**BIOGRAPHIES**

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