VEHICLE NUMBER PLATE DETECTION, IDENTIFICATION AND MONITORING OF VEHICLES FOR A CRIMINAL RECORD

Shubham Sangle[1], Samiksha Deshpande[2], Pranali Survashi[3], Pooja Kanwate[4], Apurv Tayade[5],

Prof. Aarti Gaikwad[6]

[1-6]Department of Information Technology Engineering, D. Y. Patil College of Engineering, Akurdi, Pune-44, Maharashtra, India

---***---

Abstract - *Automatic Number Plate Recognition (ANPR) is a technology that uses Optical Character Recognition (OCR) to read the registered vehicle number plate. image processing technology which uses a number (license) plate to identify the vehicle. In this paper, we have introduced by using Optical Character Recognition (OCR) how the respective authority can monitor vehicles for a criminal record. In this system Vehicle Number plate first get detected, Identified and monitored of vehicles for criminal records. So basically, the system includes 4 Modules i.e Detection, Identification, Monitoring and Web application (for Notifying police) Respectively. The aim is to provide an efficient automatic vehicle identification system by using the vehicle number plate. The system can be implemented on residential societies, tolls, business complexes and parking spaces in India where crimes happen because of a lack of an automation system for vehicle monitoring.*

Key Words: **Automatic Number Plate Recognition (ANPR), Optical Character Recognition (OCR), criminal record, Detection, Identification, Monitoring.**

1. INTRODUCTION

Number Plate Detection System is an advanced License technology computer vision-based system and has the power to mechanically determine the vehicle by capturing and recognizing the number plates of any vehicle with the assistance of a video, provided by CCTV cameras. In the previous couple of years, various Plate Detection has been one in all the helpful approaches for vehicle surveillance. It will be applied at a variety of public places to achieve some of the needs like traffic safety, social control, automatic toll text assortment, car park system and Automatic vehicle parking system.

ANPR algorithms are usually divided into four steps Vehicle image capture, Number plate detection, Character segmentation and Character recognition [1].

The first step is to capture the video and the 2nd step to capture the image of a vehicle appearance terribly straightforward however it's quite exigent task because it is very troublesome to capture a picture of a moving vehicle in real time in such a way that none of the elements of the vehicle particularly the vehicle number plate should be lost. The success of the fourth step depends on whether the second and third step are ready to find vehicle variety plates and separate each character.

Automatic number plate recognition helps to combat organized high-risk locations like connecting roads, town centers, airports and public buildings [2]. moveable and stationary ANPR cameras and analysis computer code gives continuous traffic surveillance work. Recorded ANPR knowledge is transmitted in real time then processed in a very secure knowledge centre [3]. The Web Application is then used to evaluate the information for comparison against watch lists, instantly alerting the police and security authorities once a suspect vehicle is known [4].

ANPR systems use CCTV cameras, this can be to not say that CCTV is analogous to ANPR. The CCTV system sometimes captures the videos and from that video this algorithm can discover the pictures of bikes, cars etc [5]. whereas its number plate and records the number plate knowledge within the sort of a text. There will be information which incorporates vehicles that are taken or those linked to crime [6]. This technique is going to be checking the vehicle number against the vehicle numbers that square measure enclosed within the information.

2. Litreture Review

We have ready this paper that represents the approach that is totally supported easy and economical operation and a few morphological operations and a few edge detection techniques. It presents an easy approach to capture all the alphabets and numerics employed in the

plate. once capturing the image from the video to investigate the distinction of the machine-coded image exploitation some rule named bar graph exploit.

we mainly concentrate on two steps, initial is to visualize the number and therefore the second is to observe all the numbers and letters to spot every number individually. this method is ready supported pictures and may be simply applied to toll systems for the employment of documenting access of passing services, security usage of roads, and additionally to stop automobile felony problems.

The projected rule is predicated on a mixture of morphological operation with space criteria tests for variety plate localization. The mentioned paper presents a automobile plate recognition system.it describes style algorism and therefore the way forward for implementation. this technique is prepared supported photos and should be merely applied to toll systems for the utilization of documenting access of passing services, security usage of roads, and collectively to forestall automobile larceny issues.

Those are plate localization, character segmentation, and character recognition. First, the amount of the plate is extracted from the first image, then the characters from it are isolated, and at last, every character is recognized.

The algorithms were developed employing a set of coaching pictures. The ultimate program is capable of extracting the required data in an exceedingly high share of the take a look at pictures. Associate degree economical and sturdy technique of locating license plates is given. the tactic makes use of the wealthy corner data within the plate space and therefore the edge data of license plates. It will contend with harder location issues, particularly with a registration code that's already living in an exceedingly difficult background.

3. System Development

3.1 Architecture

Fig 1 depicts the system architecture of the proposed system i.e., Vehicle number plate detection, Identification and monitoring of vehicles for a criminal record. Therefore, the architecture will give a brief idea about the current system:

The current application is Vehicle Number plate detection, Identification and monitoring of vehicles for criminal records. So basically, the system includes 4

Modules i.e Detection, Identification, Monitoring and Web application Respectively. Which are covered in the above architecture.
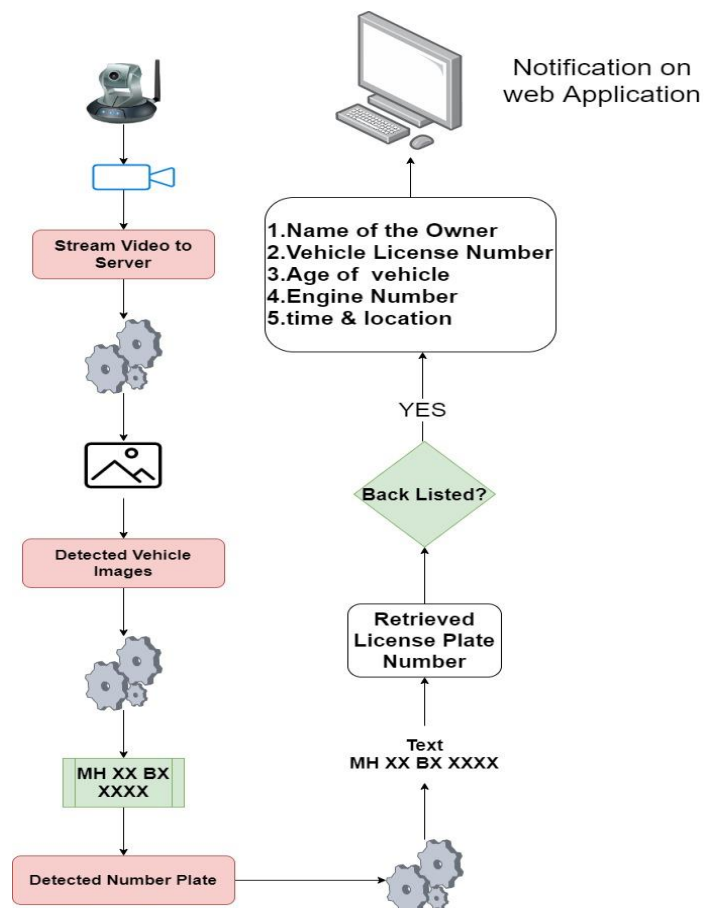
The process starts from capturing the video of the vehicle, the video is captured through CCTV cameras which are installed on tolls or any other public places. The video will be divided into frames. From that frame the vehicle image will be detected. So now the system will detect the number plate of that vehicle from that detected image. The numbers and characters which are present on that number plate will get detected and extracted and stored in the form of text.

So, in the next process system will identify the extracted text is present in blacklisted database or not. If yes, then the system will notify to the police the information of blacklisted vehicle those are the "Name of the Owner", "Vehicle license number", "City", "State", "Age of Vehicle", "Engine Number", "Location where the vehicle detected", "Fuel Type".

This information will be provided to the web application. After getting the notification to police, the current system will help them to catch the criminals.
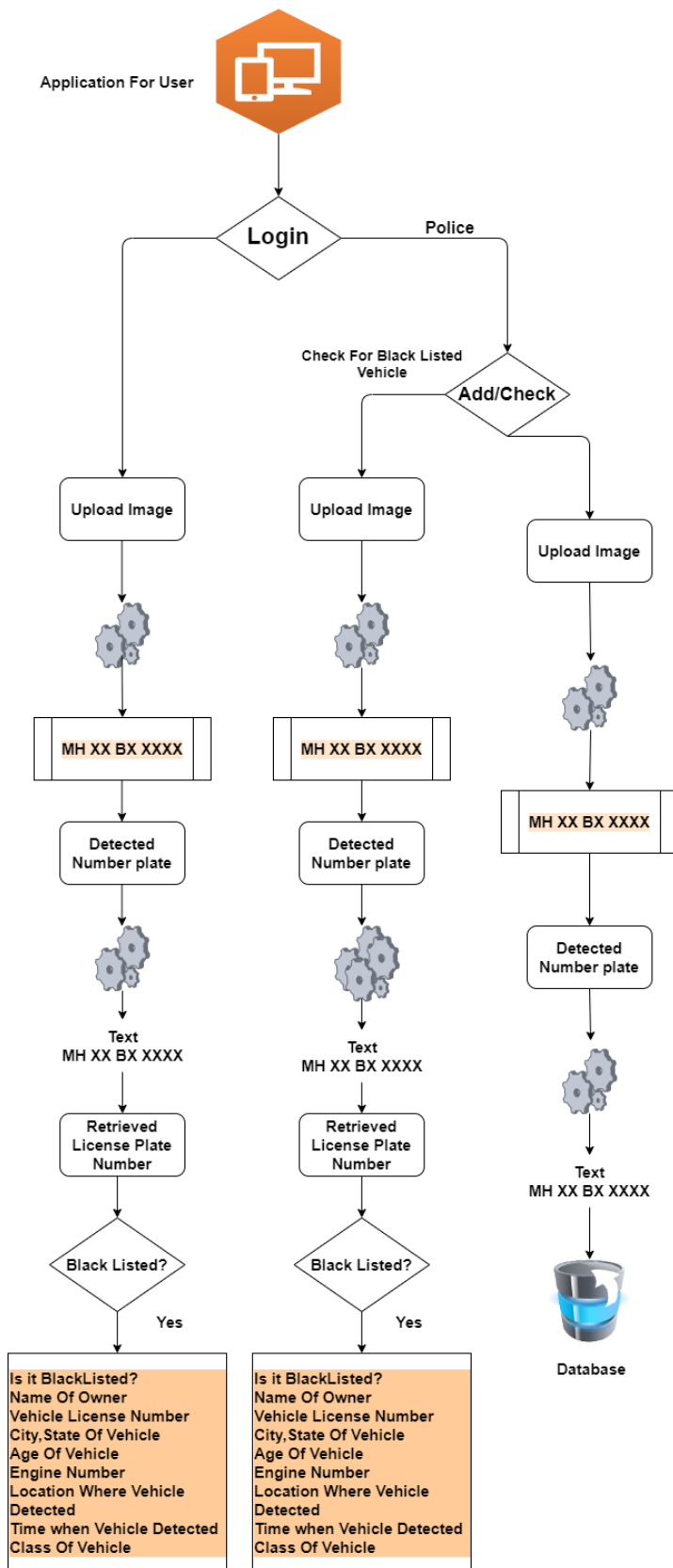
demonstrates different types of actors concerned during this system and actions related to them.
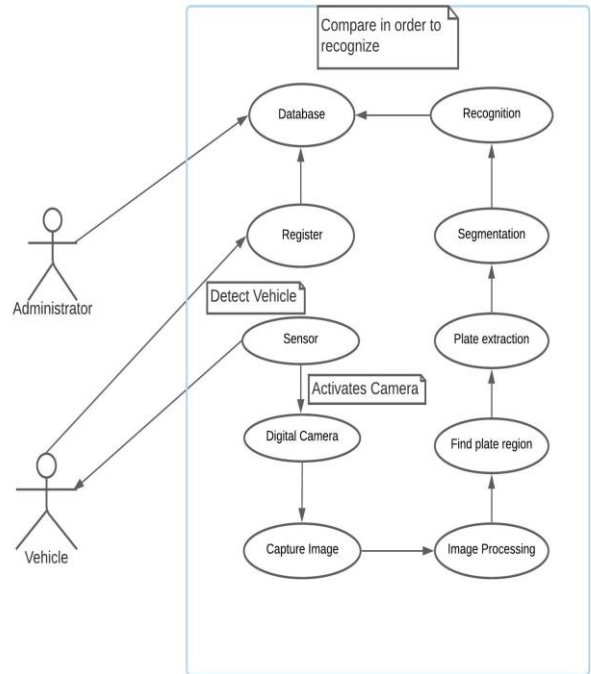

Fig. Use Case Diagram

While using this "Vehicle number plate detection, Identification and monitoring of vehicles for a criminal record" system all the actors (i.e., administrator) should be authenticated first and then only they can use application features or perform actions. police can view all the notification i.e is raised in web application and can take the action on it.

4 Modules:

4.1 Detection

This drawback is often tackled by exploiting the Detection approach wherever we'd like to a coach our model exploitation of the car/other vehicle pictures with number plates. This drawback is often resolved by an exploitation of OCR (Optical Character Recognition) which might be useful in extracting the character set characters from cropped a number Plate pictures.

It is often assumed that this resolution needs to be embedded with an internet application moreover wherever once the camera captures the image of the vehicle, the backend would decide the answer and output the contents to the user.

Fig 3 shows the use case of the proposed system for the Vehicle number plate detection, Identification and monitoring of vehicles for a criminal record and

4.2 Identification

After coaching, pass the check pictures for YOLO. Result obtained may be a JSON file with coordinates of range Plate per image. Using these results, cropped the amount Plate portion and keep in an exceedingly separate folder

4.3 Monitoring

The Monitoring part will identify the extracted text is present in blacklisted database or not If yes, then the system will notify to the police the information of blacklisted vehicle those are the "Name of the Owner", "Vehicle license Number", "City", "State"," Age of Vehicle", "Engine Number", "Location where the vehicle detected", "Fuel Type".

4.4 web application

Web application that is provided below for monitoring of vehicles.

5 Results Output:

The first and the main focused point project is to its implementation part and here is the start of an implementation which start with mainly concentrate on two steps, first is to check the number plate and the second is to detect all the numbers and letters to identify each number separately. This system is prepared based on images and can be easily applied to toll systems for the use of documenting access of passing services, security usage of roads, and also to prevent the car theft issues.

A] Sign Up and Sign In
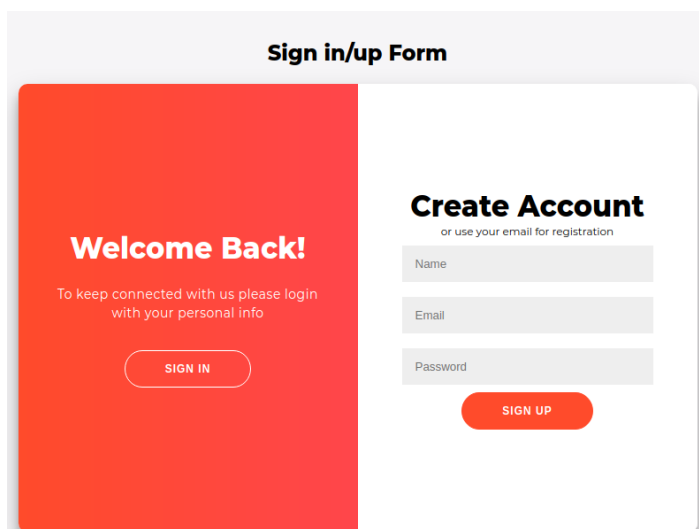
The sign-up page will consist of an end user registration for the first time to the site where the user can register themselves by providing their details

which will consist of the user's name, email and the password.
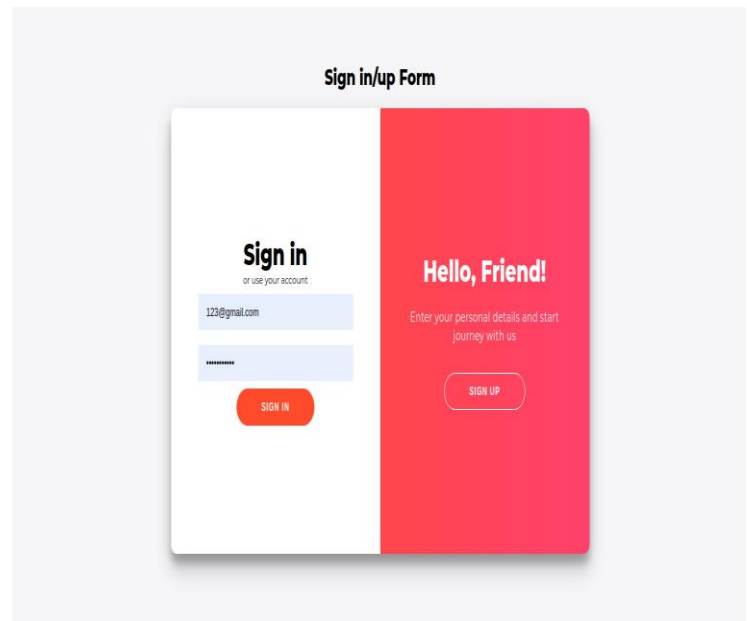
B] Upload Video/Image

Here is the main part of implementation from where the user can upload the image and the video of the vehicle and after submitting you will get to the next page which will give you the detailed information of the relevant vehicle.
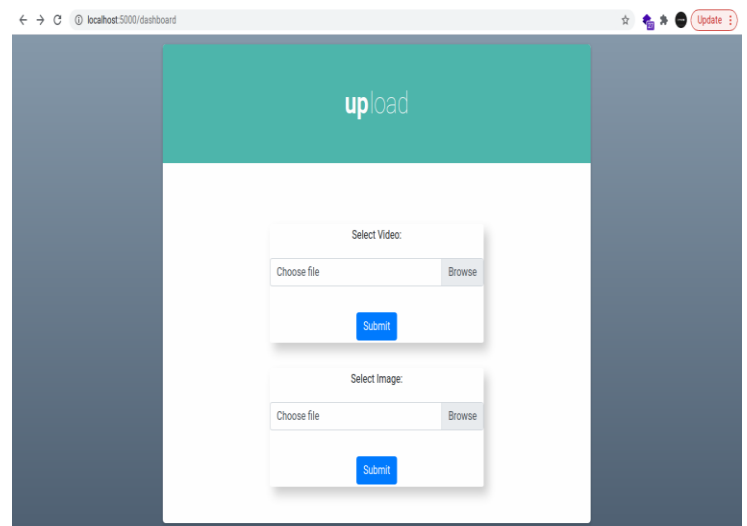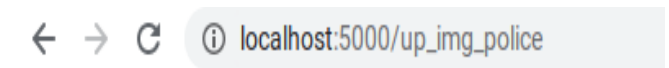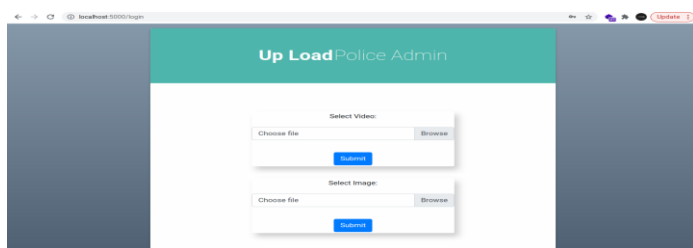

C] Vehicle Data

This vehicle detail page consists of all the required information which can give the overall details of particular vehicle this information will consist of all registration details and engine details

D] Admin Dashborad

The below image will consist of the notification part which will give a pop-up message of the record of blacklisted the vehicle from where a police officer can make across the verification by checking its details and can mark the vehicle as a blacklist.
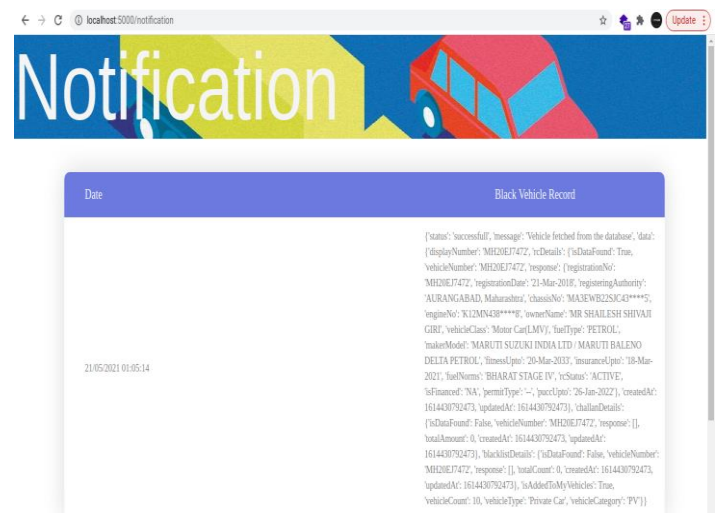
5.1 Scope and Limitation:

The limitations of this system are that we can not process random images like a dog, a cat as an input. In the case of ANPR, sometimes cars in some particular angles are also considered, and rotated images are also allowed. In some cases, the quality of images is bad because of rain or due to any other issue, then such images can not proceed further.

This system only covers crime-related incidents but it can be extended to other applications like a fire emergency and medical incidents. We can use this system in a surveillance Of Restricted Areas Like the Army And Governmental Organizations.

6. CONCLUSIONS

From the consideration of all the above points, we conclude that in this framework, free and open source technologies are matured enough for the scientific computing domain the system works satisfactorily for wide variations in illuminating condition and also works on different types of number plates commonly found in India and it can be a better alternative to the existing system The only purpose of the system it collects the data and is to help people feel more secure while they're on the road and punish violence.

REFERENCES

[1] T. Naito, T. Tsukada, K. Yamada, K. Kozuka, and S. Yamamoto, "Robust License-Plate Recognition Method for Passing Vehicle Under Outside Environment", IEEE Trans. On Vehicular Technology, Vol. 49, Vol. 49, No.6, November 2000, pp. 2309-2319.

[2] Chirag Parel, Dr. Atul Patel, Dr. Dipti shah, "A Novel Approach for Detecting Number Plate Based on Overlapping Window and Region Clustering for Indian Conditions" April 2015.

[3] Abo Samra and F. Khalefah ," Localization of License Plate Number Using Dynamic Image Processing Techniques and Genetic Algorithms" IEEE transactions on evolutionary computation, vol. 18, no. 2, April 2014.

[4] Mr. G. T. Sutar and Prof. Mr. A.V. Shah "Number Plate Recognition Using an Improved Segmentation" International Journal of Innovative Research in Science, Engineering and Technology (An ISO 3297: 2007 certified organization) Vol. 3, Issue 5, May 2014.

[5] Muhammad Tahir Qadri, Muhammad Asif "Automatic Number Plate Recognition for Vehicle Identification using OCR Technique" 2009 International Conference on Education Technology and Computer, IEEE Computer Society DOI 10.1109/ICETC.2009.54.

[6] Hitesh Rajput, Tanmoy Som, Soumitra Kar, "Using Radon Transform to Recognize Skewed Images of Vehicular License Plates", Computer, vol. 49, no. , pp. 59-65, Jan. 2016, doi:10.1109/MC.2016.14

BIOGRAPHIES

Prof. Aarti Gaikwad
Dept. Of Information Technology
DYPCOE, Akurdi, Pune.

Shubham Sangle
Dept. Of Information Technology
DYPCOE, Akurdi, Pune.

Samiksha Deshpande
Dept. Of Information Technology
DYPCOE, Akurdi, Pune.

Pranali Survashi
Dept. Of Information Technology
DYPCOE, Akurdi, Pune.

Pooja Kanwate
Dept. Of Information Technology
DYPCOE, Akurdi, Pune.

Apurv Tayade
Dept. Of Information Technology
DYPCOE, Akurdi, Pune.