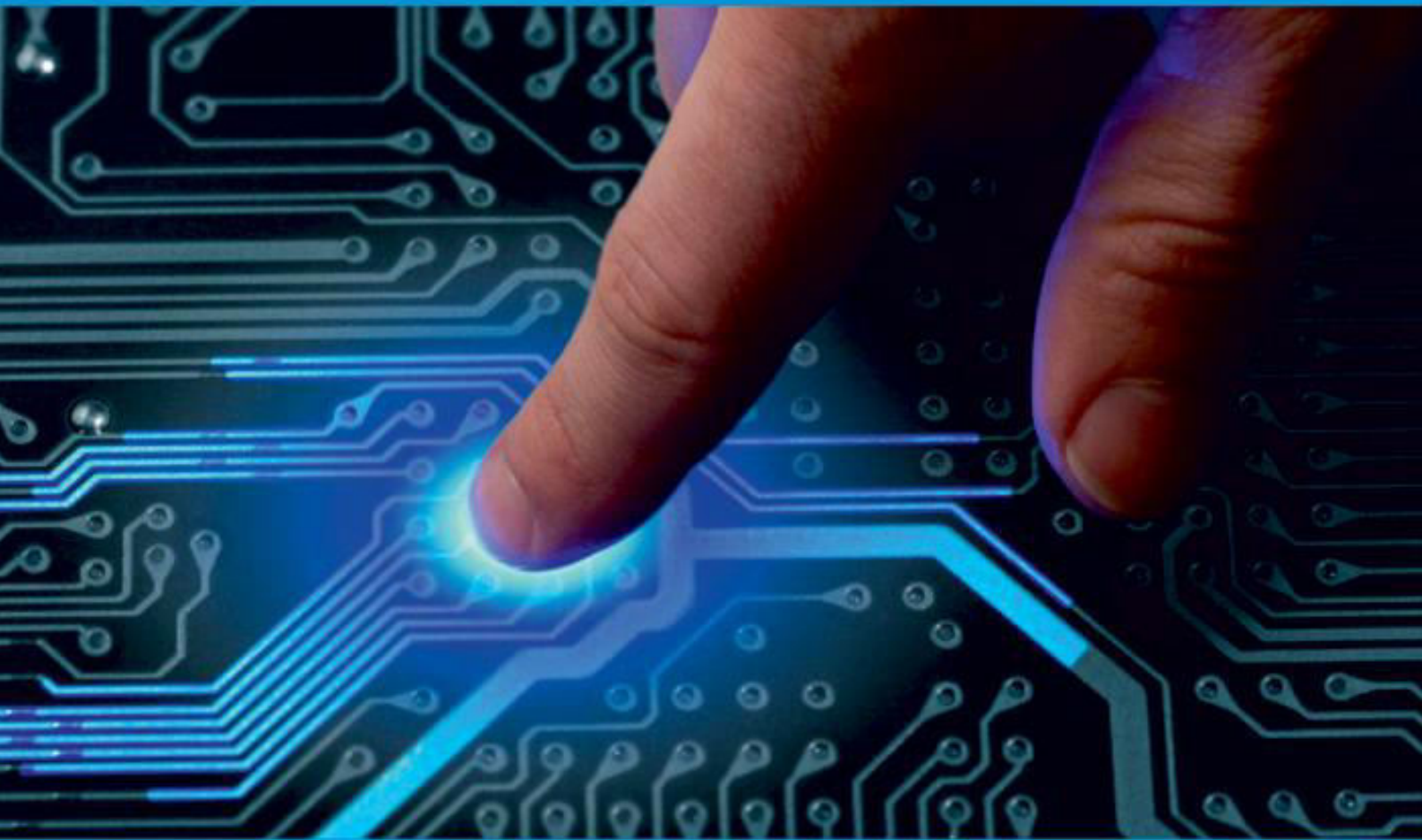




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Automatic License Plate Recognition System

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ABSTRACT: - Automatic Number Plate Recognition system is an image processing technology. The number plate reorganization system which will recognize the characters from number plate. In this technology we use the number plate of a vehicle to recognize the vehicle. ALPR system is used in various areas nowadays such as automatic toll collection, parking system, Traffic control, Border crossings, stolen cars tracking, maintaining traffic activities and law enforcement etc. several techniques have been proposed for number plate recognition, each one having its own advantages and disadvantages.

A number plate recognition system employs image processing techniques, to help to identify the vehicles through their plates. Number plate recognition is a process, where first the license plate region is localized in a car image supplied by one camera or by multiple cameras, and then the characters on the number plate are identified by a character recognition system. The number plate recognition can be done in three major steps: Localization of the number plate, extraction of the number plate characters, and recognition of the characters using a suitable identification method. ALPR technology is a tool applied to smart cities in investigation and crime prevention. It has been widely used in toll booths on highways and parking management systems which have a rigid shooting angle and lighting surroundings.

If the vehicle is an un-authenticate, then it becomes a very tedious and time-consuming task and very hard to search for that vehicle (Number plate). Recognized number plate displays on graphical user interface and stored in a database with time and date for further use. It will be beneficial to reduce the problem such as traffic violation cases and to enhance security in parking areas. Computer vision technology plays a very pivotal role in this project for moving vehicle number plate character recognition. Image from video sequence is taken to recognize the plate characters. Character recognition technique from the number plates based on the aforementioned system recognizes and differentiates between genuine and fake number plates.

I. INTRODUCTION

With rising traffic and the number of vehicles on roads, it is getting very difficult to manually traffic rules and handle laws, regulations and even for smooth traffic movement. Management of transportation are tedious and time-consuming tasks. If it is completely operated manually that reflects difficulties and enormous errors. Thus, it creates an urge for an advancement of technology for traffic management and monitoring. Nowadays traffic monitoring is done by computers using ML and image processing. It saves manpower and accomplishes some complex tasks like counting vehicles on highways, parking violation alerts, database management, blacklisted and stolen vehicle alerts etc. Toll-booths are installed on freeways and parking complexes, where the vehicle has to stop to pay the toll or parking charge fees. By this we can even record the routes of the particular vehicles. Also, Traffic maintenance systems are constructed on freeways for analysis of vehicles moving at high speed which is against law. Even at the gates of the government offices and colleges if this system is implemented, we can keep the record of the vehicles entering the premises and if unknown or suspicious vehicle is detected the strict actions can be taken against it. Due to the increase in the number of vehicles keeping the record of each becomes burdensome on the manpower but using this system we can store this data properly into the database effectively.

A. Motivation

BASIC MOTIVATION behind our project is With an everyday increase in the number of cars on our roads and highways, we are facing numerous problems, for example: ' Identification of stolen cars ' Smuggling of Cars ' Invalid license plates ' Usage of cars in terrorist attacks/illegal activities So To address these issues, we intend to develop a prototype system which can perform license plate recognition : 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 have no standard size and font so it becomes very difficult to read and recognize the characters of the number plate. So, a flexible algorithm is required to solve this problem.

B. Objective

The aim of this project is to be able to develop a system for ALPR from High Resolution (HR) digital images by combining advanced techniques with some of the most powerful algorithms. Hence, the most important objectives within the project are:

- To analyze the different existing techniques used in ALPR in order to select the most efficient and appropriate ones. To learn to use these techniques and make the most of their capabilities.
- To analyze the different methods and choose the most suitable ones for ALPR. To learn how they work and to adapt them to the ALPR application.
- To develop an efficient, fast and reliable ALPR application that is able to compete with other recently developed ALPR systems of similar characteristics.

II. LITERATURE SURVEY

The SVM has been proposed.OCR (Optical Character Recognition) is programmed perusing of optically recognized report content/picture materials to make an understanding of comprehensible characters to machine-significant codes.

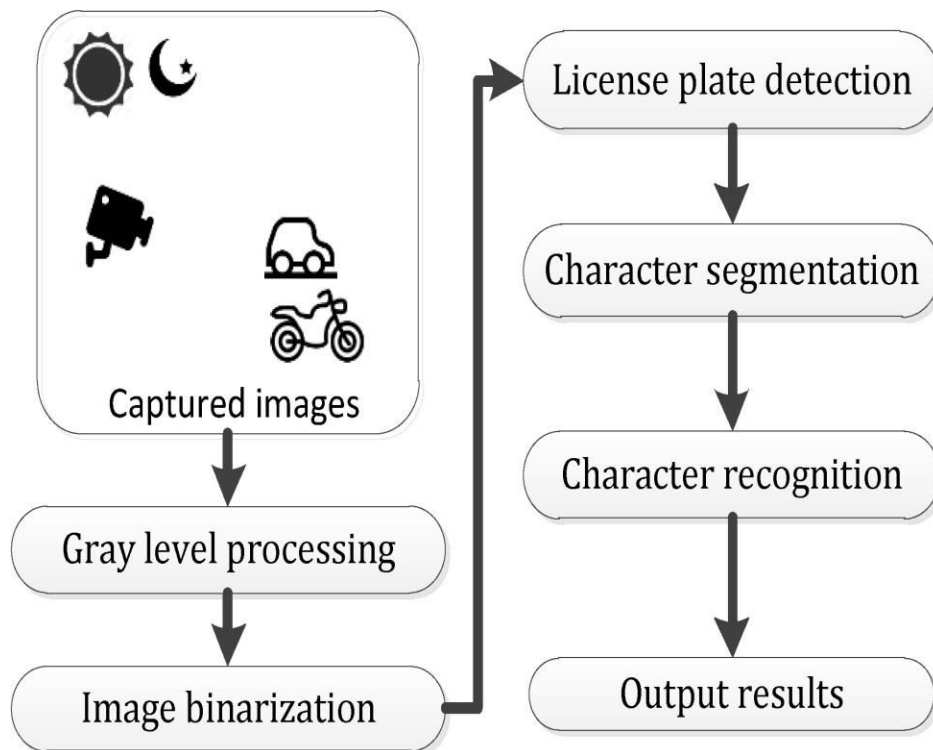




Image sets of Twenty-six alphabets and Ten numbers of different sizes and shapes are created. All these binary images are used for the training phase. Each image also given a unique label which will useful while classifying the alphanumeric character in the test image. The classification process is done using SVM (Support Vector Machine) classifier. Image pre-processing techniques like converting to grayscale and adaptive histogram equalization are done to get a binary version of test image. HOG features are found for each character and it is classified using the Support Vector Machine classifier to check if it belongs to the dataset we used while training. This histogram gives information about the plate in the cropped image. After that in the image, again thresholding, histogram equalization is done on this image (which contains only number plate), and subsequently connected component analysis is done and characters are filtered using height and width. Then each valid character is then identified using Optical Character Recognition (OCR) and the final number plate characters are shown as the output.

A. Advantages

- This system decreases the manpower required to keep the record.
- High accuracy reading and 24/7 operation.
- By using this no toll booths will be required.
- Can transmit real time stamp of entry/exit of the vehicle to the database.
- Enhanced Security & Safety.
- Provide evidence
- Pre-paid parking's members can be easily differentiated from non-members

III. PROBLEM STATEMENT

Automatic Number Plate Recognition System (ALPR) is the identification system of vehicles. It is an image processing technology used to identify the vehicles only by their number plates. ANPR plays a major role surveillance of illegally parked vehicle, and management of parking areas. So, every vehicle has a unique number plate so it can be identified by its number plate. The classification is utilized for the electronic toll-collection system (ETC) and to display available parking spaces to vehicles. The identification is also employed for managing parking facilities, monitoring and analysis of traveling time, and security systems such as monitoring of unauthorized vehicles entering private areas.

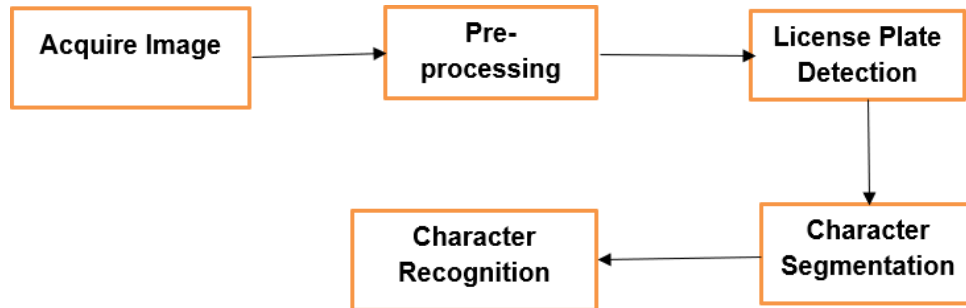
IV. PROBLEM SOLUTION

Automatic License Plate Recognition (ALPR), is software used to recognize the number plates automatically by performing optical character recognition on images to read the license plates of vehicles. A ANPR system takes an image as input (i/p) and returns the decoded vehicle plate. This system will help to increase the security level. It will make it easy to keep watch 24/7 and will easily save the data of the vehicles.

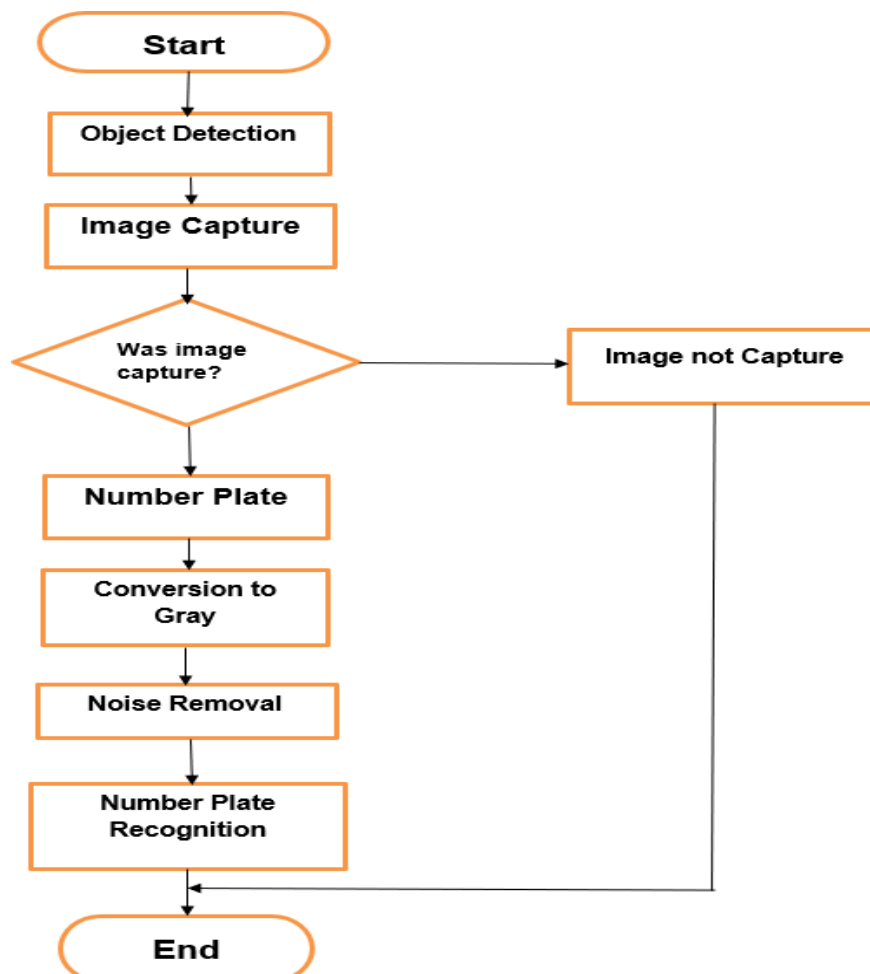
V. PROPOSED OUTCOME

- It saves manpower and also accomplishes some complex tasks like counting vehicles on highways, parking violation alerts, database management, blacklisted and stolen vehicle alerts etc.
- At the gates of the government offices and colleges if this system is implemented, we can keep the record of the vehicles entering the premises and if unknown or suspicious vehicle is detected the strict actions can be taken against it.
- Due to the increase in the number of vehicles keeping the record of each becomes burdensome on the manpower but using this system we can store this data properly into the database effectively.
- Identification of stolen vehicles, smuggling of vehicles, detection of invalid license plates, usage of vehicles in terrorist attacks/illegal activities can be monitored and stopped through use of ALPR system.

VI. DATA FLOW DIAGRAM



VII. SYSTEM BLOCK DIAGRAM





VIII. CONCLUSION

The system will work on satisfactorily for wide variation of conditions and different types of number plate. The system works agreeably for wide variation of condition and distinctive shorts of number plate. The system is implemented, executed and performance is tested on genuine images. Continuously growing world population brings along with it a rapidly rising number of vehicles. Managing traffic of such a growing number of vehicles is a big problem especially in metropolitan cities. Implementing Automatic Number Plate Recognition System can be a solution for sustainable detection of traffic violations. The extracted license plate number can then be used to look up for its owner in the existing visitor's DB (database). An automatic alert can also be sent to the owner right away. This will result in fastening the procedure of looking for traffic violators. In this way implementing Automatic Number Plate Recognition System for automatic detection of traffic violations can be a step towards sustainability which can be successfully implemented in an enclosed colleges and space like corporate offices due to its high accuracy.

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