Automatic Number Plate Recognition

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Abstract- *Licence Number identifies the Vehicle uniquely from one-another. Automatic Number Plate Recognition (ANPR) is a kind of image processing technology for recognizing the vehicle number plate. This system also offers users to place, mark out and monitor moving vehicles automatically by extracting their number plates. It also plays an important role in intelligent traffic control system. This research presents a prosperous method to implement one of the applications of Number plate recognition. That is, in an apartment or any environment where only some Authorised Vehicles have permission to move in. In the existing system, we do not have track of whose Vehicle is entering the environment (eg. Apartment). In this proposed system, we intent to extract the Number from the Number Plate of the Vehicle and check with the Authorised Vehicle list. If the Number is Authorised then we prompt the Vehicle to "Move in", and else a notification will be pushed to the Head of the Apartment.*

Keywords- Number plate, Authorized Vehicle , Unauthorized Vehicle, Notification.

I. INTRODUCTION

The control and surveillance systems rely heavily on car recognition. Number plates, which feature a unique combination of alphabets and numbers, are used to identify automobiles. However, manually recognizing all of the parked or passing car number plates is a difficult and time-consuming task for people. We take a training-based approach to vehicle number plate identification in this study and use it the real-time. The major goal of our research is to develop a reliable number plate recognition model that works in a variety of lighting conditions and angles. We built our model by employing deep learning methods to train on our manually gathered automobile number plate dataset and retrieve vehicle details. It will use (OCR) Optical Character Recognition and Neural Network to track down the vehicles' licence plates. After receiving the image, we apply image processing ideas employing teserract to display car information.

II. OVERVIEW

The system of vehicle number plate detection and recognition is used to identify plates, then to recognize the plates, which entails extracting text from an image, and all of this is made possible due to deep learning techniques. The numerals on the licence plate are linked to some vehicle information. We use this Number of the Vehicle to check whether it is Authorized or not.

III. SCOPE OF THIS PAPER

Because it is impossible to determine which strategy is superior, several publications based on steps are analyzed and classified based on the methodology used in each approach. When available, parameters such as speed, accuracy, performance, image size, and platform are presented for each approach. The survey of commercial items is beyond the scope of this paper because these goods often claim greater accuracy than is true for promotional objectives.

IV. NUMBER PLATE DETECTION

The majority of number plate identification algorithms are classified into multiple categories depending on different methodologies. The following variables should be considered while detecting a vehicle number plate:

1) Plate size: In a vehicle image, a plate might be of various sizes.
2) Plate placement: a licence plate can be placed anywhere in the vehicle.
3) Plate background: Depending on the type of vehicle, the background color of a plate can vary. For example, the background of a government vehicle number plate may differ from that of other public cars.
4) Screw: A plate may have a screw, which may be regarded as a character. The picture segmentation approach can be used to extract a number plate.

V. PROPOSED SYSTEM

The details of the suggested system for licence plate recognition are discussed in this section. The five steps of AIRS that use number plate detection techniques are as follows: (1) Vehicle image capture (2) Number plate detection (3) Character segmentation and recognition (4) Check with the Authorized list of Vehicles (5) If Unauthorized then push

notification. . To extract the characters from the number plate, we do image processing utilizing tesseract and edge detection algorithms after getting the image. On the test document, the characters taken from the number plate are saved. Each space is also given its own personality.

- We propose a method for automatically detecting vehicle number plates in real-time and retrieving vehicle-related information.
- The proposed method uses background removal to detect the vehicle initially.
- Following detection, it will use (OCR) Optical Character Recognition and Neural Network to track down the vehicles' licence plates.

VI. LICENCE PLATE LOCALIZATION

The initial stage in the licence plate identification process is to locate the arriving vehicle's licence plate within the captured image. The major focus of attention in the licence recognition task is the licence plate region. The remainder of the image is disregarded because it is unnecessary to our task.

VII. IMAGE PRE PROCESSING

RGB To Gray Conversion- Using a color image to identify crucial edges and other features is ineffective. Because processing an RGB image is difficult and time-consuming, we must first convert a colored image to a grayscale image.

Image Enhancement- The goal of adaptive histogram equalization is to improve image contrast (gray color image). We create numerous histograms, each for a different part of the image. This is helpful since a single histogram in a traditional histogram represents the full image.
Median Filtering-To remove noise in the image.

VIII. EDGE DETECTION

A border between two locations with somewhat different grey level qualities is referred to as an edge. It looks for inconsistencies in intensity values. The first stage in plate recognition is to determine the plate size (rectangle), therefore we must first determine the rectangular plate's edge. The edges of the image are highlighted using the sobel operator. As a result, the amount of data in the image is reduced, and the essential data is processed for further use.

IX. CONCLUSION

Convolutional Neural Networks are a very strong and efficient algorithm that may be implemented on an embedded device. The aforementioned tests can be used to verify the algorithm's efficacy. The results of all of these tests are remarkably similar. According to algorithm tests, the training of letters and numbers datasets acquired from various angles is a critical parameter to consider.

This intelligent vehicle monitoring and security system will assist vehicle owners in making the most secure and efficient use of their cars.

X. ACKNOWLEDGMENT

We sincerely thank our project guide Mrs. Devilakshmi for all her guidance and support throughout the work of the paper.

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