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Vehicle Tracking Using Image Processing

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Abstract: Stealing of vehicles is very common now days. It is very complicated to track a vehicle without adding any tracking device. We can easily track a vehicle if there's some tracking device integrated with it, but problem with tracking device is it can be easily removed or deactivated. Instead of using any device for tracking, we can track vehicle number plate using CCTV footage. For this purpose we can use android app. The victim can register on the app with vehicles number with other information. As soon as he registers on the app, the information will be stored on the server. All the CCTV's connected to the server will look for the information in the live time using Image processing and will respond to the server as soon as it scans the mentioned information. The server will then send a notice to the user with latest information given by CCTV. Using this technique, we can also solve the problem of ambulance management in traffic.
Keywords: Image Processing, CCTV, SVM, Stolen Vehicle Tracking, JAVA and ANPR.

I. INTRODUCTION

Automatic identification of vehicle data has been commonly used in the vehicle information system and intelligent traffic system. It has acquired more attention of researchers from the last decade with the advancement of digital imaging technology and computational capacity. Automatic vehicle detection systems are keys to road traffic control nowadays; some applications of these systems are traffic response system, traffic signal controller, lane departure warning system, automatic vehicle accident detection and automatic traffic density estimation. An Automatic vehicle checking framework makes utilization of video information gained from stationary movement cameras, performing causal numerical operations over an arrangement of outlines got from the video to gauge the quantity of vehicles display in a scene. It is only the capacity of consequently remove and perceive the activity information e.g. add up to number of vehicles, vehicle number and name from a video. Checking vehicles gives us the data expected to get an essential comprehension over the stream of activity in any district under observation. Along these lines, the primary information we have attempted to accumulate is tallying of vehicles from accessible movement recordings from different libraries. In every video outline, Gaussian blend show separates protests in movement from the foundation by following identified protests inside a particular locale of the edge, and afterward forgetting about is conveyed.

II. GOALS AND OBJECTIVES

A. To provide solution aimed at tracking the missing or stolen vehicles.
B. The system is based on a dedicated image recognition application running on a Android system smart phone.
C. The system is also based on processing image of the number plate captured by the CCTV camera.
D. Image recognition results are communicated by means of messages containing location of the vehicle.
E. It can also detect an ambulance and can manage the traffic to give side/way for it.

III.PROBLEM STATEMENT

In our everyday life, a lot of vehicles get stolen or go missing and tracking them is a challenging task. It is very time consuming and no positive result is obtained. Even if we use tracking devices, they can be easily removed and so we need a proper technique for it.

IV.KEY-WORD DESCRIPTION

A. Image Processing

Image Processing is a strategy to play out a few operations on a picture, so as to get an improved picture or to remove some helpful data from it. It is a kind of flag handling in which input is a picture and yield might be picture or attributes/highlights related with that picture.

B. SVM

Support Vector Machine" (SVM) is a supervise machine learning algorithm that is used in both regression and classification challenges. Conversely, it is generally used in many classification problems. In this type of algorithm, we can plot each and every

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data entry as a spot in number of dimensional space with a value of each characteristic being a value of the particular coordinate. Then, by performing classification we find a hyper-plane which differentiate two classes splendidly.

C. JAVA

Like any programming language, the Java language has its own structure, syntax rules, and programming paradigm. The Java language's programming paradigm is based on the concept of OOP, which the language's features support[6].

The Java language is a C-language derivative, so its syntax rules look much like C's. For example, code blocks are modularized into methods and delimited by braces ({ and }), and variables are declared before they are used[6].Structurally, the Java language starts with *packages*. A package is the Java language's namespace mechanism. Within packages are classes, and within classes are methods, variables, constants, and more. You learn about the parts of the Java language in this tutorial[6].

D. ANP

Automatic number-plate recognition (ANPR) is an innovation which utilizes optical character acknowledgment on pictures to peruse vehicles number plate. It can utilize street run implementation cameras, cameras or existing shut circuit TV particularly intended for the obligation. ANPR is utilized by police far and wide for law purposes, including to check if a vehicle is enrolled or authorized or not. It likewise utilizes electronic toll gathering on streets and as a technique for arranging the developments of activity. Automatic number plate recognition can be utilized to store the pictures caught by the cameras and also the content from the number plate, with some configurable to store the photo of driver. Frameworks usually utilize infrared lighting to enable the camera to take the photo whenever of day or night. ANPR innovation must consider plate varieties from place to put.

V. RELEVANT MATHEMATICS ASSOCIATED WITH THE PROJECT

A. The System Description

Set Theory

et S be the Moving Object detection of the Final set. S=————————.

Identify the input as

S=V.

V=V1,V2,V3,V4,V5,—- —

V Given image captured From CCTV Camera.

B. Identify the output as

DO , AR

DO=DO1,DO2,DO3,—— DO given Detected object.

AR=AR1,AR2,AR3,—— AR Given the alert Report

C. Identity the Function as F

F=F1(),F2(),F3(),F4(),F5(),F6(),——.

F1(V) :: Capture Image From Camera.

F2(V) :: Divide into Frames.

F3(V) ::Image Processing.

F4(V) :: detect object.

F5(V) :: analysis and monitoring For particular time.

F6(V) :: Data send to the main Server/Database.

F7(V) :: Generate the alert.

F8(V):: Send alert.

F : Failure State.

VI. LITERATURE REVIEW

1) In this paper, we address the issue of detecting vehicle from video frames. Although various researches have been done in this area and many methods have been implemented, still this area has room for improvements. With a view to do improvements, it is proposed to develop an unique algorithm for vehicle data recognition and tracking using Gaussian mixture model and blob detection methods. First, we differentiate the foreground from background in frames by learning the background. Here,

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foreground detector detects the object and a binary computation is done to define rectangular regions around every detected object. To detect the moving object correctly and to remove the noise some morphological operations have been applied. The results were encouraging and they got more than 91 percent of average accuracy in detection and tracking using the Gaussian Mixture Model and Blob Detection methods.

2) In this paper, a novel approach to Vehicle Make Model Recognition in CCTV video footage is presented. CPD (coherent Point Drift) is used to effectively remove skew of vehicles detected as CCTV cameras are not specifically configured for the VMMR (Vehicle Make and Model Recognition) task and may capture vehicles at different approaching angles. Also, a complete VMMR System has been presented. The proposed VMMR system returns the makes and model of the vehicles detected in given video. The VMMR system began by automatically detecting a number plate from a video frame, the location of the number plate was used subsequently to select a region of interest. It was important to treat the same vehicle across multiple frames as a single vehicle; hence an object tracker was used to track the detected number plate across multiple frames. A static region of interest was selected above the number plate and motion segmentation used to adjust this static region if necessary. LESH Features were extracted from the region of interest and a SVM was used to classify the feature, assigning it a label. The final label was decided using multiple frames from one vehicle object. A number of experiments were carried out on the proposed system using a test set that comprised of low quality CCTV videos.

3) In this paper we study about Automatic Number Plate Recognition (ANPR) which is an image processing technology which uses number (license) plate to identify the vehicle. The objective is to design an efficient automatic authorized vehicle identification system by using the vehicle number plate. The developed system first detects the vehicle and then captures the vehicle image. Vehicle number plate region is extracted using the image segmentation in an image. Optical character recognition technique is used for the character recognition. The resulting data is then used to compare with the records on a database so as to come up with the specific information like the vehicles owner, place of registration, address, etc. This paper also presents a recognition method in which the vehicle plate image is obtained by the digital cameras and the image is processed to get the number plate information. A rear image of a vehicle is captured and processed using various algorithms.

4) In this paper, a wide spread survey of object detection and tracking methods have been presented. Merits and demerits of available methods of object detection, classification and tracking have been discussed. The background subtraction method is concluded to be the easiest method which gives the complete details about the object compared to frame difference and optical flow detecting methods. The kernel or contours based tracking require detection only when the object first appears on the screen whereas the point tracking involve detection in every frame. Future work should be efficient for proper understanding of different algorithms to reduce errors in tracking and to use most appropriate algorithm to decrease the time required for tracking of objects containing diversified characteristic videos. Object detection and tracking are the task that is important and challenging such as video surveillance and vehicle navigation.

5) In this paper, Automated Number Plate Recognition system would greatly enhance the ability of police to detect criminal activity that involves the use of motor vehicles. This paper discuses a method for the vehicle number plate recognition from the image using a special form of optical character recognition (OCR).ANPR systems use optical character recognition to read number plates through CCTV systems, which enables vehicle registration numbers to be stored, analyzed and retrieved, as required. These systems can be fully automated to operate 24/7 and monitor unauthorized parking and vehicle movements in environments such as Access control points, Distribution centers, Hospitals and car parking areas. The automatic vehicle identification system using vehicle license plate is presented. The system use series of image processing techniques for identifying the vehicle from the database. The camera used in this paper is sensitive to vibration and fast changing targets due to the long shutter time. The system robustness and speed can be increase if high resolution camera is used. The statistical analysis can also be used to define the probability of detection and recognition of the vehicle number plate.

VII. SYSTEM ARCHITECTURE

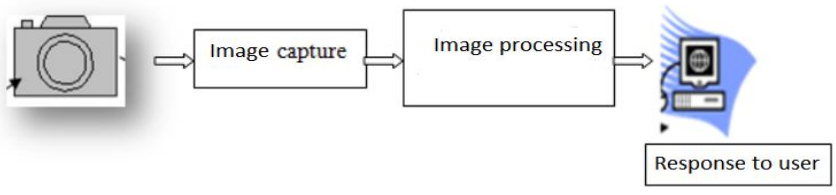


Fig. System Architecture

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The victim can register on the app with vehicles number with information. As soon as he registers on the app, the information will be stored on the server. All the CCTVs connected to the server will look for the information in the live time using Image processing and will respond to the server as soon as it scans the mentioned information. The server will then a notification will be seen to the user with latest information given by CCTV.

VIII. CONCLUSION

In vehicle following utilizing picture handling in which the vehicle plate picture is gotten by the advanced cameras and the picture is prepared to get the number plate data. A back picture of a vehicle is caught and handled utilizing different calculations. Advance we are intending to learn about the attributes required with the programmed number plate framework for better execution.

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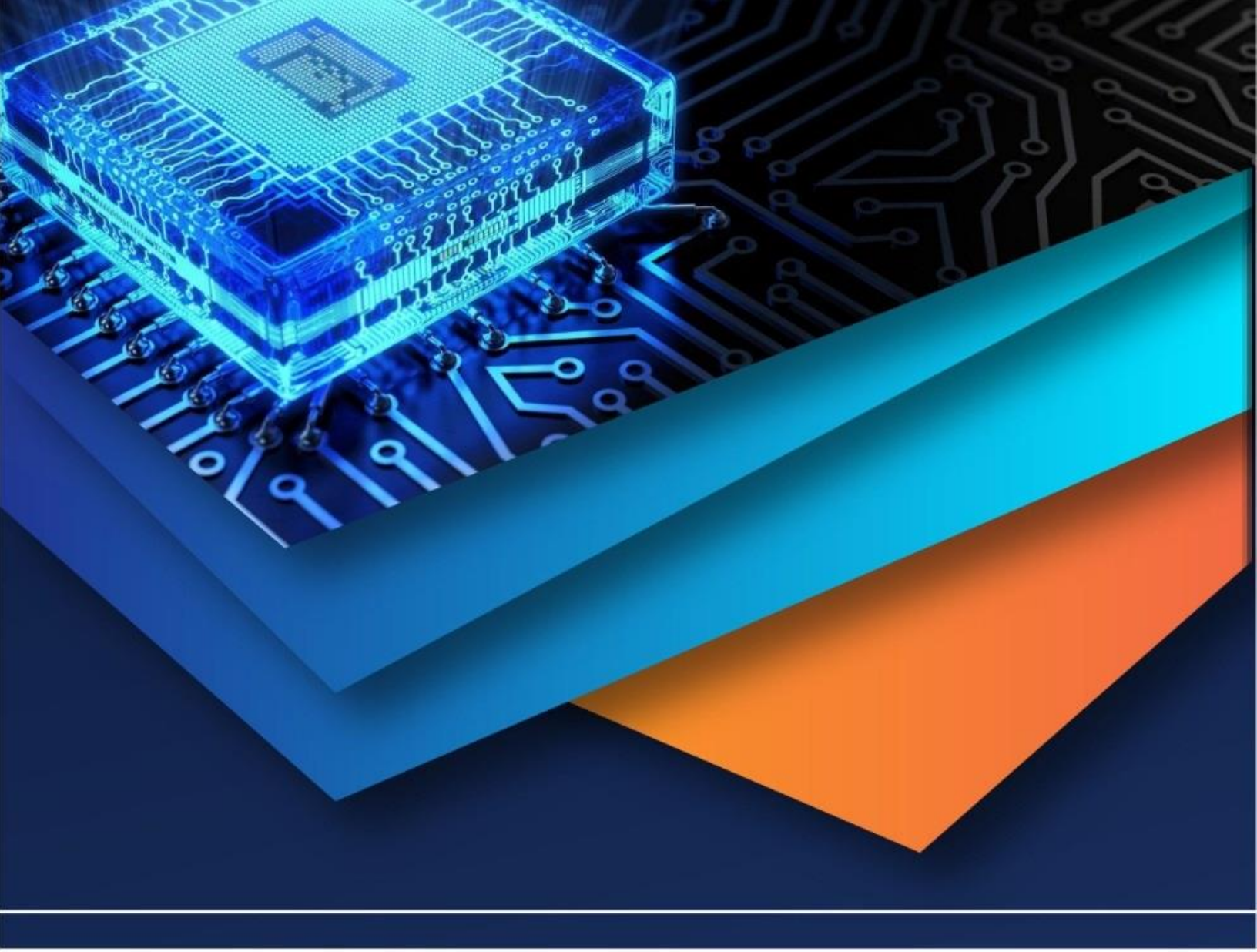
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