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FAKE LICENSE PLATE NUMBER RECOGNITION USING GPS LOCATION

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Abstract— In this study, we present a technique called Real-Time Number Plate Recognition and Tracking System Using GPS, which enables automatic vehicle identification and tracking based on number plates on the vehicle. Fake license plate number is detected based on GPS location. The same license plate number may present in the two locations at same time in such case we can identify the fake license plate number by using this technology. In some the cases the accust may have same identical color car and same model to fake the police. It is intended to improve security in a variety of locations, including parking lots, roads, and borders.

The system functions by taking pictures of the license plates of passing cars using roadside CCTV cameras. Following that, automatic computer vision techniques are used to analyze the photos in order to retrieve the data from the licence plate. The system is desired by law enforcement by comparing the number plate information with a database of registered vehicles. The system is capable of both vehicle identification and real-time tracking of the movement of the detected cars using GPS. This makes it possible for security staff to keep an eye on how car is moving about a specific region and spot any unusual activity.

The real- time number plate identification and tracking system has several uses in security and law enforcement. It will help us to locate the fraudlent vehicles so accurately and spotting and locating the cars that used in criminal activity, controlling traffic, and boosting security in sensitive places. The system, taken as a whole, is a useful tool for boosting security and safety in many situations It might fundamentally alter how we control law andimprove public safety. It is mainly developed to identify the fake vehicle having same model and having with the same fake number plate.

Keywords— License Plate, Open CV, SSD Mobile Net, GPS, OCR.

I. INTRODUCTION

Vehicle tracking is used in a broad variety of applications, including traffic data collection and intelligent transportation systems. Real-time license plate recognition is critical for security and law enforcement to locate desired vehicles. Several police departments employ number plate recognition to identify traffic or individual movements and to collect electronic tolls on pay-per-use roads. Because the number plate is the most well-known, major, and mandatory X identifier for automobiles, automated number plate recognition is useful for a variety of applications. Real-time Automated License Plate Recognition and monitoring of runaway automobiles is a cutting-edge technology that has the ability to greatly improve public safety and traffic management. The technology allows for the automatic identification and tracking of cars based on license plate numbers.

We will look at the major components, functionality, and applications of real-time Automated License Plate Recognition and vehicle tracking in this article. We will also go through the pros and drawbacks of this technology, as well as its potential influence on numerous businesses.

Real-time Automated License Plate Recognition and Runaway Vehicle Tracking:

Cameras, image processing software, and a database of registered cars are among the major components of the ALPR system. The cameras are used to take photos of passing automobiles' license plates, and image processing software pulls the license plate information from the image. The gathered information is then compared to a database of registered cars to establish if the vehicle is permitted to be on the road or if law enforcement is looking for it. The technology may also track the movement of designated cars in real time, allowing security officers to monitor vehicle traffic in a specific region.

Applications of Real-time Automated License Plate Recognition and Vehicle Tracking:

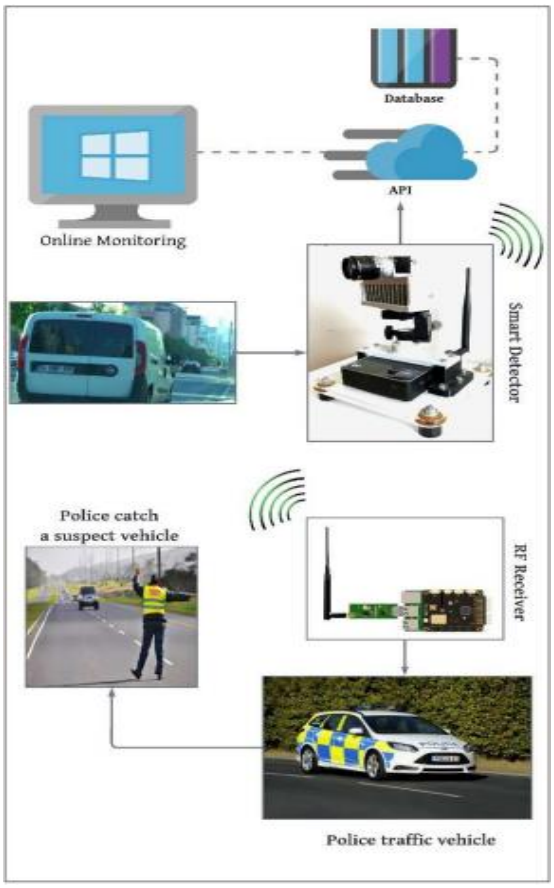
Law enforcement, traffic management, and security all benefit from real-time automated license plate recognition and monitoring of fleeing automobiles. For example, it can assist law enforcement authorities in detecting and tracking runaway automobiles engaging in illegal activity, managing traffic flow in congested places, and improving security in sensitive areas.

The Advantages and Difficulties of Real-Time Automated License Plate Recognition and Vehicle Tracking:

Real-time Automated License Plate Recognition and monitoring of evading cars provides several advantages, including greater security, improved traffic management, and higher efficiency in a variety of businesses. The technology can also assist security officers minimize their burden and enhance their efficacy in identifying and stopping illegal activity. However, the technology has various issues, including privacy concerns and the potential for exploitation. There are also technological issues with the system's accuracy and capacity to detect license plates in different weather and lighting situations.

Our system's smart detecting equipment will be implemented as far as possible on all main and minor roadways. Each gadget incorporates a camera, an industrial computer, and an RF wireless module., as shown in Fig. 1.

Given that the camera collects at least 80 frames per second, every movement in the road is easily detected. When motion is detected, the camera checks each frame for license plates, which it then recognizes and extracts. The clever detector will check the license plate number to see if the car is wanted. If it is, it will send a notice to the nearest police traffic car, allowing them to intervene and halt the vehicle. The smart gadget will send each recognition data to the server at the same time and save it in the database. The authorities have constant access to the data



The remainder of this paper is organised as follows. The literature review is presented in Part II. Existing system in part III. In section IIV, the recommended system model is then provided. Part IV offers a conclusion to the article.

II. LITERATURE SURVEY

The use of OpenCV for edge detection and mathematical morphology is explored in paper 1, which has the benefit of being simple to implement but the drawback of not having an automated approach. In paper 2, a pyramid network structure is presented that can extract both high-level and

low-level semantic characteristics. This structure has the benefit of a larger rotation angle but a longer run time. In article 3, SSD-MobileNet is used to identify the number plate in the first instance and is presented. It has the benefit of quickly detecting the automobile number plate and the drawback of having a low rotation angle. Convolutional neural network is addressed in article 4 to obtain the licence plate area and extract the deep characteristics of the region of interest. More precision and a drawback The system requires increased computing capacity. The You Only Look Once algorithm version-4 is used in paper 5. The higher rotation angle is a benefit, whereas the lengthy training period is a drawback.

"Automatic License Plate Recognition Using Sobel Edge Detection and SVM" by A. Elmahdy and M. El-Soudani. This paper proposes a license plate detection method that combines Sobel edge detection and SVM. "License Plate Detection and Recognition Using Edge Detection and Artificial Neural Network" by M. Nuruzzaman et al. This paper presents a method that uses edge detection and artificial neural networks for license plate detection and recognition. "Automatic License Plate Recognition Using Machine Learning Techniques and Edge Detection" by H. Ghorbel and A. Bouallegue. This paper proposes a method that uses machine learning techniques and edge detection for automatic license plate recognition.

Automatic License Plate Recognition System Using HOG Features and SVM Classifierby R. Singh and S. Kapoor. This paper presents a method that uses HOG features and SVM classifier for automatic license plate recognition. Vehicle License Plate Detection Using Image Processing Technique by S. Siddiqui et al. This paper proposes a method that uses image processing techniques such as binarization and contour detection for vehicle license plate detection.License Plate Detection and Recognition in Complex Scenes Using Gabor Filter and HOG Features by Y. Yuan et al. This paper presents a method that uses Gabor filter and HOG features for license plate detection and recognition in complex scenes. Vehicle License Plate Detection Using Hybrid Approach of Edge Detection and Template Matchingby A. Priyadharshini and R. Balamurugan. This paper proposes a hybrid method that combines edge detection and template matching for vehicle license plate detection. Automatic License Plate Recognition Using Haar-Like Features and SVM Classifier by M. Dehghani et al. This paper presents a method that uses Haar-like features and SVM classifier for automatic license plate recognition. "License Plate Recognition System Based on Morphological Operations and Connected Component Labeling" by M. S. Bin and S. S. Kumar. This paper proposes a method that uses morphological operations and connected component labeling for license plate recognition.

III. EXISTING SYSTEM

A model based on a CNNis built in the current way to identify the licence plate. To use a CNN to detect vehicle number plates, you would first need to train the model using a large dataset of images that include vehicles with number plates. The training data should include a wide range of different lighting conditions, angles, and vehicle types to ensure that the model is robust.Once the CNN has been trained, it can be used to classify new images and identify the location of the number plate within the image. This can be done using techniques such as object detection and localization.

The training and testing procedure in the current system makes use of the darknet.

Darknet is an open-source neural network framework that is primarily used for object detection, recognition, and classification tasks. It is known for its speed and efficiency and has been widely used in various computer vision applications.In the context of vehicle number plate detection, Darknet can be used to train and test a CNN-based model. To use Darknet for this purpose, you would need to first prepare your training data and create a configuration file that specifies the structure of your CNN.You would then use Darknet's training script to train the model using the training data. The training process involves adjusting the weights of the CNN to minimize the error between the predicted output and the ground truth labels. Once the model is trained, you can use it to test new images and evaluate its performance.Darknet can also be used for other tasks related to vehicle number plate detection, such as preprocessing the images to enhance their quality, or post-processing the detection results to filter out false positives.

In comparison to other deep learning algorithms, the processing frame count is larger.A Convolutional Neural Network is a type of neural network that is commonly used in image processing applications. It is a type of deep learning algorithm that is especially useful for analyzing visual imagery.

The disadvantages of the approach are that training takes longer and this technique required more computing resources.

IV. PROPOSED SYSTEM

This project explains how to use OpenCV to recognize licence plates. For the purpose of recognizing number plate numbers, we trained the character and number for each plate. Yolo (you only look once) is employed to teach more characters and numbers, and it is utilized to train images. For the testing image, we used background removal and binarization to identify the number plate number. Ultimately, the number plate number may be recognized. GPS technology is used to identify location-based behavior that shares a licence plate, same license plate number is present in two different location we can identify forgery or original

YOLO DESIGN MODULE

YOLO (You Only Look Once) is a real-time object detection system that uses deep learning algorithms to detect objects in images or videos. YOLO is a popular model in the computer vision field because it is very fast and can achieve high accuracy. Steps involved in using YOLO for object detection in images:

1. Preprocessing the image: The first step is to preprocess the input image to make it compatible with the YOLO model. This involves resizing the image to a fixed size, normalizing the pixel values, and converting the image to the correct format.
2. Loading the YOLO model: The YOLO model is typically pre-trained on large datasets of annotated images, such as COCO or VOC. You can load the pre-trained model using popular deep learning libraries such as TensorFlow or PyTorch.
3. Running the model: Once the YOLO model is loaded, you can use it to detect objects in the image. The YOLO model outputs a list of bounding boxes and their associated class probabilities. Each bounding box represents a detected object, and the class probability indicates the likelihood that the object belongs to a particular class.
4. Postprocessing the output: The final step is to postprocess the output from the YOLO model. This involves applying non-maximum suppression to remove duplicate detections and filtering out objects that do not meet a certain confidence threshold

V.ARCHITECTURE DESIGN

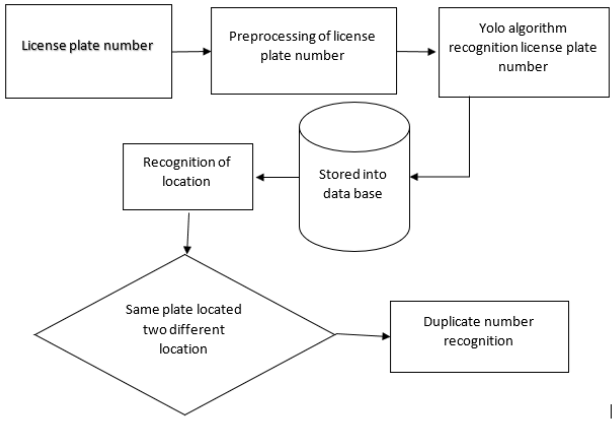


Figure: fake licence plate number

VI.RESULTS AND SNAPSHOTS

Many security systems, including traffic monitoring, parking management, toll collecting, and law enforcement, rely on licence plate identification. Image processing and analysis stages such as detection, segmentation, Normalisation, and recognition are commonly used in the process. During the detection stage, the system uses techniques such as edge detection, template matching, and machine learning-based object detection to try to locate the licence plate region inside the image. After detecting the plate, the system may do some preprocessing procedures, such as denoising, filtering, or morphological operations, to improve the image quality and remove any unwanted parts. During the segmentation stage, the system separates the licence plate characters from the backdrop and other features by employing techniques such as thresholding, edge detection.

6.1 Original Image

6.2 Image after applying bilateral filter

6.3 Canny Edges

V. CONCLUSION

In this study, a camera was used to capture images of vehicle licence plates, which an embedded system subsequently analyzed for character recognition. The segmentation technique is used to divide the characters and numbers into groups.

The characters are recognized using OCR technology, which then transforms them into a car licence plate. All images are sent in real-time to the server via an API connection and are then saved in the database by the server. Moreover, the technology searches in real-time for the sought-after vehicle and alerts the closest police checkpoint to take action and stop it.

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