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Review on Forbidden Car Detection System Based on Image Processing

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Abstract: This study aims to detect vehicles that are parked at no parking area so that it can be used as forbidden parking management and find out the illegally parked vehicle that are parked on roadside. In this study, we are using Image Processing techniques and Machine Learning.

I. INTRODUCTION

India is a country which has a large number of populations of approx. 139.34 crores (2021). Having large number of populations leads to having huge number of vehicles. If there is a vehicle so we have to allot the space for parking the vehicle as there is a chaos of parking at legal parking rediscussing some earlier used system for parking in India as there is large number of workers that are deployed to check the unauthorized parked vehicles. So, to check this system manually is a difficult task for such a huge number. And also, there are some challenges also such as vehicle owners evade the fine by various illegal means like bribing the police officer, threatening them etc. Towing vans need to manually search for illegally parked vehicles for this system it requires large overhead costs in manpower payment, fuel and other physical surveillance. This project is based on Machine Learning and Image Processing Techniques. It detects whether a vehicle is moving or in ideal position when vehicle is detected as ideal then we will check the legal parking area, if the vehicle is not correctly parked then we will use image processing techniques to detect the number plate of a vehicle. So, this is very efficient way to park the vehicle at correct allotted area

Currently, parking at roadside on highway is the given solution provided by the existing system. We are enhancing it by giving the proposal of parking the vehicle inside the white line which is drawn on roadside.

II. RELATED WORK

In recent years, forbidden parking detection with computer vision-based systems that rely on the use of video camera has drawn increasing interest due to its potential to enable a more cost-effective solution. For example, image segmentation and tracking algorithm was proposed using cost function on each frame of video sequence to detect illegally parked vehicles in real time.

However, this approach tends to give false detection results under the influence of varying illuminance intensity because the process of detecting object and tracking vehicle rely on the initial foreground segmentation results.

1) They have done research to automatize the detection of illegally parked vehicles by providing real-time notification regarding the occurrences and locations of illegal parking cases, thereby improving effectiveness of parking rules and regulations enforcement. The iConvPark is implemented on a Raspberry Pi with the use of Convolutional Neural Network as the classifier to identify illegally parked vehicles based on live parking lot image retrieved via an IP camera. The system has been implemented at a university parking lot to detect illegal parking events.

2) The image processing techniques consist of colour conversion, image segmentation using Otsu's thresholding, noise removal, image subtraction, image cropping and bounding box feature. The optical character recognition based on template matching approach is used to analyse the printed characters on the segmented license plate image and to produce an output data consisting of characters. Overall, the proposed automatic vehicle license plate recognition system is capable to perform the recognition process by successfully recognizing license plate of 13 cars, from a total of 14 cars.

3) They have studied to detect vehicles that are on the side of the parking lot so that it can be used as a smart parking system for parking management and find out information on the availability of parking spaces. In this study, the authors used the Haar Cascade Classifier, and YOLOv3 then compared them to get the best accuracy in detecting parked cars. The test was carried out using ten different scenarios, the highest accuracy obtained in this study was 96.88% using YOLOv3 with a probability of 90%. In contrast, the accuracy obtained by using the Haar Cascade Classifier is 63.34%.

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4) In this paper, they have developed a system to leverage traffic surveillance cameras to detect vehicle speed. In this system, we use a detection-based tracking paradigm for multiple object tracking then speed is estimated. First, YOLOv4 with transfer learning is applied for vehicle detection, a comparative analysis is carried out to choose trackers that work well with YOLOv4 in this task.

5) Vehicle number plate recognition plays a significant role in many areas. In this paper, an efficient and an amazingly simple method is used to recognize the number plate. In the proposed method, Open CV library along with python language is used for image processing using py tesseract. The input image is taken and converted into grayscale image and the processed image is filtered through bilateral filter to remove unwanted characters. In this paper, Canny edge detection method is used to detect the edges of license plate. TESSERACT is used as an Optical Character Recognition (OCR).

From some of the studies previously mentioned, no one has made a forbidden car detection system. Roadside parking has many challenges, such as traffic jams, pedestrians walking area and many other things. So that in this study, we will create a forbidden car detection system that can be used to check whether a vehicle is parked correctly or not.

III. PROPOSED SYSTEM

The camera is placed on the side of the road, which is used to capture the video frame by frame so that it can detect whether a vehicle is parked correctly or not.

The illustration of the proposed system can be seen in Fig. 1.

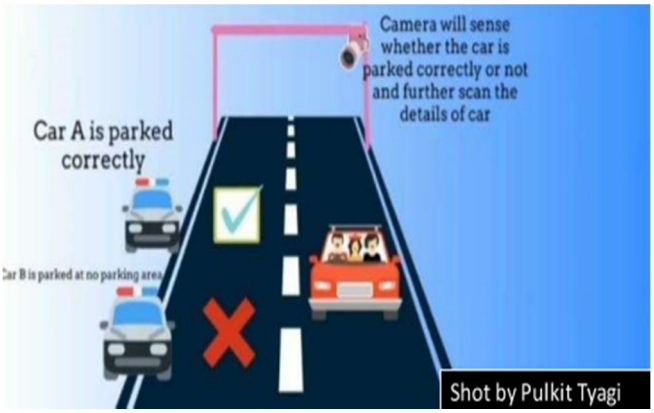


Fig 1. System Illustration

A. Input Data

The input data used in this study is a video or image taken using a CCTV camera installed on a roadside pillar. In this car A is correctly parked whereas car B is not parked correctly.

B. Data Preprocessing

The input data in the form of video is converted into a frame to make it easier to detect whether a vehicle is parked inside the while line on the road using machine learning techniques.

C. Detection of Number Plate of a vehicle using image processing and speed.

In this system we need to detect the number plate of a vehicle so that we can check the details of the vehicle owner. Using Image processing we detect the number plate using python.

D. Detection of vehicle speed

We have to detect whether a vehicle inside the white line is moving or the vehicle is ideal. Moving vehicle at any speed is not considered as parked vehicle at no parking area only the vehicle which has no speed is considered for fine.

IV. EXPECTED RESULTS

Result for a project is the main part. What we have studied, what we have implemented can be verified only by results. Here we are expecting the result as when a vehicle parked outside the white line then we have to capture the number plate of that vehicle whereas if the vehicle is parked inside the white line then it is correctly parked.

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Fig.2 One example of detection that vehicle is parked at forbidden parking area



Fig.3 One example of detection that vehicle is parked correctly.

In Fig 2 we can see that vehicle is not parked inside the white line on the road i.e., vehicle is in ideal position so we have to detect the number plate of this vehicle and check the details of the owner.
In Fig 3 we can see that the vehicle is in ideal position then we checked that vehicle is parked inside the white line i.e., vehicle is correctly parked.


Fig.4.1 Vehicle parked outside the white line



Fig,4.2 Number plate detection of a vehicle

In figure 4.1, there is a vehicle which is parked outside the white line and the vehicle is not moving
In figure 4.2 we have detected the number plate of a vehicle as UP22T2086 So we have send the details of car owner to traffic police so they can take the right action against the vehicle owner.

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V. CONCLUSIONS

By using this system, we are trying to solve the trouble of parking system in India. India has very large population approx. 139.34 crores. Nowadays, a large number of people are using private cars for travel rather than public mode of transport like buses and train. So definitely, there is an issue of parking in India. Parking vehicles at roadside is not the best solution provided earlier. Now, we are proposing the best possible solution for the parking system as everyone have to park their vehicle inside the white line drawn on roadside. Also, we can reduce the man power which is being used previously, we can also reduce the traffic jams and accidents which will occur when someone parked their vehicles at the corner of the road illegally. Corruption which is on its peak can also be cured in this system.

REFERENCES

[1] Ng, C. K., Cheong, S. N., Yap, W. J., & Foo, Y. L. (2018). Outdoor Illegal Parking Detection System Using Convolutional Neural Network on Raspberry Pi. International Journal of Engineering & Technology, 7(3.7), 17-20.

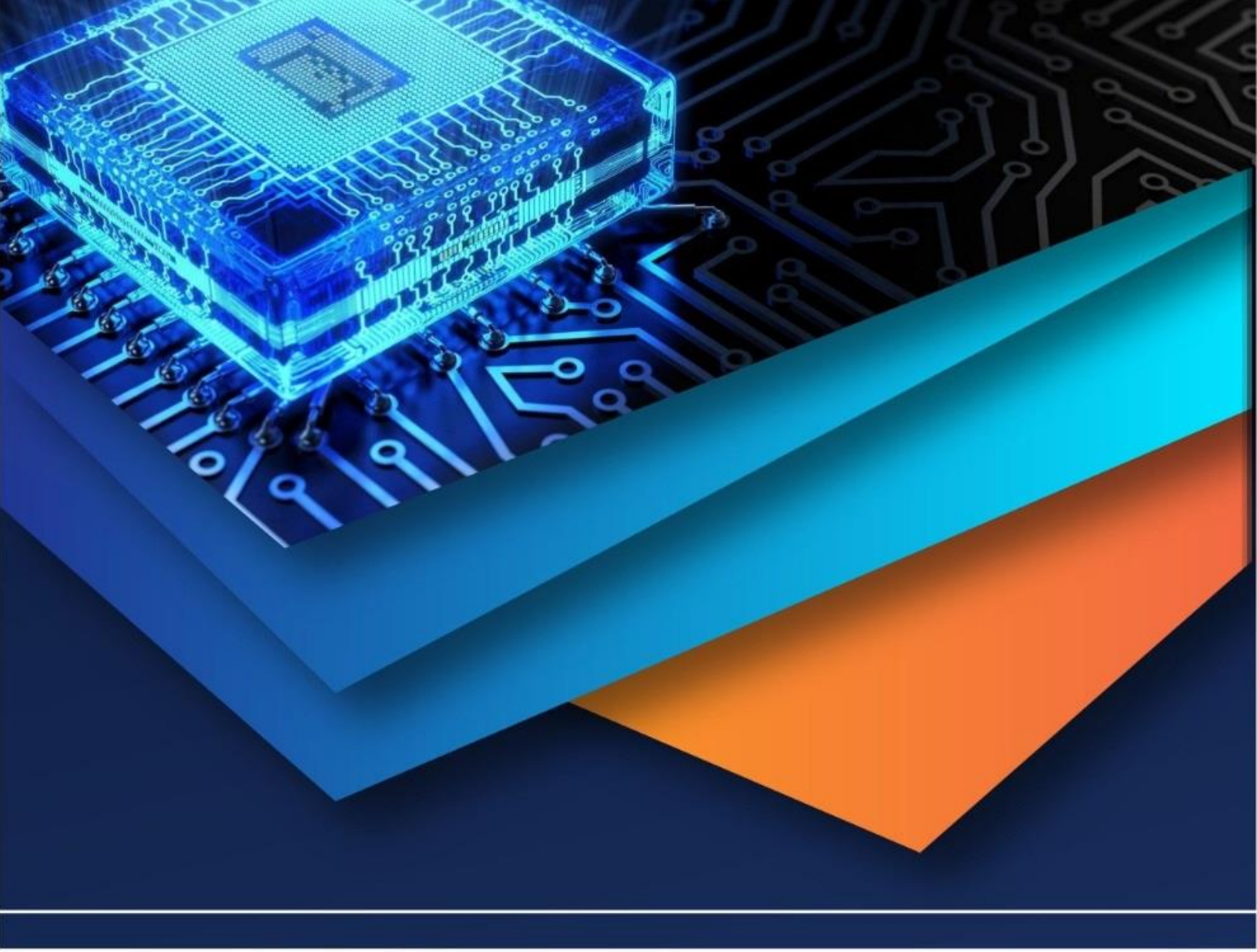
[2] Yogheedha, K., Nasir, A. S. A., Jaafar, H., & Mamduh, S. M. (2018, August). Automatic vehicle license plate recognition system based on image processing and template matching approach. In 2018 international conference on computational approach in smart systems design and applications (ICASSDA) (pp. 1-8). IEEE.

[3] Manase, D. K., Zainuddin, Z., Syarif, S., & Jaya, A. K. (2020, July). Car detection in roadside parking for smart parking system based on image processing. In 2020 International Seminar on Intelligent Technology and Its Applications (ISITIA) (pp. 194-198). IEEE.

[4] Quang, P. H., Thanh, P. P., Van Anh, T. N., Phi, S. V., Le Nhat, B., & Trong, H. N. (2021, November). Vietnamese vehicles speed detection with video-based and deep learning for real-time traffic flow analysis system. In 2021 15th International Conference on Advanced Computing and Applications (ACOMP) (pp. 62-69). IEEE.

[5] Shariff, A. M., Bhatia, R., Kuma, R., & Jha, S. (2021, March). Vehicle number plate detection using python and open cv. In 2021 International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE) (pp. 525-529).IEEE.

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