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Fast Vehicle License Plate Detector using Yolo v4

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ABSTRACT: Data compression techniques permit records size to be reduced previous to data transmission and contain decompression upon switch. This examine shows for the first time that license plate (LP) detection may be performed without complete decompression of the encoded information. Therefore, by way of figuring out in advance which photos are required for LP popularity, computational prices of the system can be decreased. The YOLO V4 Tiny object Detector is used a good way to locate LPs inside the generated photos. English, a public dataset, is used to interpret the Findings in terms of velocity and precision and for comparison with previous studies. Using as a minimum two orders-of-significance less quantity of records, the proposed compressed area LP detector accomplished similar precision and take into account values to those of the ultra-modern LP detection schemes tested on each dataset. Furthermore, the proposed technique effects in extra than 30% saving in inference time. The results suggest that the proposed method may be utilized for rapid video archive searching programs.

KEYWORDS: LP Detection, YOLO V4, Neural Network, ANN,

I. INTRODUCTION

Currently, vehicles have been used widely in every area of production and life of people. With the total number of vehicles increasing quickly, traffic violations will appear more frequently in the public traffic, such as running the red light, over speed. If only the numbered traffic police are relied on to avoid to huge number of traffic violations, the public traffic will sink into paralysed position. The license plate is unique information for every car. And its image is an important resource for accessing its owner and exchanging information. Therefore, images can be used as major media for human/vehicle identification. And the technology of image analysis was involved in all kinds of aspects of human life already. Therefore, automatic collection and management of license plate information from digital image become an effective way to supervise public transportation.

Vehicle License Plate Recognition is an extra critical part of modern intelligent transportation system since the license plate number is a simple and effective way for identifying vehicle. Specifically, there would be no vehicle parking access control and auto payment check in highway without the technique of vehicle license plate recognition. The license plates recognition system has a wide range of applications 1) Highway automated tolling, monitoring management, 2) community automated parking management, 3) the urban road monitoring and illegal-events management, 4) checking vehicles, 5) traffic statistics, and safety management. For instance, the tolling efficiency in traditional manual way on toll highway was low. With the growing traffics in recent years, toll stations have already been a bottleneck to impede the highway to fully display its advantages. Automatic toll collection from the bank's account of vehicle owner without stopping is an effective way to solve this problem.

II. RELATED WORK

One main function of this system is that it will greatly enhance the channel capacity and reduce time through toll stations. Statistics have shown that the average vehicle passing rate is 1500 per hour on highway toll station equipped with automatic toll collection, and the rate is 650 per hour on toll station equipped with automatic coin-operated machine, while the maximum rate is 350 per hour in traditional manual way. LPR usually is used for detection of some special vehicles. This feature is mostly focus on the vehicles listed in the blacklist, such as the vehicle fled after the accident, or reported as stolen. As long as the relevant information of license plate is input into dataset, LPR will automatically lead to find out the vehicle information. Once the vehicle information found, the systems will feedback it to police station. The techniques of the license plate recognition have been developed for many years. With the hardware and software improved, the accuracy of license plate recognition has been improved to some extent. But the

current accuracy still cannot satisfy all the requirements of the traffic department concerned. The license plate extraction is not a simple process, as under some situations, it is easy for people to judge but it will be very hard for computer to do it.

III. METHODOLOGY

ALPR is one of the widely used computer vision applications. It makes use of various methods like object detection, segmentation, etc. For hardware, the ALPR system only requires a camera and a good GPU. To make it simple this blog post will focus on a two-step process.

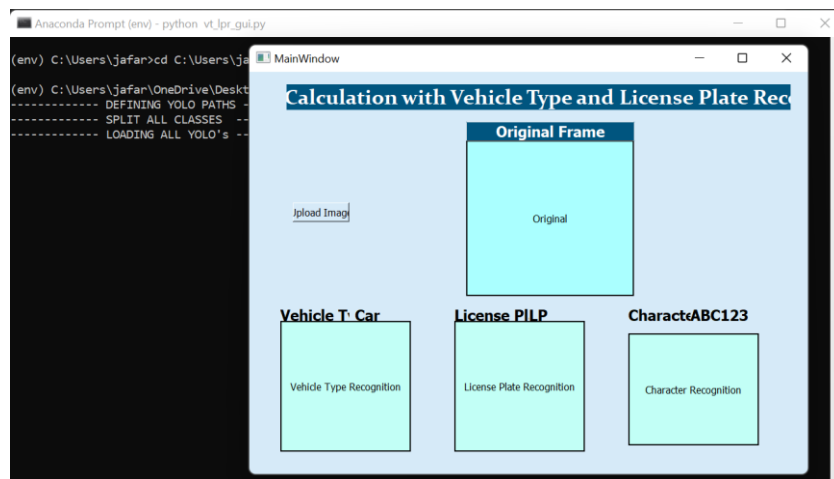
1. Detection: Firstly, an image or a frame of the video sequence is passed to the detection algorithm from a camera or an already stored file, which detects the vehicle, license plate and returns the bounding box location of that plate.

2. Recognition: The YOLO is applied to the detected license plate for recognizing the characters of the plate and returns the characters in the same order in text format. The output can be stored in a database or can be plotted on the image for visualization.

The YOLOV4 architecture consists of various parts, broadly they are - The input which comes first and it is basically what we've as our set of training images which will be fed to the network - they are processed in batches in parallel by the GPU. Next are the Backbone and the Neck which do the feature extraction and aggregation. The Detection Neck and Detection Head together can be called as the Object Detector. And finally, the head does the detection/prediction. Mainly, the Head is responsible for the detection (both localization and classification).

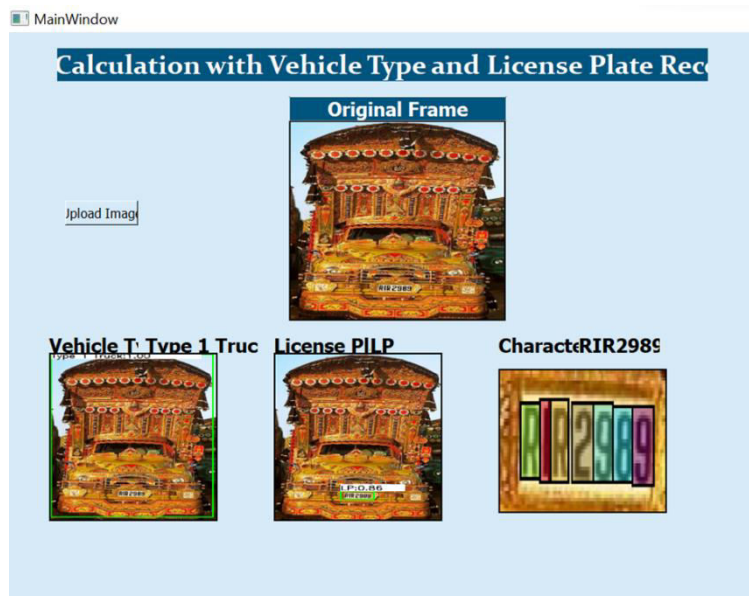
IV. EXPERIMENTAL RESULTS

The figure (a) shows the console that is developed in python for the LP detection platform. Figure (b) and (c) shows the detection output.

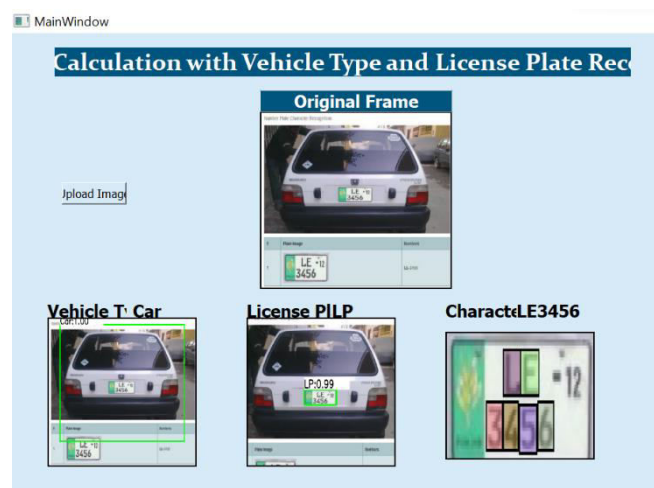


(a)

(c)



(b)



(c)

V. CONCLUSION

This paper describes a study of vehicle number plate identification in traffic surveillance. ALPR is very helpful and reliable for efficient traffic monitoring. Device with powerful image processing technique can easily detect interested vehicles from various angles and view owner information as output. ANPR systems play an important role in the growth of the smart transport network. Recognition may use the image processing technique combined with neural networks to identify the number plates where the angled or side view images, moving distance images, numbering scheme, and number plate type (background) can be further improved. Detection of objects and neural networks is useful for detecting side views or tilted images and moving images from distance. For potential recognition systems,



the choice is to use high-resolution cameras with an increased number of frames for good accuracies and improved accuracy for recognition in future.

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