

Abstract

License plate recognition is crucial for intelligent transportation and improving traffic capacity in cities. However, environmental factors and security issues pose challenges for the system. Poor image quality due to skewed angles, uneven lighting, occlusion, and blurring is common. To address these issues, this paper proposes a new approach for real-time recognition and high efficiency in dealing with blurred images.

Introduction

Computer image recognition technology is also developing, which promotes the research of motorcycle license plate recognition. The research of motorcycle license plate recognition system is based on the rapid increase in the number of motorcycles and the frequent traffic accidents caused by them. Motorcycle license plate recognition technology can be used in road traffic flow monitoring, traffic accident site investigation; Traffic violation automatic record, highway automatic toll collection system, parking lot safety management, intelligent parking lot management and other fields [1].

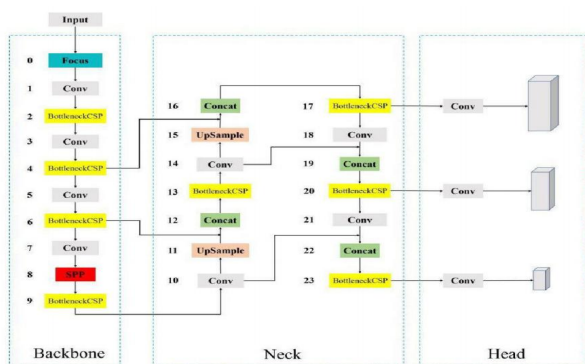


Figure 1: Original YOLOv5s network structure [2]

Method

Yolov5 is in the form of Mosaic data enhancement, which is better suited for detecting small targets. More noteworthy is its adaptive image scaling function, so the box function in the data set [2].py is modified in its code to add the smallest black edge to the original image adaptively, reduce the black edge at both ends of the image height, reduce the calculation amount during inference, that is, improve the speed of target detection.

GUI

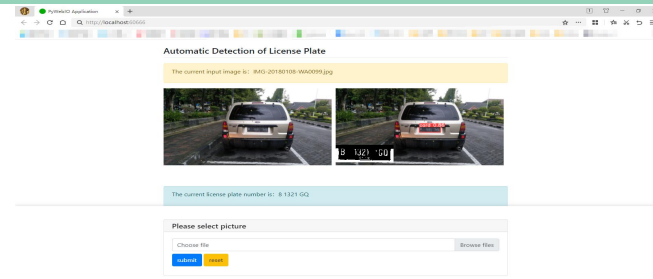


Figure 2: The page of the GUI

The GUI of the project is implemented in html, firstly at the bottom of the page, browse for the license plate image to be recognised and submit it, then on the left side of the page the loaded image will be displayed, on the right side of the page the success rate of the recognised image will be shown and the greyed out number plate will be displayed. The final result is displayed at the bottom of the image.

Result

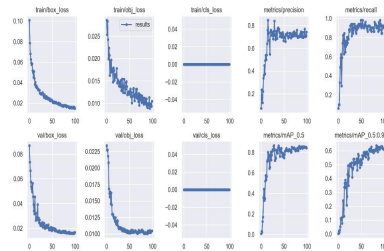


Figure 3: Parametric results of the model



Figure 4: Identification results of the model

The YoloV5 model recognizes the location so that we can correctly capture the location of the license plate. We will then grayscale the image using the cv function to make it easier to separate the characters in the image. Next, we'll use OCR for text recognition and compare it to real tags.

Conclusion

The project aimed to optimize a recognizer for detecting small-scale objects by investigating the effects and logic between different structures and techniques. The study used three datasets of varying complexity and found promising results. The findings suggest significant performance improvements while maintaining real-time reasoning time.

References

- [1] Hsi-Jian Lee, Si-Yuan Chen and Shen-Zheng Wang, "Extraction and recognition of license plates of motorcycles and vehicles on highways," Proceedings of the 17th International Conference on Pattern Recognition, 2004. ICPR 2004., 2004, pp. 356-359 Vol.4.
- [2] L. Xiaomeng, F. Jun and C. Peng, "Vehicle Detection in Traffic Monitoring Scenes Based on Improved YOLOV5s," 2022 International Conference on Computer Engineering and Artificial Intelligence (ICCEAI), 2022, pp. 467-471.