Convolutional neural network-based detection of car license plate

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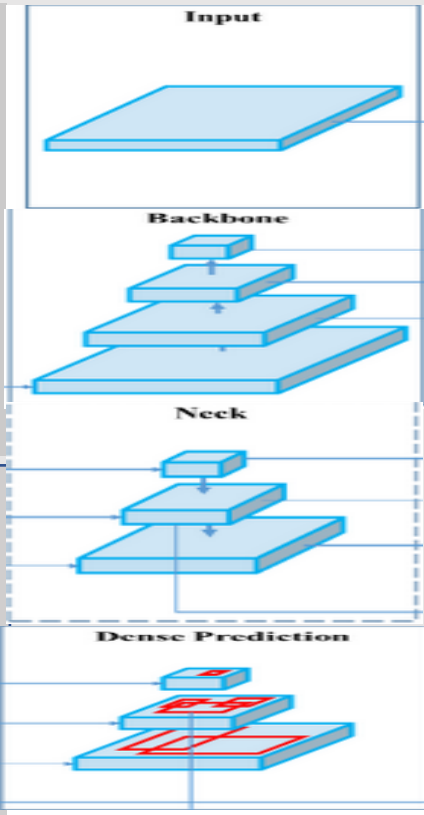
Abstract

As China's economy continues to rapidly develop, the number of vehicles on the road has increased, leading to a growing need for improved traffic management and safety standards. In urban video surveillance, vehicle identification, and license plate recognition in parking lots ,with the increasing popularity of new energy vehicles, license plate recognition poses additional challenges due to differences in color and structure compared to traditional license plates. This has led to difficulty in recognizing license plates using older systems available on the market. To address this problem



Introduction

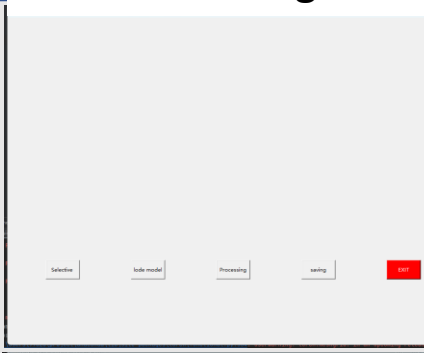
In recent years, the use of Convolutional Neural Networks (CNNs) for car license plate detection has shown significant improvement. Unlike traditional methods that require complex feature extraction, CNNs can effectively learn features from a large number of samples by using the original image as input. This makes it an ideal solution for improving license plate recognition systems.

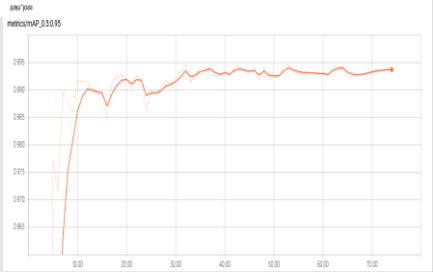
Hardware	(CPU): i5-11260H CPU@ 2.6GHz (GPU): NVIDIA GeForce GTX 3060
Sofewar e	IDE: Pycharm Language: python

Methodology

First,the dataset was collected and preprocessed, Next, the YOLOv5 model architecture was selected and adapted to the license plate recognition task. The modified YOLOv5 model was trained using the preprocessed dataset. fter training, the model was evaluated on a test set to measure its accuracy and performance. Finally, the trained model was deployed for real-world use

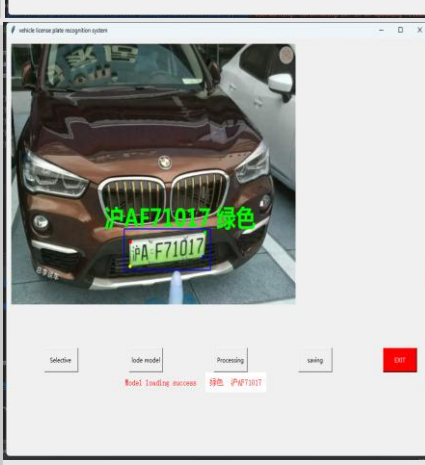
Interface Design





Result and Discussion

the proposed YOLOv5-based license plate recognition system shows promise for real-time and accurate license plate recognition. The system's ability to detect and recognize both single-layer and double-layer license plates is a significant advantage, and its high efficiency makes it suitable for deployment in various scenarios. However, there is still room for improvement, particularly in increasing the size and diversity of the dataset used for training and addressing the limitations of the pre-processing techniques used



1. References

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