Abstract

In recent years, neural networks have demonstrated significant potential in computer vision tasks, including object detection, text recognition, and data extraction from complex layouts. One of the challenging tasks in this domain is the automated recognition of traffic signs, which proved to be essential on many fields. One such field is the development of self driving cars which could be essential in saving lives and providing a safer method of transfer in the long run. Of course to achieve this we have to develop stable, reliable vision systems which are capable of recognizing the traffic scenario.

A key component in intelligent speed assistance systems is the development of reliable speed sign recognition, which is already an essential feature in modern vehicles. By notifying drivers when speed limits are exceeded, such systems enhance road safety. The development of a robust sign recognition system involves tackling issues such as diverse sign structures, variable font sizes, and non-standard layouts. Traditional methods rely heavily on rule-based approaches, which often struggle with flexibility and scalability. Neural networks, particularly deep learning models, have shown promise due to their adaptability and capability to learn directly from data. However, achieving high accuracy in sign recognition also requires addressing significant data handling, computational and training challenges.

This paper explores the development and evaluation of a neural speed sign recognition system aimed at optimizing recognition accuracy and robustness. The core objective is to design an architecture that has decent recognition accuracy, and to perform a comprehensive evaluation to assess the system's performance on a real world dataset. The paper integrates pre-processing techniques for specific types of data, details of neural network training, and a post-processing tracking method that can improve detection performance. This tracking approach allows the model to achieve relatively strong results even without requiring perfect training accuracy.