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With Deep Reverence.

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ABSTRACT

Traffic Sign Recognition plays a crucial role in management of the traffic-sign inventory. It provides an accurate and timely way to manage traffic-sign inventory with a minimal human effort. In the computer vision community, the recognition and detection of traffic signs are a well-researched problem. A vast majority of existing approaches perform well on traffic signs needed for advanced driver-assistance and autonomous systems. However, this represents a relatively small number of all traffic signs (43 categories) and performance on the remaining set of traffic signs, which are required to eliminate the manual labor in traffic-sign inventory management, remains an open question. In this project, we address the issue of detecting and recognizing a large number of traffic-sign categories suitable for traffic-sign inventory management. We adopt a convolutional neural network (CNN) approach. We propose several improvements that are evaluated on the detection of traffic signs and result in an improved overall performance. The results are reported on highly challenging traffic-sign categories that have not yet been considered in previous works. We provide comprehensive analysis of the deep learning method for the detection of traffic signs with a large intra-category appearance variation and show below 3% error rates with the proposed approach, which is sufficient for deployment in practical applications of the traffic-sign inventory management.

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