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Intelligent Transport System: Classification of Traffic Signs Using Deep Neural Networks in Real Time

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Abstract : Traffic control has been one of the most common and irritating problems since the time automobiles have hit the roads. Problems like traffic congestion have led to a significant time burden around the world and one significant solution to these problems can be the proper implementation of the Intelligent Transport System (ITS). It involves the integration of various tools like smart sensors, artificial intelligence, position technologies and mobile data services to manage traffic flow, reduce congestion and enhance driver's ability to avoid accidents during adverse weather. Road and traffic signs’ recognition is an emerging field of research in ITS. Classification problem of traffic signs needs to be solved as it is a major step in our journey towards building semi-autonomous/autonomous driving systems. The purpose of this work focuses on implementing an approach to solve the problem of traffic sign classification by developing a Convolutional Neural Network (CNN) classifier using the GTSRB (German Traffic Sign Recognition Benchmark) dataset. Rather than using hand-crafted features, our model addresses the concern of exploding huge parameters and data method augmentations. Our model achieved an accuracy of around 97.6% which is comparable to various state-of-the-art architectures.

Keywords : multiclass classification, convolution neural network, OpenCV
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