

Traffic Sign Detection System Using Convolutional Neural Network

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Abstract

Traffic sign recognition is a fundamental aspect of intelligent transportation systems, playing a significant role in improving road safety and traffic efficiency. The work presented in the paper aims to build a robust Convolutional Neural Network (CNN) model using TensorFlow, a widely adopted deep learning framework, to effectively classify various traffic signs from image data. The model is trained on a comprehensive dataset containing diverse traffic sign images, employing advanced computer vision and deep learning techniques to extract intricate visual patterns and features. The proposed CNN architecture is carefully designed to capture both spatial and hierarchical information, enhancing the model's ability to distinguish between different types of traffic signs such as regulatory, warning, and informational categories. To evaluate the model's effectiveness, performance metrics like classification accuracy and computational efficiency are employed, ensuring its feasibility for real-world applications. By incorporating the developed model into intelligent transportation systems, vehicle safety technologies, or autonomous driving platforms, this solution holds promise for improving road safety, enhancing traffic flow, and aiding in better decision-making for drivers and automated systems alike. The work not only demonstrates the power of deep learning in addressing real-world transportation challenges but also provides valuable insights into the practical application of machine learning for computer vision tasks. This research contributes to the advancement of intelligent transportation solutions and encourages further exploration in this rapidly evolving field.

Keyword

Traffic sign recognition, Convolutional Neural Networks (CNN), TensorFlow, Computer vision, Deep learning, Image classification, Smart transportation.