IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 2, March 2025

Traffic Sign Based Recognition in Regulations and Foggy Weather using RCNN

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Abstract: *This study presents a robust traffic sign recognition system designed to operate effectively under challenging conditions, particularly in foggy weather. Utilizing a Region-based Convolutional Neural Network (RCNN), the proposed model enhances detection accuracy by focusing on relevant image regions while reducing computational overhead. Advanced image preprocessing techniques, including contrast enhancement and noise reduction, improve visibility in low-contrast environments. Additionally, data augmentation with fog simulation ensures the model generalizes well across varying weather conditions. Experimental results demonstrate superior detection rates and reduced false positives compared to conventional methods. This research contributes to safer autonomous driving and advanced driver-assistance systems by ensuring reliable traffic sign recognition in adverse conditions.*

Keywords: Traffic sign recognition, RCNN, foggy weather, image preprocessing, autonomous driving