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

Smart Traffic Monitoring and Automated Penalty Collection System

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Abstract: *Rising road accidents due to helmetless riding and triple riding pose a significant threat to public safety. Traditional manual enforcement is inefficient, error-prone, and resource-intensive. This paper proposes an AI-based system using Convolutional Neural Networks (CNN) and Optical Character Recognition (OCR) to automatically detect helmetless riders and triple riding violations in real time. The system integrates image processing, object detection, and automated fine collection, improving road safety and ensuring compliance with traffic regulations. Our experimental results demonstrate high detection accuracy, scalability, and efficiency, making it an effective solution for modern traffic enforcement.*

Keywords: Helmet detection, triple riding, YOLO, CNN, OCR, traffic rule violation, fine automation