

Abstract 71 – Paper ID: 023**Detection of Blind Spot in Heavy vehicles: A multi Criteria Decision making Approach using Machine learning**

Prajakta R. Singam Kuchewar¹, Uma Patel Thakur²

¹Department of Computer Science & Engineering, Jhulelal Institute of Technology Nagpur, India

²Department of Computer Science & Engineering, Jhulelal Institute of Technology Nagpur, India

Email: prajakta.singam@gmail.com

Abstract

Heavy vehicle blind spot identification is an important issue for IVS since, because to their size, these vehicles provide extensive areas of reduced sight for drivers, which increases the likelihood of accidents and deaths on the road. Although they do their job, traditional sensor-based approaches have problems with cost, flexibility, and integrating with changing driving conditions. To improve the accuracy of blind spot identification and decision assistance for drivers, this study suggests a multi-criteria decision-making (MCDM) strategy that incorporates machine learning. A powerful collection of features is constructed by merging data from several sources, such as LiDAR, radar, ultrasonic sensors, and vision systems based on cameras. The use of machine learning techniques like Support Vector Machines (SVM), Random Forest (RF), and Deep Neural Networks (DNN) allows for the real-time classification and prediction of probable blind spot items. With the help of the MCDM framework, we may optimize the decision-making process for alert generation by prioritizing variables including computing efficiency, environmental adaptability, reaction speed, and detection accuracy. Comparing the suggested method to traditional single-sensor or single-algorithm systems, experimental findings on real-world datasets of heavy vehicles show that it produces better performance. Not only does the framework make roads safer by decreasing accidents caused by blind spots, but it also offers a scalable solution for autonomous car and next-gen driver support systems.

Keywords: Blind Spot Detection, Heavy Vehicles, Multi-Criteria Decision-Making (MCDM), Machine Learning, Sensor Fusion, Intelligent Transportation Systems (ITS), Driver Assistance Systems, Deep Learning, Road Safety, Real-Time Object Detection