

Urban Traffic Safety: A Review of Data Sources and Machine Learning Models for Vehicle Accident Risk Assessment

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Abstract: *Traffic roads in urban areas have become a major issue as the rates of accidents involving vehicles increase in such high-population cities. This survey provides an informative overview of machine learning (ML) models and databases employed in vehicle accident risk evaluation. Classical and new data inputs can include sensor data, GPS, surveillance, crowd-sourced information which is divided into conventional and new data as well as assessed on how they can relate to risk modelling. The article discusses a wide range of ML techniques in the following way: decision trees, SVMs, ensemble methods, and deep learning models, such as graph neural networks (GNNs). Practical developments of smart cities and intelligent transport systems (ITS) are discussed, with the focus on cloud computing analytics and predictive safety models. Such issues as data integration, interpretability of the models, the ability to make predictions in real-time, and the desire to improve the standardization were mentioned as key challenges. The proposed review is expected to advise further researchers and urban planners on developing scalable, accurate, and transparent smart transportation ecosystem risk assessment systems.*

Keywords: Road Safety, Vehicle Accident Risk Assessment, Traffic Data Sources, Machine Learning Models, Smart Cities, Real-Time Prediction

