Collaborative Sciences Center for ROAD SAFETY

RESEARCH BRIEF

Safety Enhancement by Detecting Driver Impairment Through Analysis of Real-Time Volatilities

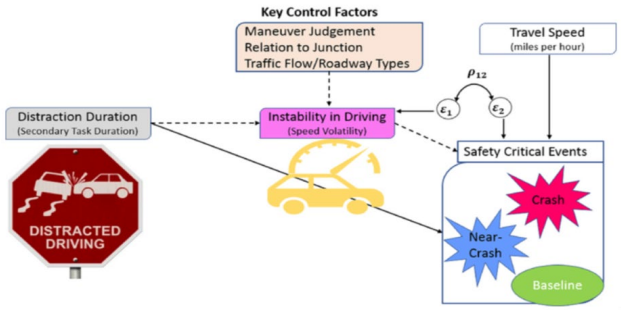
Distracted driving can lead to driving instability and result in crashes causing injuries and the loss of valuable lives. Early detection of driver distraction is critical to alert drivers by providing feedback and warning messages.

This project develops a framework to detect driver impairment using extensive real-time driver biometric information and data related to vehicle kinematics and the roadway environment. Data from multiple sources, including driver gaze data, vehicle kinematics indicators, and external factors like interaction with surrounding traffic, are collected and analyzed.

The study detects deviations from regular driving events and links them with safety-critical events. The project sheds light on the association of the duration of distracted driving, driving errors, and violations with safety-critical events.

The study explores how inference-based statistical models and machine learning algorithms can enhance emerging driver assistance systems in automated vehicles, focusing on distracted driving. The project findings can improve traffic safety by developing more intelligent and forgiving vehicle automation features.

Results indicate that drivers in crashes and near-crashes were distracted for longer than baselines. Similarly, drivers in safety-critical events had higher instability in driving compared to baseline drivers.



Conceptual framework of the study

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