

Driver Stability Detection Before Vehicle Starts

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Abstract: Road accidents caused by impaired driving conditions such as drowsiness, fatigue, stress, and alcohol consumption remain a major challenge in modern transportation systems. Most existing driver monitoring solutions detect abnormalities only after the vehicle has already started, resulting in delayed preventive action. To address this issue, this research proposes a Driver Stability Detection System Before Vehicle Start that evaluates the driver's physical and mental condition prior to ignition.

The proposed system integrates computer vision and sensor-based technologies to monitor critical driver parameters such as eye movement, facial expressions, alcohol level, heart rate, and posture. A camera module is used to detect fatigue and emotional instability through image processing techniques, while the MQ-3 alcohol sensor measures breath alcohol concentration. Additionally, physiological and behavioral data are analyzed using machine learning algorithms to determine the driver's fitness to operate the vehicle.

Based on the computed Driver Fitness Score, the system either permits or restricts vehicle ignition. In case of unstable conditions, alerts and real-time location details are sent using GSM and GPS modules. This proactive approach ensures that only physically and mentally fit individuals are allowed to drive, thereby reducing accident risks and enhancing road safety through a reliable pre-driving safety mechanism.

Keywords: Driver Stability Detection, Pre-Ignition Safety System, Drowsiness Detection, Alcohol Detection, Computer Vision, Machine Learning, Driver Monitoring System(DMS)

