

An Integrated Solution for Managing Intoxicated and Drowsy Drivers: A Vehicle Safety System

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Traffic accidents caused by driving under the influence of alcohol and drowsiness have become pressing issues in our country. This abstract presents an innovative solution that addresses these concerns by utilizing advanced monitoring and control technologies to mitigate the risks associated with intoxicated and sleepy drivers. The proposed system integrates an Arduino Uno microcontroller with an OV7670 camera module to provide real-time monitoring of driver behaviour. A camera sensor is strategically positioned on the front windshield to continuously observe the driver's eye blinking patterns, while an MQ3 alcohol sensor is securely mounted on the steering wheel to detect alcohol levels from the driver's breath. The novelty of this work lies in the integration of real-time monitoring of both alcohol levels and driver behaviour. Upon starting the vehicle, the system swiftly measures the driver's breath for signs of intoxication using the alcohol sensor. If an unsafe alcohol concentration is detected, the system automatically disables the ignition, preventing the driver from operating the vehicle. Simultaneously, the camera continuously analyses the driver's eye blink rate, identifying prolonged eye closures indicative of drowsiness. In such instances, the system takes control of the vehicle, initiating a visual and audible warning to alert the driver and prevent potential accidents. In the event of a driver blinking their eyes while driving, the system promptly responds by decelerating the vehicle, bringing it to a controlled stop, and sounding an alarm to capture the driver's attention. The alcohol sensor remains active during driving, automatically reducing speed, bringing the vehicle to a complete stop, and activating an alarm upon detecting alcohol consumption. By integrating these monitoring and control mechanisms, the solution aims to significantly reduce accidents caused by alcohol impairment and drowsiness, representing a promising step towards safer roadways, while reducing reliance on manual enforcement.

Keywords: Alcohol sensor, Arduino Uno, Eye blinking detection, Monitoring system, Traffic accidents