Anti Sleep Alarm with Driver Safety Using Arduino

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Abstract: *Driver fatigue and alcohol consumption are two of the leading causes of road accidents worldwide. To address these critical safety challenges, the proposed system integrates Anti-Sleep Alarm Detection and Alcohol Detection into a single intelligent safety solution. The system utilizes low-cost sensors and microcontroller-based technology to continuously monitor the driver's physical condition and sobriety level in real time.*

The Anti-Sleep Alarm Detector employs eye-blink sensing or drowsiness detection through infrared (IR) sensors or an eye-blink monitoring module. When the system detects prolonged eye closure, reduced blinking rate, or signs of fatigue, it immediately triggers a loud buzzer or vibration alert to awaken the driver and prevent potential accidents. This proactive mechanism helps mitigate the risk of fatigue-induced loss of control.

The Alcohol Detector uses an MQ-3/MQ-135 gas sensor to measure the alcohol concentration in the driver's breath. If the detected level exceeds the predefined safety threshold, the system activates an alarm and can additionally be configured to disable the vehicle's ignition system. This ensures that the vehicle does not operate under intoxicated conditions, thereby preventing drunk-driving incidents.

The combined system integrates both modules with a microcontroller such as Arduino or ESP32, enabling data processing, threshold comparison, and alert generation. Optional features such as LCD display, GSM alert, IoT connectivity, or vehicle immobilization can enhance the system's reliability and usability.

By providing real-time monitoring, quick response alerts, and safety-critical intervention, this project aims to significantly reduce road accidents caused by driver drowsiness and alcohol consumption. The solution is cost-effective, easy to implement, and suitable for integration into commercial vehicles, personal cars, and transportation fleets, contributing to safer road environments.

Keywords: *Alcohol Detector*