 

**CHITKARA UNIVERSITY INSTITUTE OF ENGINEERING & TECHNOLOGY, PUNJAB**

**DEPARTMENT OF INTERDISCIPLINARY COURSES IN ENGINEERING**

**Embedded Systems and Internet of Things Laboratory**

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Class Group Section Project Group

**Project Abstract**

**Project Title: *Title of Project***

**Abstract: This is an IoT-based smart vehicle safety project designed to prevent accidents resulting from drunk or drowsy driving. This system incorporates two features: alcohol detection and sleep detection. The alcohol detection module employs a breath sensor, which analyzes the driver's breath to find the alcohol content. If alcohol is detected, then the ignition of the car will be prevented, and an alert notification will be sent to the driver's family using a connected communication platform. The sleep detection module can use a monitoring system in real time like a camera or infrared sensor in detecting the onset of driver drowsiness, characterized by protracted eye closure or head tilt. If sleepiness is detected, the system emits a loud siren to warn the driver and passengers present in the vicinity. In combination, the safety features are designed to help avoid road accidents and protect the driver, passengers, and other road users.**

**Application Area:**

1. **Road Safety Enhancement**: Prevents accidents caused by drunk or drowsy driving, ensuring safer roads.
2. **Personal Vehicle Safety**: Protects individual drivers and passengers by disabling the car's ignition if alcohol is detected.
3. **Public Transport Systems**: Ensures safety in buses, taxis, and other public vehicles by monitoring drivers for alcohol or fatigue.
4. **Commercial Fleet Management**: Provides safety measures for logistics and transport companies to prevent accidents caused by driver negligence.
5. **Family Protection**: Alerts family members in real-time about potential risks, offering peace of mind and proactive safety measures.
6. **Driver Monitoring Systems**: Useful in advanced driver assistance systems (ADAS) for integration into modern vehicles.
7. **Insurance Industry**: Reduces liability and risks, benefiting insurance companies by encouraging safe driving practices.
8. **Smart City Infrastructure**: Integrates with IoT-based traffic and safety management systems to improve urban transportation safety.
9. **Law Enforcement Support**: Aids in enforcing laws against drunk driving and ensures compliance with traffic safety regulations.
10. **Educational and Training Institutions**: Can be used in driving schools to train drivers about the importance of sober and alert driving.

**Impact on Society/Industry:**

**Reduces Road Accidents:** It reduces the count of accidents caused by drunk or sleepy driving, saving lives and reducing injuries.

**Improved Public Safety:** It ensures safer roads for the driver and passengers while protecting pedestrians and other road users.

**Family Security:** It gives a peaceful mind to families as in case of risky driving behavior real-time alerts are sent.

**Expenses Saved:** It reduces expenditure related to damages caused by accidents, medical costs, and vehicle repairs.

**Improved Compliance:** It promotes compliance with traffic safety laws and regulations, thus reducing violations and penalties.

### **Sustainable Development Goals:**

1. **SDG 3 - Good Health and Well-being**
2. **SDG 9 - Industry, Innovation and Infrastructure**
3. **SDG 11 - Sustainable Cities and Communities**
4. **SDG 12 - Responsible Consumption and Production**
5. **SDG 13 - Climate Action**
6. **SDG 16 - Peace, Justice and Strong Institutions**

**Technology Stack-** ESP32, MQ-135, Camera Module, Buzzer/Siren, GSM800, Arduino IDE, OpenCV/Dlib

**Group Details:**

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| **S Sr. No** | **Nam Name of Students** | **Roll No** | **Project Guide Name and Signature** |
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**Approved By:**

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| --- | --- | --- |
| **Name of Faculty in Panel** | **Designation** | **Signature** |
| **(Lab Internal Faculty Name)** | **Designation of Lab Internal Faculty** |  |
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**Final Approved by**

**Dr. Rajneesh Talwar**

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