**SAFE DIVE HACK 2025 TEAM DETAILS FORM**

**1.Team Name:** FocusdriveX

**2.Module Chosen:**    Driver Distraction Alert

**3. Team Members**

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**4. Approach to Solution**

We are developing a smart, multi-stage Driver Distraction Alert system that detects signs of drowsiness or distraction in real time and responds in a way that is effective for the driver while remaining friendly and non-disruptive for passengers.

Using Python 3.11.9 and the recommended ADAS tech stack, our system performs facial analysis through MediaPipe to detect eye closure, yawning, and head pose variation. The detection logic is enhanced using OpenCV for frame processing, SciPy for landmark ratio calculations (such as Eye Aspect Ratio), and Pandas for event logging and analytics.

To minimize false positives, the system uses temporal smoothing and multi-cue detection logic (e.g., eyes closed + head nod). Once distraction or drowsiness is confidently detected, the alert system is activated in three escalating stages:

1. Airflow + Mist Spray: A small fan combined with a refreshing mist is activated near the driver's face to gently stimulate alertness without sound.
2. Seat Vibration: If the driver does not respond, a vibration motor in the seat triggers a physical alert.
3. Sound Alert: As a final step, a directional speaker near the driver plays a sharp audio alert. If the situation remains uncorrected, an emergency bus-wide alarm may be activated.

**5. Hardware Requirements (if needed)**

* Laptop with webcam (min i3 processor, 4GB RAM)
* USB-powered fan with mist spray attachment *(simulation: LED in hackathon)*
* Seat vibration motor *(simulation: console output or buzzer in hackathon)*
* Directional or regular speaker *(simulation: audio file playback)*

**6. GitHub Repository Link:** https://github.com/ahalyaranigowra-wq/focusdrivex