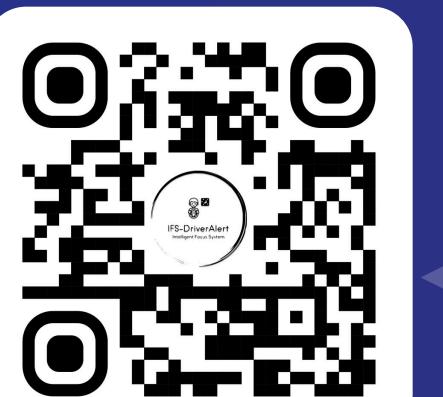




# IFS DriverAlert

## Intelligent Focus System



IFS DriverAlert User Manual

<https://ifsdriveralert.aljoudi.ca>

### Overview

#### What Is It About?

- We are building a driver detection system to monitor signs of drowsiness and play alerts to help prevent accidents

#### Why The System Matters?

- The Canadian Automobile Association (CAA) reports that drowsy driving is as dangerous as impaired driving
- Although drowsiness detection systems are available in high-end vehicles, not everyone can afford those premium options. Our IFS DriverAlert offers low-cost alternative that brings this life-saving technology to all drivers

#### How We Solved The Problem?

- The system uses a camera and MediaPipe, deployed on a Raspberry Pi 5, to detect signs of driver fatigue in real-time

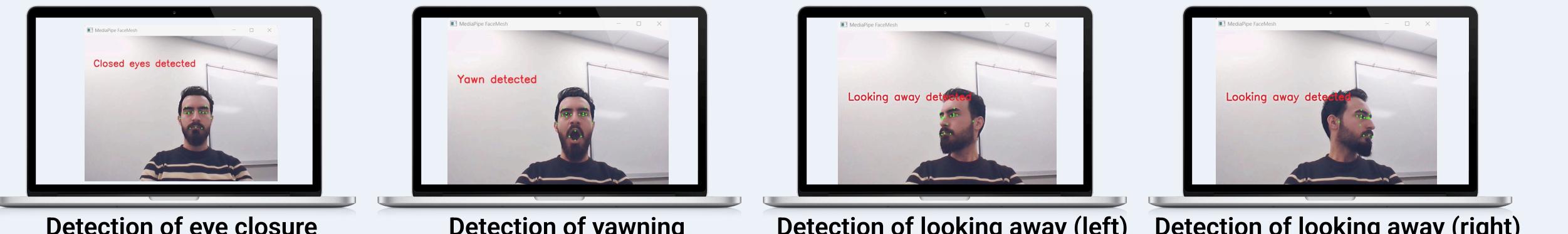
### Methods

- Utilized a Raspberry Pi 5 as the core processing unit
- Applied MediaPipe to detect facial features such as eyes closure, mouth movement and head orientation
- Integrated a NEO-6M GPS module to track vehicle speed and enable automatic control
- Developed and implemented a progressive alert system

### Objectives

- To detect early signs of driver drowsiness using facial monitoring
- To alert the driver in real time through progressive audio warnings
- To create an affordable, easy-to-install solution for any vehicle

### Key Functions



#### 1. Detects Signs Of Driver Drowsiness

- Uses facial monitoring to detect **eye closure**, **yawning**, and **looking away**
- Targets three common indicators of fatigue or distraction

#### 2. Progressive Alert System

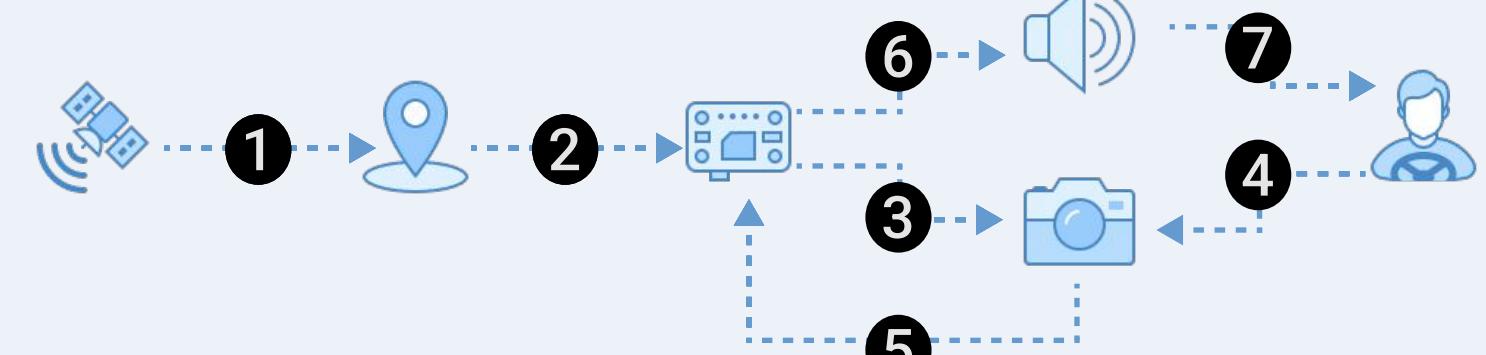
- Delivers escalating audio alerts with **varied messages and volume levels**, based on the frequency of detected signs
- Keeps drivers engaged and aware without being overwhelming

#### 3. Affordable And Easy-To-Install

- Runs offline using a Raspberry Pi, camera and speaker
- A low-cost, plug-and-play solution compatible with any vehicle, without relying on high-end car systems

### Workflow Example - Automode

In Auto mode, the system activates when the vehicle's speed exceeds 19km/h



- NEO-6M GPS module reads real-time speed data from GPS satellites
- GPS data is sent to the Raspberry Pi with the current vehicle speed
- Raspberry Pi runs/stops the detection system based on the speed
- Camera captures the driver's face in real-time\*
- Frames are sent to the Raspberry Pi for processing and analyzing
- If drowsiness is detected, an alert is triggered
- Speaker plays audio alert to warn the driver

\* Privacy Note: images are not stored/transferred, only analyzed in real time

### Results

- The system successfully detects fatigue signs
- The progressive alert system worked as expected
- The system proved to be accurate, responsive and ready for real-world use in any vehicle

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