University of Regina | FACULTY OF ENGINEERING & APPLIED SCIENCE

BUSINESS CASE	
Proposed Project	**IFS DriverAlert**
Executive Summary	The IFS DriverAlert system aims to reduce accidents caused by drowsy driving by providing drivers with an affordable, standalone device that monitors eye closures and sounds an alert when drowsiness is detected. Utilizing a Raspberry Pi 5, a camera, and a buzzer/speaker, the system will leverage a Convolutional Neural Network (CNN) for real-time eye closure detection, offering a practical and cost-effective alternative to drowsiness detection solutions.
Problem Statement	Drowsy driving is a serious risk, contributing significantly to vehicle accidents, injuries, and fatalities each year. Current drowsiness detection systems are often available only in premium vehicles, making them inaccessible to everyday drivers who could benefit from added safety measures to reduce the likelihood of accidents due to driver fatigue.
Proposed Solution	The proposed IFS DriverAlert system is a low-cost, offline device that detects eye closures in real-time without requiring internet connectivity. Using a machine learning model trained on the MRL Eye Dataset, combined with OpenCV for image processing and a Raspberry Pi setup, this standalone solution offers drivers an accessible, easy-to-install safety enhancement that is designed to prevent accidents related to drowsiness in any vehicle.
Cost Analysis	Hardware Costs: ● Raspberry Pi 5, Camera, Speaker, and Accessories: $264.00 Software Costs: ● Open-source libraries like OpenCV and TensorFlow Lite will be used at no cost.
Benefits and Return on Investment	● Enhances road safety by reducing drowsy driving accidents. ● Offers an affordable, accessible alternative to high-end systems. ● Lowers accident-related costs, benefiting drivers and insurers. ● Minimal development costs enable faster potential returns. ● Commercialization potential through sales and partnerships for positive ROI.
Risks and Mitigation	● Team Availability: If a member becomes unavailable (e.g., illness), our team's shared skills allow seamless task reassignment to maintain progress. ● Hardware Issues: In case of equipment malfunction, many other devices and emulation tools available in the market can perform similar tasks, that helps us continue development without delay. ● Model Performance Limitations: If model accuracy is insufficient, we can iterate on dataset quality or model architecture to enhance detection.
Implementa-tion Plan	● Oct.-Nov.: Data collection and training the eye closure detection model. ● Dec.: Hardware integration and system setup on Raspberry Pi. ● Jan.: Testing and refinement in various conditions. ● Feb.-Mar.: Final testing, user feedback, and deployment preparation.