CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY

DEVANG PATEL INSTITUTE OF ADVANCE TECHNOLOGY AND RESEARCH

WEEKLY REPORT

Project ID: 19	Semester: 6
From Date: 15/12/25	To Date: 19/12/25
Student ID: 23DCE091, 23DCE092, 23DCE093	

Work done in last week (Attach supporting Documents):

- Finalized the project title after team discussion
- Defined the initial project scope and objectives
- Finalized focus areas:
  - Real-time visual monitoring
  - Eye blink and drowsiness detection
  - Head pose–based distraction detection
- Explored existing research papers, datasets, and methods
- Identified gaps in conventional systems:
  - Heavy reliance on fixed thresholds
  - Lack of head pose analysis and temporal behavior modeling
  - Limited personalization and robustness in real-world conditions

Objective

The objective of this project is to design and develop a robust, real-time driver monitoring system capable of detecting driver drowsiness and distraction using visual cues such as eye blink patterns and head pose. The system will enhance safety by providing accurate detection and timely alerts while addressing limitations of threshold-based and simplistic models.

Motivation

Driver fatigue and distraction are significant contributors to road accidents worldwide. Current driver monitoring solutions commonly depend on fixed thresholds and lack adaptability to individual differences, varied lighting, and dynamic driving conditions. This project is motivated by the need for an intelligent and adaptive monitoring system that leverages computer vision and machine learning techniques to improve accuracy, personalization, and robustness in driver behavior analysis.

Tools and Technologies

- Programming Language: Python
- Computer Vision Libraries: OpenCV, Dlib, MediaPipe
  Machine Learning: TensorFlow / PyTorch
- Face & Landmark Detection: Facial landmark extraction for eye region and head pose

estimation
- Development Environment: Jupyter Notebook / VS Code

Dataset Used

- Yawn & Eye Dataset from Kaggle – a collection of labeled eye states and yawning images for drowsiness and blink detection.
  Link: https://www.kaggle.com/datasets/serenaraju/yawn-eye-dataset-new

Plans for next week:

- Study and compare detection approaches including:
  - Eye Aspect Ratio (EAR) based drowsiness detection
  - Head pose estimation for distraction
  - Computer vision pipeline using facial landmarks
- Prepare implementation workflow diagrams

References:

1. https://www.kaggle.com/datasets/serenaraju/yawn-eye-dataset-new
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3. Karthigavani, N., Christober, S., Dhanesh, S. and Dhanush, P.S.R., 2025, July. A hybrid accident prevention framework towards Driver Fatigue and Distraction Detection using YoloV10 architecture. In *2025 2nd International Conference on New Frontiers in Communication, Automation, Management and Security (ICCAMS)* (pp. 1-6). IEEE.
4. Karthigavani, N., Christober, S., Dhanesh, S. and Dhanush, P.S.R., 2025, July. A hybrid accident prevention framework towards Driver Fatigue and Distraction Detection using YoloV10 architecture. In *2025 2nd International Conference on New Frontiers in Communication, Automation, Management and Security (ICCAMS)* (pp. 1-6). IEEE.
5. Kurian, A.T. and Soori, P.K., 2023, March. AI-Based Driver Drowsiness and Distraction Detection in Real-Time. In *2023 International Conference on Computational Intelligence and Knowledge Economy (ICCIKE)* (pp. 13-18). IEEE.
6. Nasser, M., Rashid, T., Ghanem, A., Saeedi, H. and Mahasneh, H., 2025, January. Design and Implementation of a Driver Drowsiness Detection System to Prevent Accidents Using Machine Vision. In *2025 IEEE International Conference on Consumer Electronics (ICCE)* (pp. 1-3). IEEE.

Signature of Student   **Signature of Mentor**