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INSTITUTE OF SCIENCE & TECHNOLOGY
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TITLE SELECTION REPORT

Degree	**B.Tech**
Department	**Computer Science and Engineering**
Year	**IV**
Section	**A**
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Submitted to Guide,
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Project Title 3:

Driver Drowsiness Detection System

1. Introduction:

Road accidents are one of the leading causes of fatalities worldwide, and a major percentage of them are due to driver fatigue and drowsiness. Long driving hours, lack of sleep, and monotonous routes often make drivers lose focus, leading to severe consequences. A Driver Drowsiness Detection System aims to reduce such risks by continuously monitoring the driver's behavior using computer vision and alerting them when signs of drowsiness are detected. This proactive approach can help prevent accidents, save lives, and improve road safety.

2. Area/Domain:

Our project falls under the domains of **Artificial Intelligence (AI)**, **Computer Vision**, **Deep Learning** and **Internet of Things (IoT) (if integrated with car alert system)**

3. Abstract:

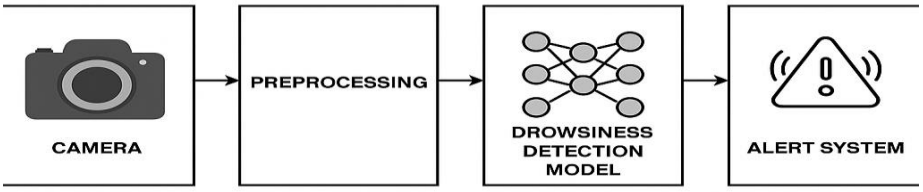
The proposed project focuses on developing an AI-powered Driver Drowsiness Detection System that uses a camera to monitor the driver's facial features, such as eye closure, blinking rate, and head movements. By applying deep learning models (like CNN or LSTM), the system can detect early signs of fatigue and trigger alerts such as alarms, vibrations, or notifications to ensure driver safety. Transfer learning will be used for efficient model training with pre-trained models like MobileNet, VGG16, or ResNet. The final solution can be deployed as a real-time application, potentially integrated into vehicles, providing an affordable and effective road-safety measure..

5. Objectives:

- To design and implement a system that can detect drowsiness in real-time
- To develop a deep learning model capable of analyzing facial landmarks and eye closure patterns..
- To provide timely alerts to the driver to avoid accidents.
- To ensure high accuracy by training on diverse datasets containing different lighting conditions, face angles, and demographics.
- To create a prototype that can be extended for real-world vehicle integration

6. Methodology with Diagram:

- **Image Capture:** A webcam or camera continuously records the driver's face.
- **Preprocessing:** The captured frames are converted to grayscale/normalize
- **Feature Extraction:** Eye aspect ratio (EAR), mouth yawning detection, and head pose estimation
- **Model Analysis**: A CNN/LSTM model classifies the state as *"Alert"* or *"Drowsy."*
- **Alert Mechanism:** If drowsiness is detected, the system activates an alarm/buzzer or visual alert



7. Expected Outcomes:

- A real-time system that accurately detects driver drowsiness.
- A user-friendly prototype with clear alert signals (sound or vibration).
- Improved road safety by reducing accidents caused by driver fatigue.
- A deployable solution that can be further enhanced for commercial vehicles, public transport, and logistics sectors.