



RAJIV GANDHI UNIVERSITY OF KNOWLEDGE TECHNOLOGIES-SRIKAKULAM

MAJOR PROJECT

Driver Fatigue Monitoring System

Under the Guidance of:

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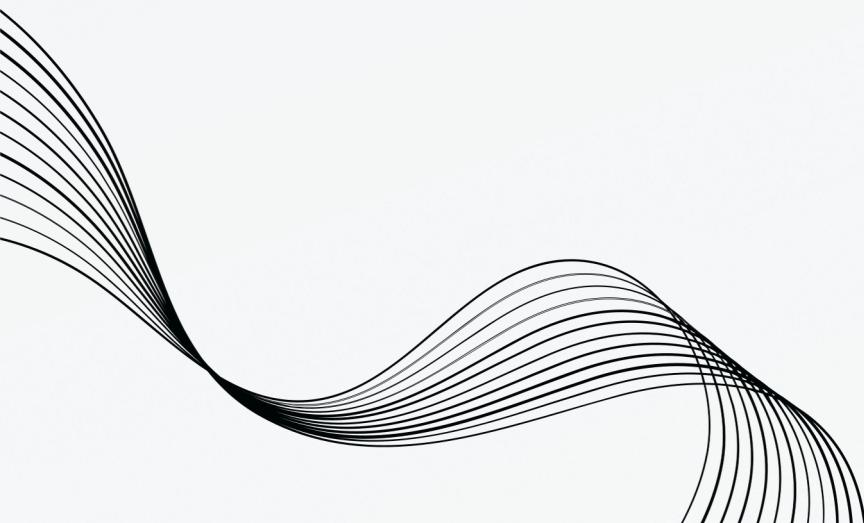
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ABSTRACT

Driver drowsiness is a major cause of road accidents worldwide, posing a significant threat to road safety. Detecting fatigue in drivers early can prevent accidents and save lives. This project creates a real-time Driver Fatigue Monitoring System that uses Convolutional Neural Networks (CNN) to track signs of driver fatigue. The system uses a webcam to capture video of the driver and checks facial features such as eye openness, blinking, and mouth movement. These features are then analyzed by the CNN to determine if the driver is alert or drowsy.

When drowsiness is detected, the system sends an alert message to warn the driver to take a break or stop driving. This solution is cost-effective, easy to use, and works in real-time. It provides an accurate way to monitor driver fatigue and improve road safety by preventing accidents caused by tired drivers.



PROBLEM STATEMENT

Road accidents caused by human errors lead to many deaths and injuries worldwide. One major cause is driver drowsiness, often due to lack of sleep or long driving hours. To reduce these accidents, it is important to create a system using modern technology to help prevent them.

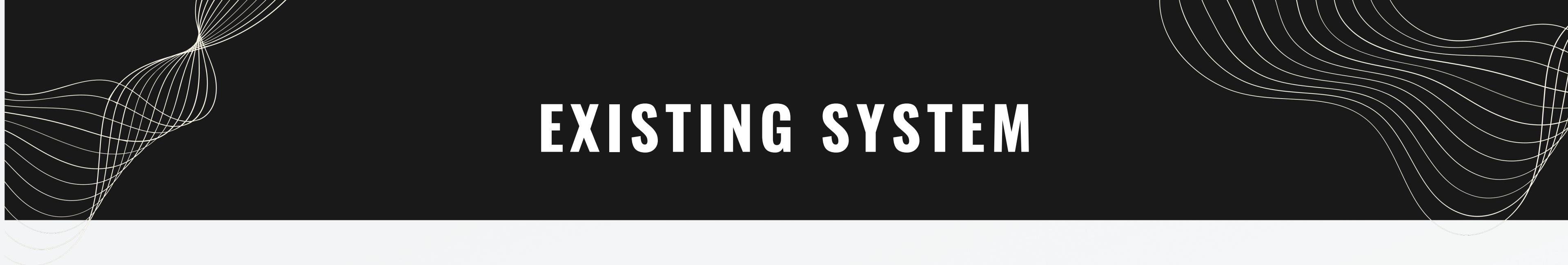


GOAL OF THE PROJECT

The main goal of this project is to prevent accidents caused by driver drowsiness. The system detects when a driver is getting drowsy and sends an alert to warn them. This helps the driver recognize their tiredness and take a break. It provides an accurate way to monitor driver fatigue and improve road safety by preventing accidents caused by tired drivers. Ultimately, it makes driving safer for everyone on the road.

INTRODUCTION

Many road accidents which lead to death are because of drowsiness while driving. Drivers who drive long hours like truck drivers, bus drivers are likely to experience this problem. It is highly risky to drive with lack of sleep and driving for long hours will be more tiresome. Due to the drowsiness of the driver causes very dangerous consequences, it is estimated that 70,000 to 80,000 injures & crashes happen worldwide in a year. Even deaths have reached 1000-2000 every year. There are many unofficial deaths which are not confirmed by drivers that it was due to their drowsiness. This takes lives of many innocent people. It is very important to identify the driver drowsiness and alert the driver to prevent crash.

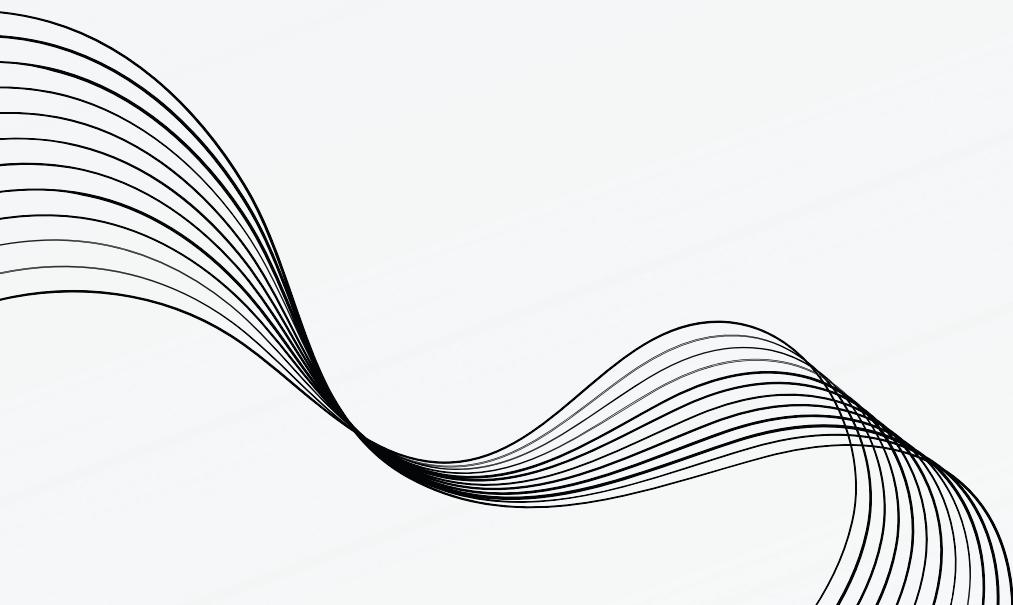


EXISTING SYSTEM

- **Vehicle-Based Monitoring:** Tracks car movement, like steering, the accelerator or vehicle or pattern of vehicle brakes to detect drowsiness but can give false alerts due to minor vehicle movements.
- **Facial Behavior Monitoring:** Uses cameras to detect eye closure or yawning, but struggles in poor lighting or if the driver's face is obscured.
- **Physiological Monitoring:** Measures heart rate or brain activity with sensors, but it is expensive and uncomfortable for the driver.
- **Support Vector Machine(SVM):** Analyzes facial features with algorithms like SVM, but may not perform well in changing conditions or with limited data.

DISADVANTAGES

- Expensive
- Uncomfortable
- Inaccurate
- Inconsistent



PROPOSED SYSTEM

- **Camera Input:** The system uses a webcam to capture the driver's face in real-time.
- **Facial Feature Analysis:** It analyzes key features like eye blink rate, eye openness, and mouth movement to determine if the driver is drowsy.
- **Convolutional Neural Network(CNN):** A CNN model is trained to detect drowsiness by learning from facial images. The model classifies the driver's condition as either “drowsy” or “alert.”
- **Alert System:** If drowsiness is detected, the system sends an alert (e.g., a sound or message) to warn the driver.
- **Real-Time Performance:** The system runs in real-time and can be integrated with existing vehicle systems, making it a cost-effective and practical solution for improving road safety.

ADVANTAGES:

- Low cost (only a webcam needed).
- Works in real-time with high accuracy.
- Can operate under various lighting conditions and driver positions.
- Sends alerts to prevent accidents caused by drowsy driving.

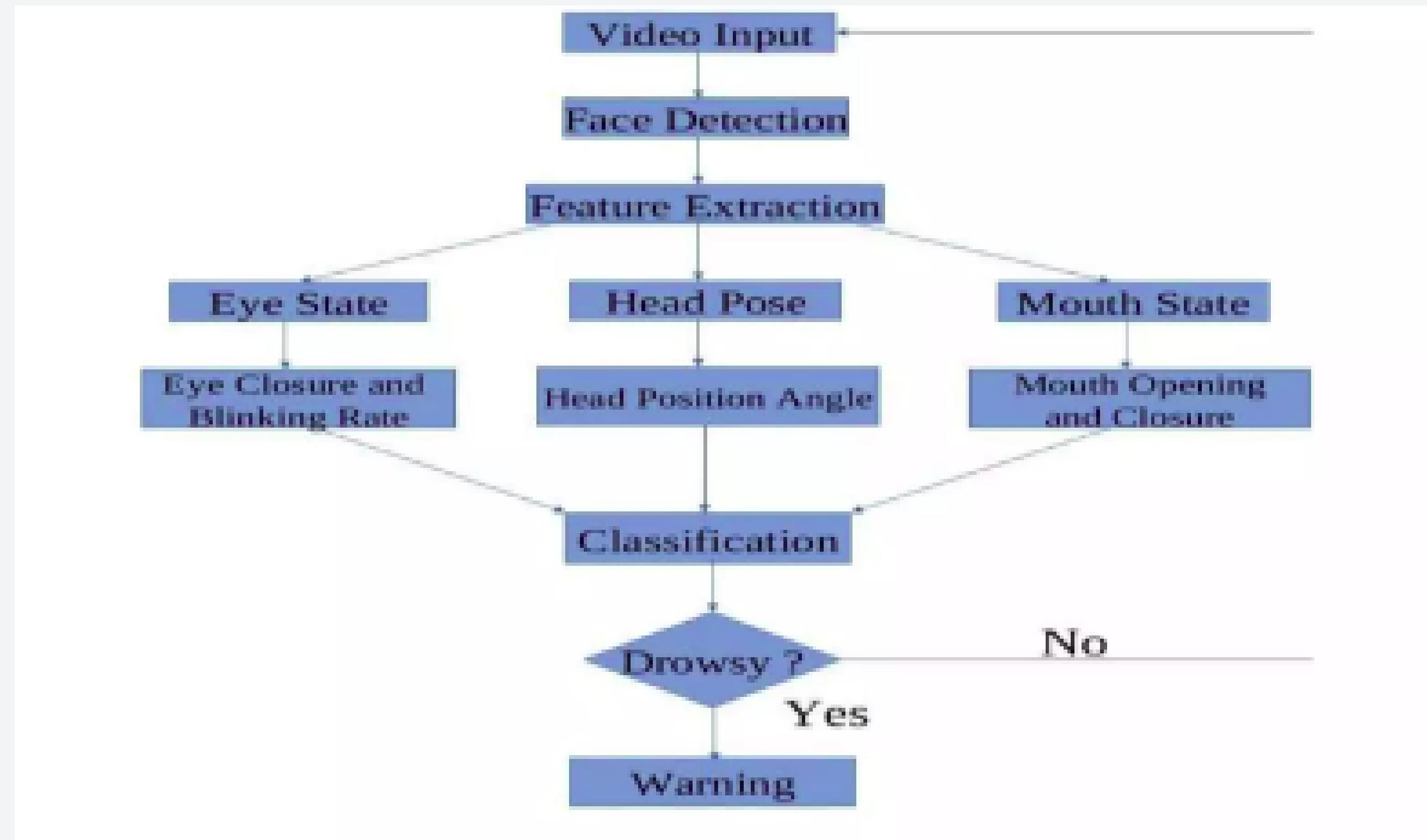




METHODOLOGY

- **Convolutional Neural Network(CNN)** is a type of deep learning model commonly used in image classification, object detection, and other computer vision tasks.
- **OpenCV** is used for image and video processing.
- **TensorFlow** is used for building, training, and evaluating machine learning models, especially deep learning models like neural networks.
- **Libraries:** numpy, matplotlib

FLOW CHART:



FUTURE SCOPE:

- **Automated Alert System:** When drowsiness is detected, the system can send an automated email to pre-specified relatives or emergency contacts, providing information about the driver's condition and location.
- **Adaptation for Other Applications:** The technology can be adapted for use in platforms like Netflix or streaming services to pause videos when a user falls asleep, enhancing user experience.

REFERENCES

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- K. Satish, A. Lalitesh, K. Bhargavi, M. S. Prem and T. Anjali., "Driver Drowsiness Detection," 2020 International Conference on Communication and Signal Processing (ICCSP), 2020, pp. 0380- 0384, doi: 10.1109/ICCSP48568.2020.9182237.

CONCLUSION:

The Driver Drowsiness Monitoring System helps prevent accidents caused by tired drivers. It uses a webcam and machine learning to check the driver's face for signs of drowsiness, like eye blinking or mouth movement. If the driver is getting tired, the system sends a warning to alert them.

This system is easy to use and cost-effective, making it suitable for many types of vehicles. It works well in different lighting and driver positions, ensuring accurate results. In the future, the system can be improved with more sensors and better technology, helping keep drivers safe on the road.



THANK YOU