**Driver Drowsiness Detection System**

Drowsy driving is one of the common causes of road accidents resulting in injuries, even

death, and significant economic losses to drivers, road users, families, and society. There have been

many studies carried out in an attempt to detect drowsiness for alert systems.

**Driver drowsiness detection using ANN image processing:**

They present the prospect of developing a drowsiness detection system for car drivers using three types of methods: EEG and EOG data processing, as well as driver picture analysis, in this paper. The authors have described the study on the first two approaches in prior works. They have introduced the possibility of detecting the driver's drowsy or aware condition based on visuals in this study.

Taken while driving and analysing the driver's eye state: open, half-open, and closed two types of artificial intelligence are used for this. A single hidden layer network and an autoencoder network were used as neural networks.

**Microcontroller based driver alertness detection systems to detect drowsiness:**

A fundamental problem for road traffic accident systems is the improvement of embedded systems for detecting and avoiding tiredness in a vehicle. To avoid drowsiness while driving, an alert system that can detect a drop in driver concentration and transmit a signal to the driver is required. According to studies, the majority of traffic accidents occur when the motorist is preoccupied while driving. The author proposed, reviewed, and presented a portable Driver Alertness Detection System (DADS) to estimate the level of concentration of the driver based on colour detection approach employing facial recognition in this study. A small camera will be mounted on the front visor to record facial expressions and eye movements. They mentioned they tested DADS on 26 people and were able to get a 100% detection rate in favourable lighting conditions and a low detection rate at night.

A minimal network structure was proposed based on facial landmarks to identify drowsy drivers. The method presented a lightweight model and achieved an accuracy of more than 80%. This study focused only on eye facial landmarks without detecting the yawning of the drivers. Moreover, the method was based on a multilayer perceptron classifier with three hidden layers, which is a limitation that leads to low accuracy.

Drunk driving is a leading cause of car accidents. Many accidents that result in the loss of life and property can be avoided with a driver fatigue detection system that is designed to trigger an alarm when appropriate. We will be proposing a model that uses deep machine learning techniques to study the eyelid movements, changes of the facial movements, yawing movements to recognize the drowsiness during driving.