Droive : Seek Safety

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Why Droive?

- Many people keep driving on highways day and night. Drivers and people travelling long distances suffer from lack of sleep
- One out of 4 vehicle accidents are caused by drowsy driving and one in 25 adult drivers report that they have fallen asleep at the wheel in the past 30 days.
- Drowsiness detection is a safety technology that can prevent accidents that are caused by drivers who fell asleep while driving

Overview

- Droive web-app detects drowsy state of driver and subsequently alerts to avoid accidents.
- Designed end to end automated pipeline which includes following major building blocks:

  1. State Informer- Captures current state of driver.
  2. State Detector-Detects the state using trained Deep Learning ML model.
  3. Alert Manager-Receives the response from state detector and broadcasts the necessary alerts as per level of seriousness.

Tech Stack

- Keras
- OpenCV
- Flask
- HTML,CSS
- JavaScript
- Bootstrap

DEMO

CNN Model

- Dataset of closed and open eyes images is used.
- Model is trained on 150 epochs with 4846 images.
- There are 3 convolution layers added to CNN model.
- Activation Layers:Relu,Softmax
- Optimizer-Adam
- Accuracy of Model on test data-94.32 percent.

Challenges

- Attaining accuracy in detecting the state of driver using a CNN model
  - Data Augmentation is performed
  - Handle overfitting and underfitting problem
- Triggering the alarm properly
- Email Notification using Flask.

Learnings

- Learnt the architecture of CNN model and trained it to identify eye status as open or closed
- Accessing the webcam and capturing and reading each frame using OpenCV
- Triggering the alarm when the score reached a threshold limit
- Routing in flask
- Running object detection in web browser

Future Scope

- Improving accuracy in dim light.
- Location tracking of user

Reference

- OpenCV documentation
- Keras API Reference
- Flask documentation
- Haarcascade Files
- Animate.css Documentation

THANK YOU