ROAD SAFETY HACKATHON

The Problem we are addressing
Accidents due to Speeding of vehicles

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Our Solution: 3 second rule

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The 3-second rule is implemented so that the driver maintain a safe travelling distance at any speed. It is more a guide to reaction time rather than safe stopping distance.

Github Link

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It is one thing to know the solution and other to actually think and act accordingly.
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Why is it crucial?
A person cannot decide for himself that he is following the 3-second rule. Hence our application guides them.
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Problem Tackling: Alerting when 3-second Rule is not followed

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Implementation

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Implementation

- Getting front view from driver’s perspective using camera
- Using computer vision to find the distance of the car ahead
- Alerting when the 3-second rule is violated
Calculating Distance

- We find the distance of the car ahead by using the width ratio. And assuming that 2 m is the average width of a car. This helps in extending this model to trucks and other heavy vehicles.
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Tools Used

- OpenCV (Open Source)
- Visual Studio
- Dataset for different cars

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DataSet used for training
● University of Illinois (550 images)
● Caltech (600 images)
● Other sources (1500 images)

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Application in action

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A Snap of our Application when the driving is safe

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A Snap of our Application when the 3 second rule is being violated

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Challenges

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Challenges

- Lane Detection
- Proper identification of cars

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Detecting Lane

- Pre-Processing Stage
- Post-Processing Stage
Pre-Processing Stage

- Original Image
- GrayScale Image (Canny Edge Detection)
- Region of Interest (ROI)

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Post-Processing Stage

- Canny Edge Detected Image
- Hough Transform connecting discontinuous lines and differentiating different lines

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Road Lane Modelling

- Computation done to recognize possible right and left lane markers
- Grouping Similar Lines together and getting an average results
- Final Result

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Detecting current lane
Impact

10 Lakh + people were killed in road accidents over the past decade. Our application would greatly be reducing the root cause of all accidents: driver being distracted, and also aiding the more cautious ones and hence help us save many lives.

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Activities to be conducted in next Quarter

- Complete Lane Detection System
- Road Signal symbol identification and alert system
  - Pedestrian Identification
- Identification of Potholes in the road
- More Data of Indian Cars and roads

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