



& **DIAGEO**  
INDIA

PRESENTS



**iSAFE**

IN ASSOCIATION WITH



MINISTRY OF ROAD  
TRANSPORT AND  
HIGHWAYS

&



&



# IIT DELHI

kipDist

*#HumseFarakPadtaHai*

[www.road-safety.co.in](http://www.road-safety.co.in)

# ROAD SAFETY HACKATHON

The Problem we are addressing  
Accidents due to Speeding of vehicles

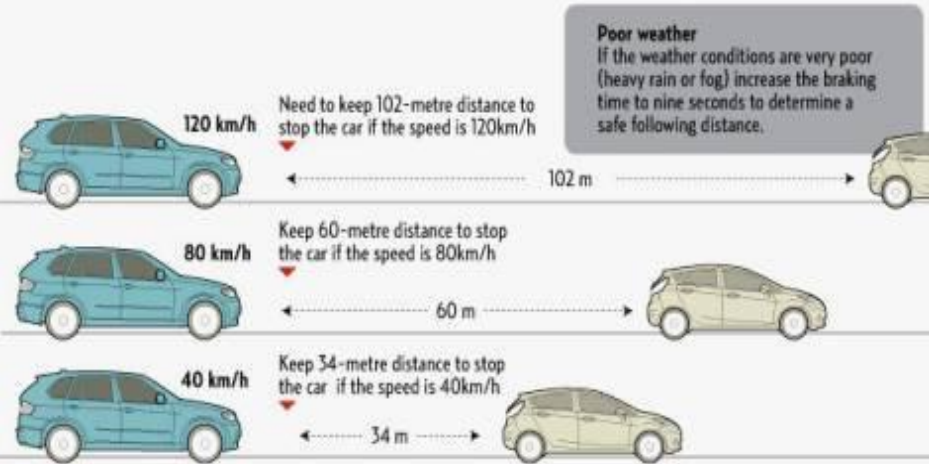
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# ROAD SAFETY HACKATHON

Our Solution : 3 second rule

## Three-Second Rule for safe distance



# ROAD SAFETY HACKATHON



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](#)

# ROAD SAFETY HACKATHON

It is one thing to know the solution and other to actually think and act accordingly.



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# ROAD SAFETY HACKATHON

Why is it crucial?

A person cannot decide for himself that he is following the 3-second rule. Hence our application guides them.

# ROAD SAFETY HACKATHON

Problem Tackling:  
Alerting when 3-second Rule is  
not followed



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# ROAD SAFETY HACKATHON

## Implementation



# ROAD SAFETY HACKATHON

## 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

# ROAD SAFETY HACKATHON

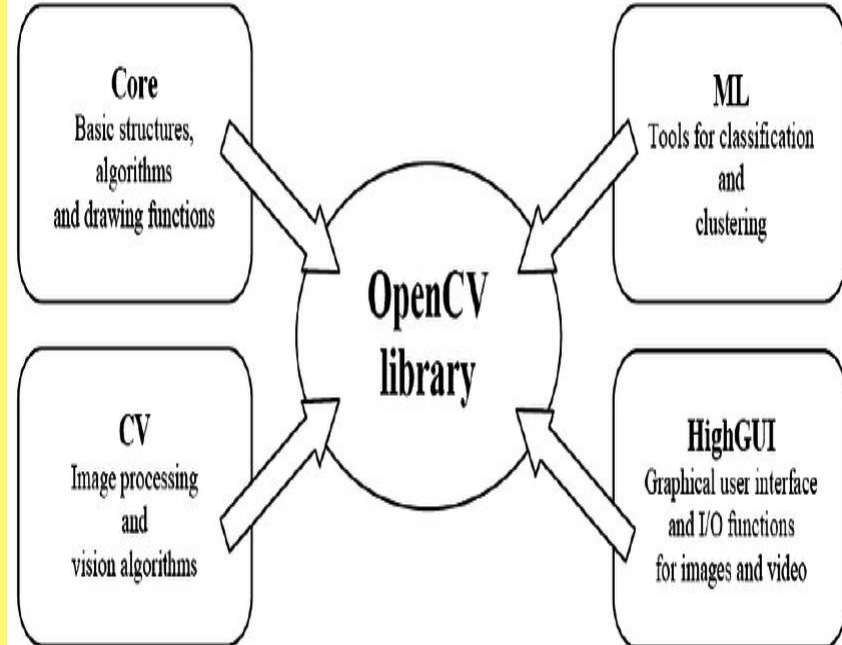
## Calculating Distance

- 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

# ROAD SAFETY HACKATHON

## Tools Used

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



# ROAD SAFETY HACKATHON

## DataSet used for training

- University of Illinois(550 images)
- Caltech (600 images )
- Other sources (1500 images)

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Fei-Fei Li  
@drfeifei



Following

Datasets play crucial roles in advancing AI. #ImageNet helped to enable the latest deep learning advances.

Datasets (First Available)	
adh	Spoken Word (from news articles and other audio) (1992)
Keywords	200,000 handwritten Chinese characters, also "The Extended Hand" (1981)
en English	5.6 billion tokens from Google Web and News corpus (collected by 2010)
ImageNet	5.6 billion tokens from Wikipedia, Wiktionary, Wikisource, and Project Gutenberg collected by 2010
collation	ImageNet corpus of 1.1 million labeled images and 1,000 object categories (2009)
ImageNet	ImageNet corpus of 1.1 million labeled images and 1,000 object categories (2009)
by	ImageNet corpus of 1.1 million labeled images and 1,000 object categories (2009)
date	ImageNet corpus of 1.1 million labeled images and 1,000 object categories (2009)
length	3 years

### Datasets Over Algorithms

Content without method leads to fantasy; method without content to empty sophistry. — Johann Wolfgang von Goethe ("Maxims and Reflections", 1892) "Perhaps the most important... spacemachine.net

RETWEETS  
102

LIKES  
174



11:12 PM - 21 Apr 2016



2



102



174



...

# ROAD SAFETY HACKATHON

Application in action

# A Snap of our Application when the driving is safe



POLICE  ACTIVITY

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



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# ROAD SAFETY HACKATHON

## Challenges



# ROAD SAFETY HACKATHON

## Challenges

- Lane Detection
- Proper identification of cars

# ROAD SAFETY HACKATHON

## Detecting Lane

- Pre-Processing Stage
- Post-Processing Stage

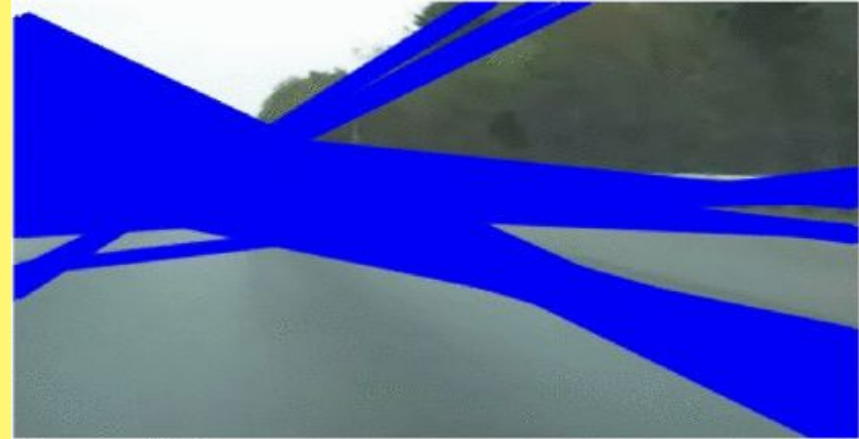
# Pre-Processing Stage

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



# Post-Processing Stage

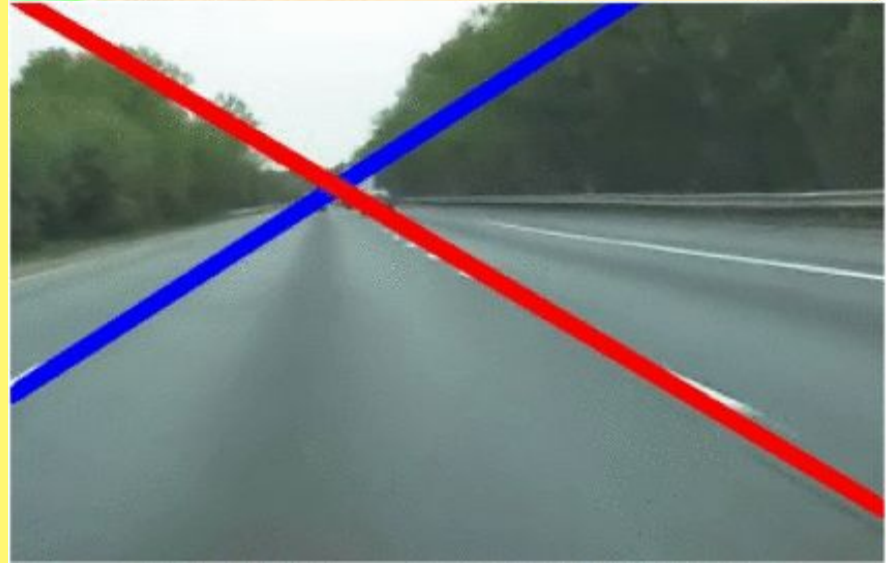
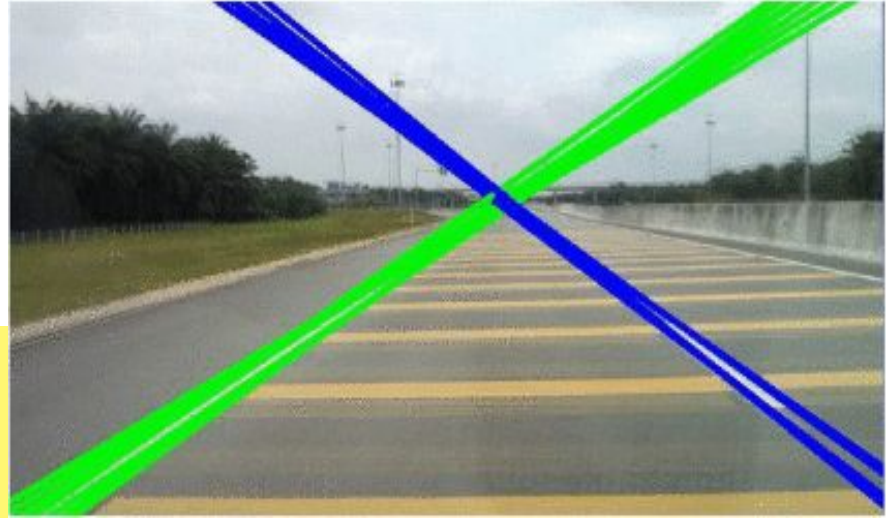
- Canny Edge Detected Image
- Hough Transform connecting discontinuous lines and differentiating different lines



Hough transform detects relevant lines representing left and right lane markers.

# Road Lane Modelling

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



# Detecting current lane

HOUGH BEFORE FILTERING



# 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.

# 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



# DEMO