

# DRIVER DISTRACTION DETECTION

## Abstract

Driver distraction is a major cause of road accidents. Our system uses image data to classify driver behavior into 10 categories, distinguishing between safe and distracted driving. It also detects the specific type of distraction—such as texting, phone use, or reaching behind—using deep learning techniques.

## Introduction

Distracted driving leads to thousands of accidents yearly. Detecting distractions in real time enables intervention and prevention. This project applies computer vision and deep learning to classify driver behavior from in-vehicle images.

## Methodology

We used the State Farm Distracted Driver Dataset (Kaggle). It includes 22,424 images across 10 classes.

### Data Preprocessing

- Images were resized before going into input layer of each model

### Data Augmentation

- Different transformations were added at random like rotations, zooms and shifts.

### Training

#### Model 1: Custom CNN

- Four convolutional blocks with LeakyReLU, Batch Normalization, Max Pooling, and Dropout

#### Model 2: EfficientNetB3

#### Model 3: ResNet50

## Results

- All models evaluated using training and validation accuracy/loss
- EfficientNetB3 train:80.06 val:74.89
- CNN :train 90.75 val:94.02
- ResNet50 train:98.61 val:0.9877



## Conclusion

In conclusion, we were able to try 3 methods to train a successful model the convolutional neural network that we made and discussed which showed lower accuracy but worse predictions were most outputs were wrong while the EfficientNetB3 showed higher accuracy and had a high correct accuracy on the test data and Resnet50 which showed the best accuracy but preformed poorly on Predictions.

## References

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