DISTRACTED DRIVER DETECTION

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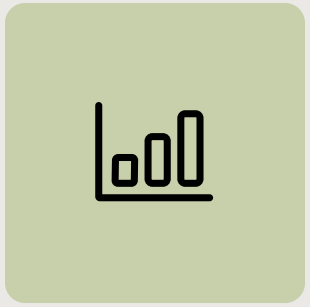
AGENDA

Business Problem

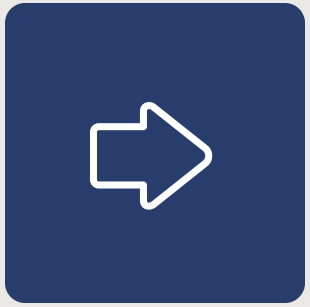
Data Understanding



Data Analysis

Modeling

Limitations



Next steps

BUSINESS PROBLEM

THERE ARE THREE MAIN TYPES OF DISTRACTED DRIVING

1. Visual: taking your eyes off the road
2. Manual: taking your hands off the wheel
3. Cognitive: taking your mind off driving

BUSINESS PROBLEM

Distracted driving kills

9 PEOPLE PER DAY

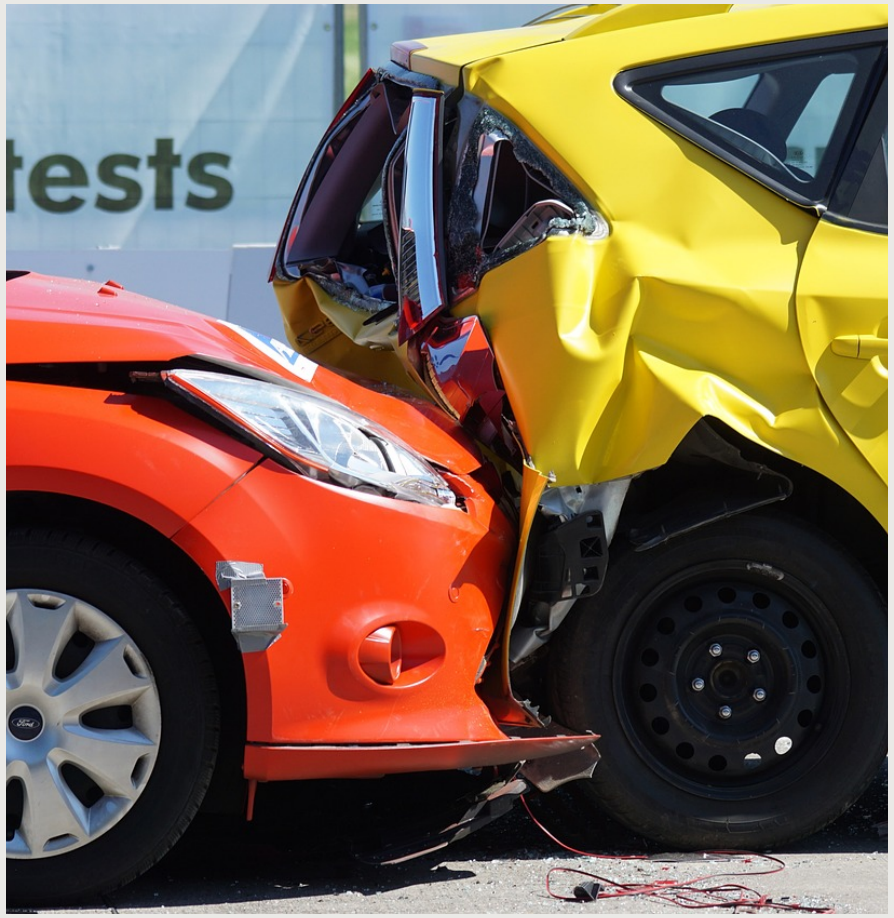
Number of people injured from distracted driving

424,000 PEOPLE

Victims of a distracted driver accident while outside their vehicle

1 IN 5

BUSINESS PROBLEM



STAKEHOLDER:

State Farm

PROPOSAL:

Dashboard camera to detect distracted driving

INCENTIVE:

Safe driving practices = Better car insurance

DATA UNDERSTANDING

- Data Source: Kaggle
- Train Size: 17943 images
- Validation Size: 4481 images
- Test Size: 338 images
- Number of Classes: 10

DATA UNDERSTANDING

CLASSIFICATIONS

c0: Safe Driving

c1: Texting with right hand

c2: Talking on the phone with right hand

c3: Texting with left hand

c4: Talking on the phone with left hand

c5: Operating the radio

c6: Drinking a beverage

c7: Reaching behind

c8: Hair and makeup

c9: Talking to passenger

DATA UNDERSTANDING

safe driving (c0)

texting - right hand (c1)

talking on the phone - right hand (c2)

texting - left hand (c3)

talking on the phone - left hand (c4)

operating the radio (c5)

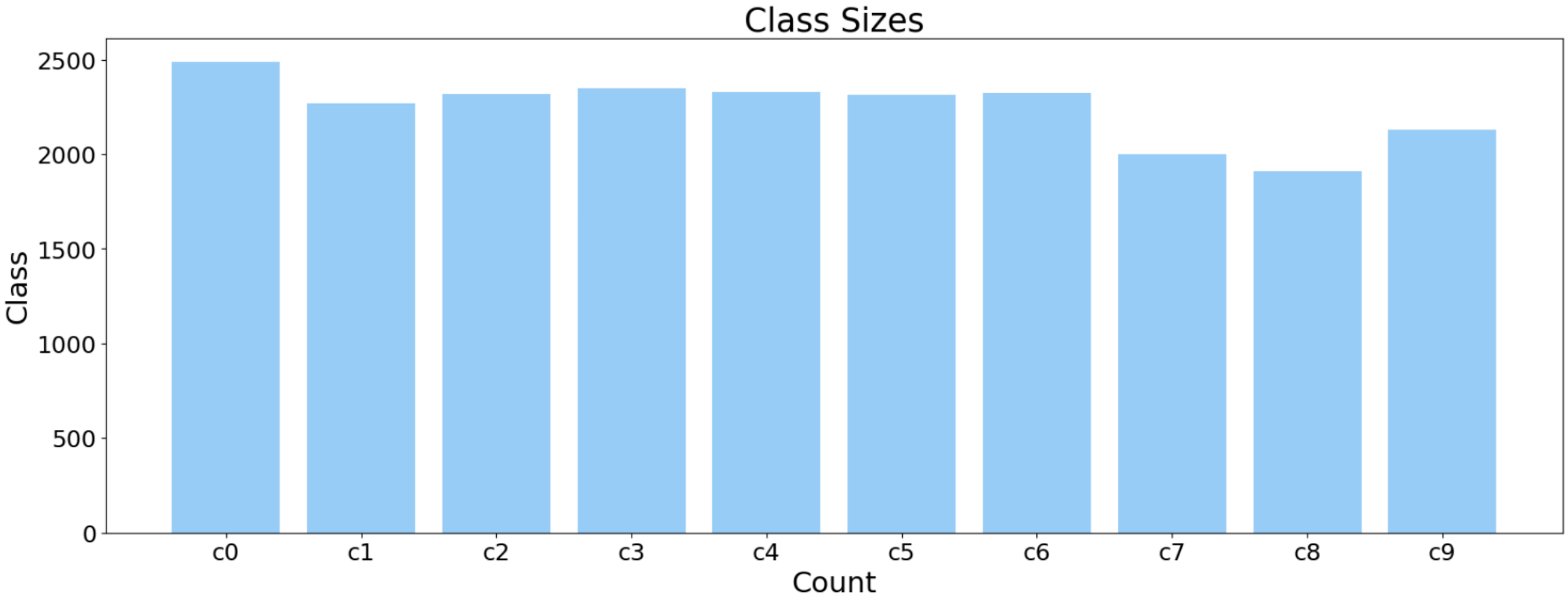
drinking a beverage (c6)

reaching behind (c7)

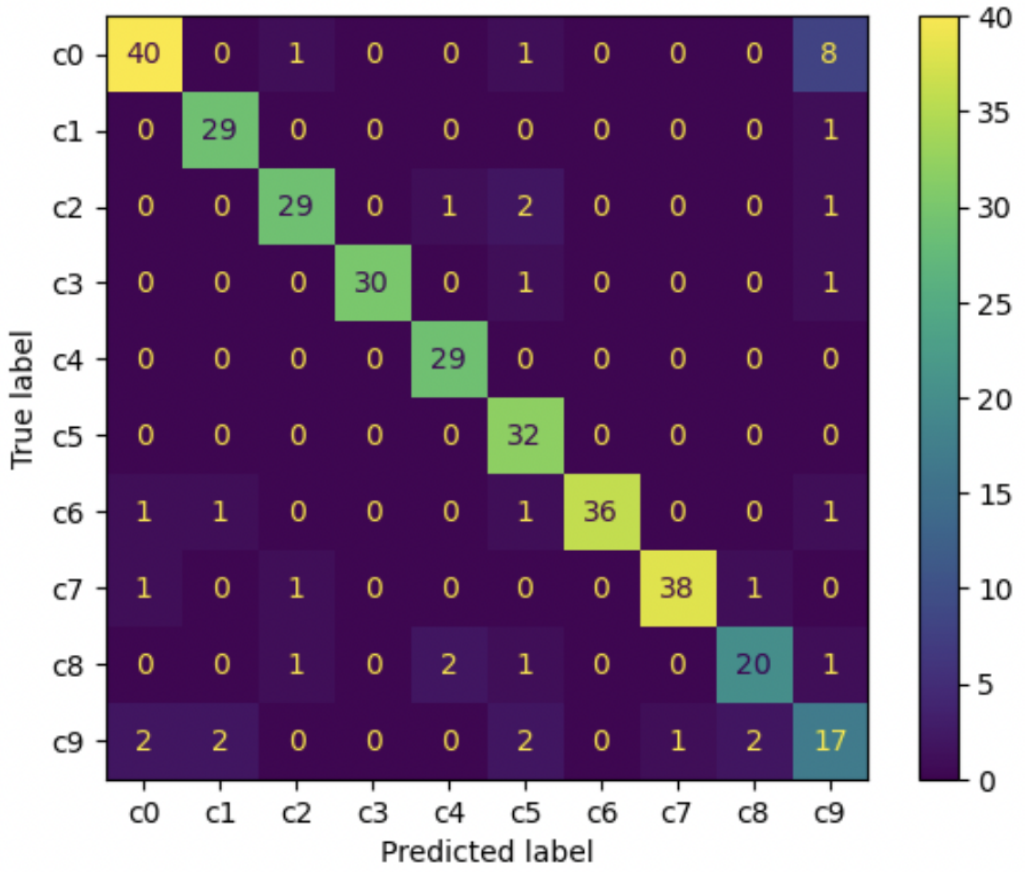
hair and makeup (c8)

talking to passenger (c9)

DATA ANALYSIS



MODELING



Train Accuracy Score: 1.00

Train Loss: 2.7420e-07

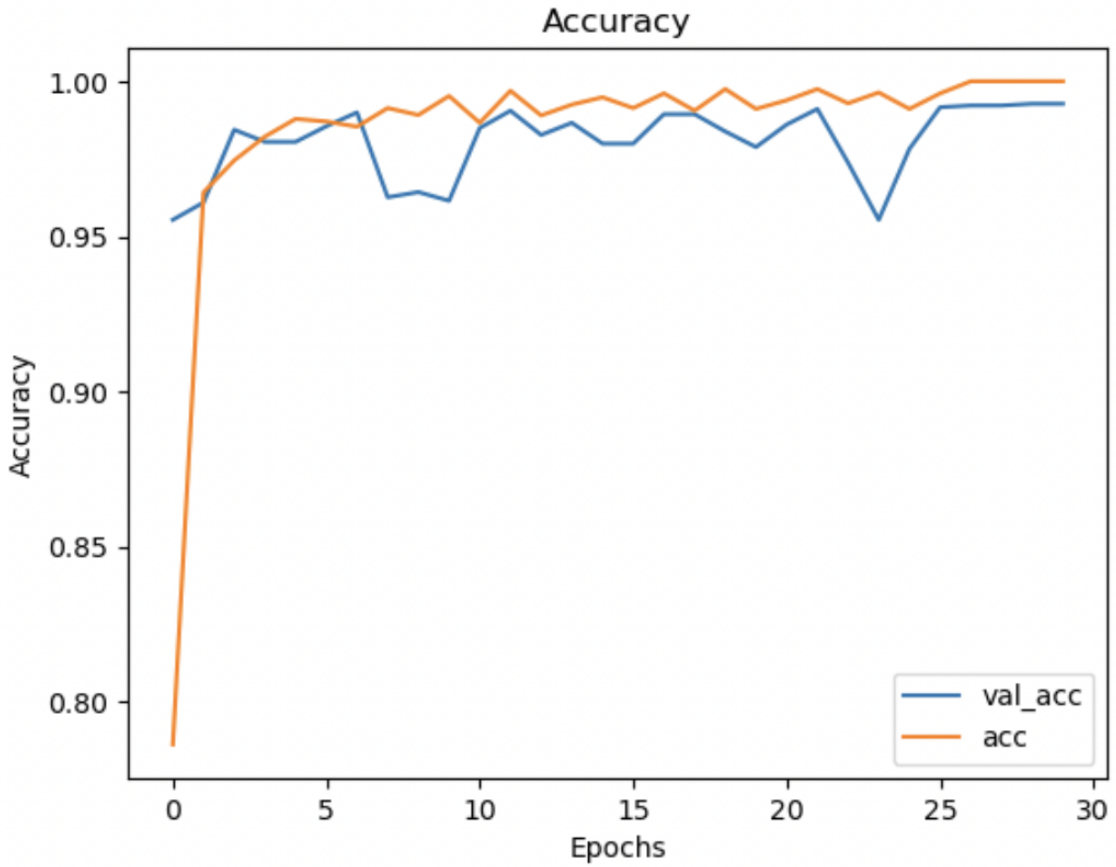
Validation Accuracy Score: 0.9927

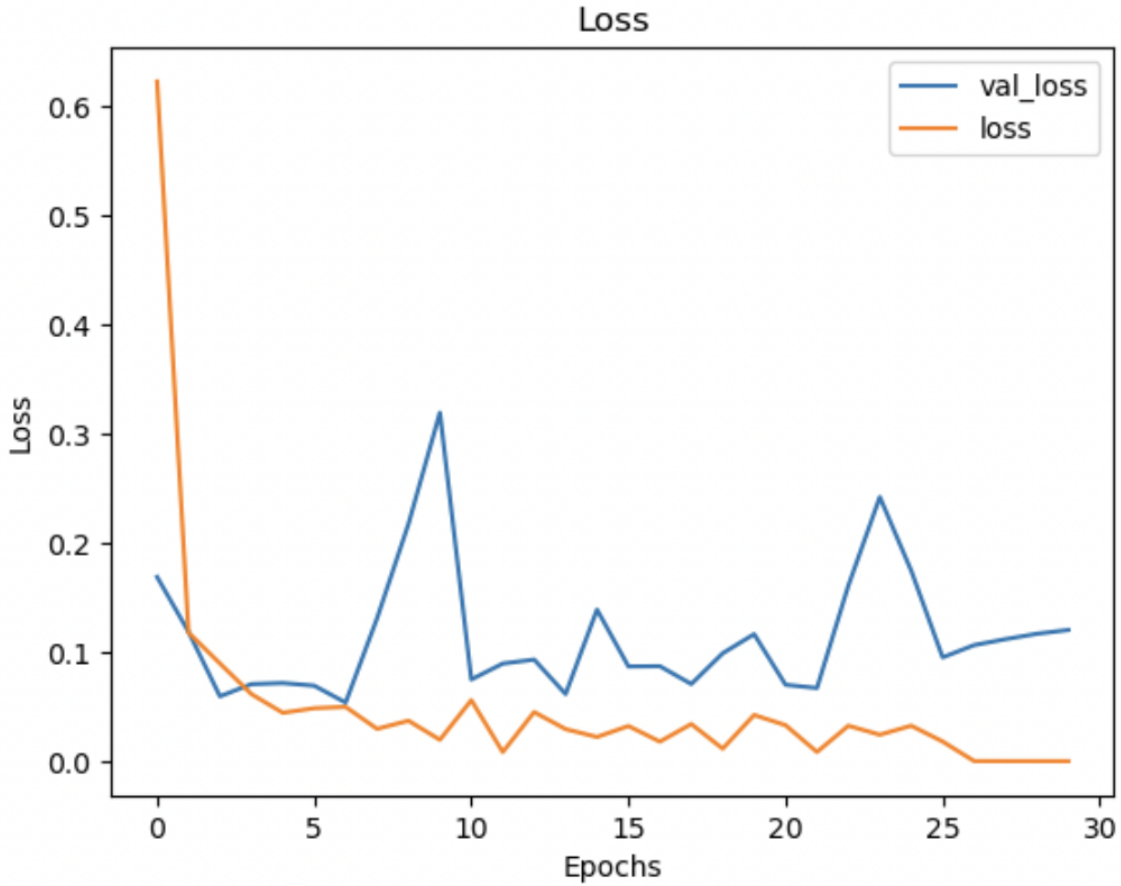
Validation Loss: 0.1202

Test Accuracy Score: 0.8876

Test Loss: 1.7527

MODELING


Accuracy
1.00
0.95
0.90
0.85
0.80
Accuracy
0
5
10
15
20
25
30
Epochs
val_acc
acc


Loss
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Loss
0
5
10
15
20
25
30
Epochs
val_loss
loss

LIMITATIONS

1. The test images had to be manually labeled, and as a result, the size of the test data is small

2. The images are from a single angle, so in practice, the State Farm DashCam would need to be positioned the same way

NEXT STEPS

1. Obtain a greater amount of labeled test data
2. Build the model based on images from various angles
3. Analyze a potential relationship between the use of a DashCam and improvements in driving behaviors

CONTACT INFORMATION

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