

# State Farm Distracted Driver Testing

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# Introduction: The Dangers of Distracted Driving

- Includes texting, talking on the phone, operating radio, drinking, etc.
- According to the National Highway Traffic Safety Administration, distracted driving resulted in 3,522 deaths and 362,415 injuries in 2021.















Link: [State Farm Distracted Driver Detection | Kaggle](#)

# The Dataset

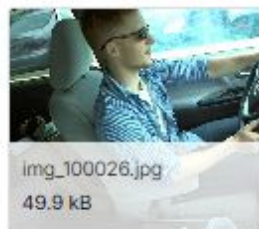
## Data Explorer

4.31 GB

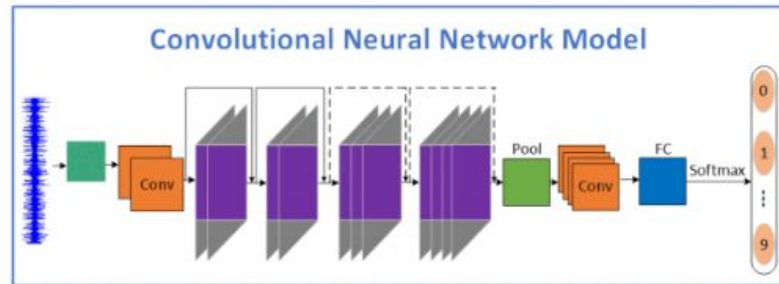
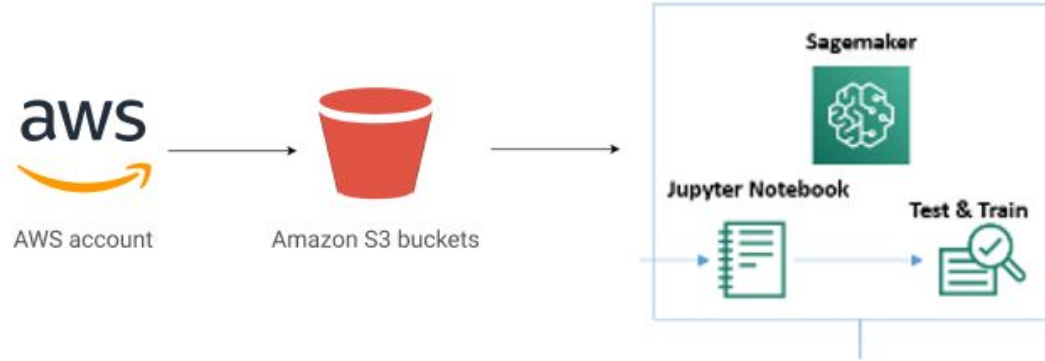
- ▼  imgs
  - ▶  test
  - ▼  train
    - ▶  c0
    - ▶  c1
    - ▶  c2
    - ▶  c3
    - ▶  c4
    - ▶  c5
    - ▶  c6
    - ▶  c7
    - ▶  c8
    - ▶  c9

 driver\_imgs\_list.csv

 sample\_submission.csv

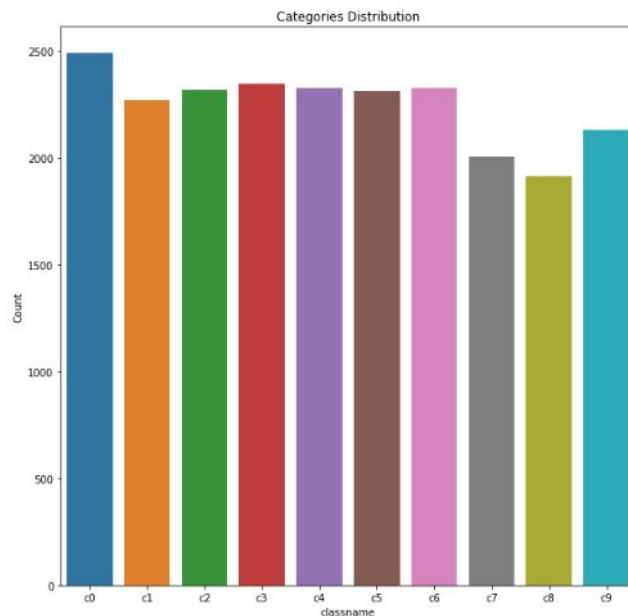


# AWS Services



# Data Pre-Processing

- Resize images to be consistent (180x180 or 256x256 pixels)
  - Included to see if size affected the analysis (testing whether photos contain enough information for the models)
- Normalize the pixel data (1.0/255)
- Convert images to grayscale, when applicable
- Set limiting factor for all classes
  - Class with the least number of images
  - Allows for balance across the classes

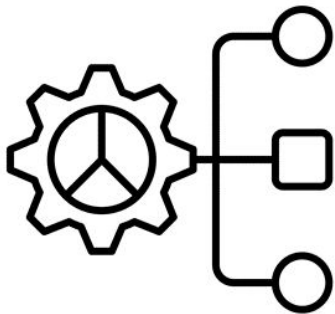


# Data Analysis/Data Processing

- Model 1
  - RELU activation
  - 16 filters
  - Adam optimizer
  - Color (RGB)
- Model 2
  - TANH activation
  - 16 filters
  - Adam optimizer
  - Color (RGB)
- Model 3
  - RELU activation
  - 16 filters
  - Adam optimizer
  - Color (Greyscale)
- Model 4
  - TANH activation
  - 16 filters
  - Adam optimizer
  - Color (Greyscale)

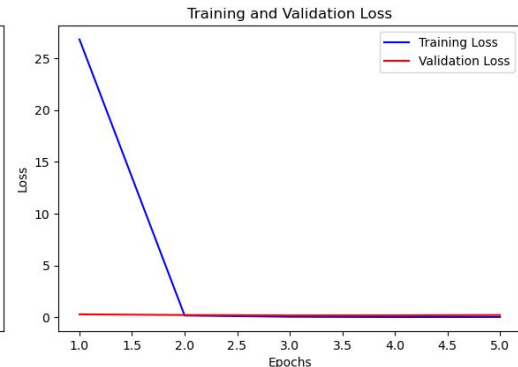
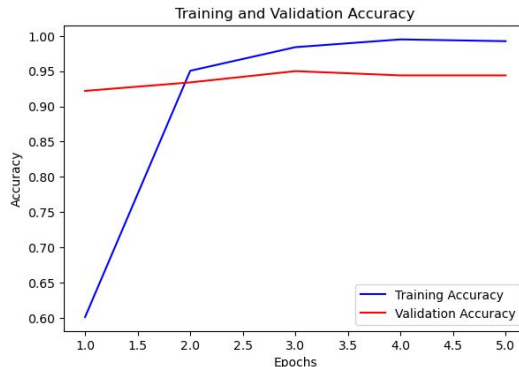
# Testing

- Test Model Architecture:
  - This test ensures the model architecture matches the expected architecture.
  - Checks if the model has the correct number of layers and the types of layers
- Test Data Processing:
  - This test is verifying if the data preprocessing function correctly processes the input data before feeding it into the CNN model. (e.g. resizing, normalization)



# Results

- Strengths:
  - Robustness
  - Accuracy: 98%
- Limitations:
  - Frequent crashes and slow (issues w/large dataset)
  - Future improvements on model include adopting transfer learning methods, data augmentation
- Real World Applications:
  - **Policy:** Inform government policies with stricter penalties for offenders of distracted driving
  - **Technology Development:** Alert driver or trigger safety systems to prevent accidents





Thank you!