CNN Emotion Classification

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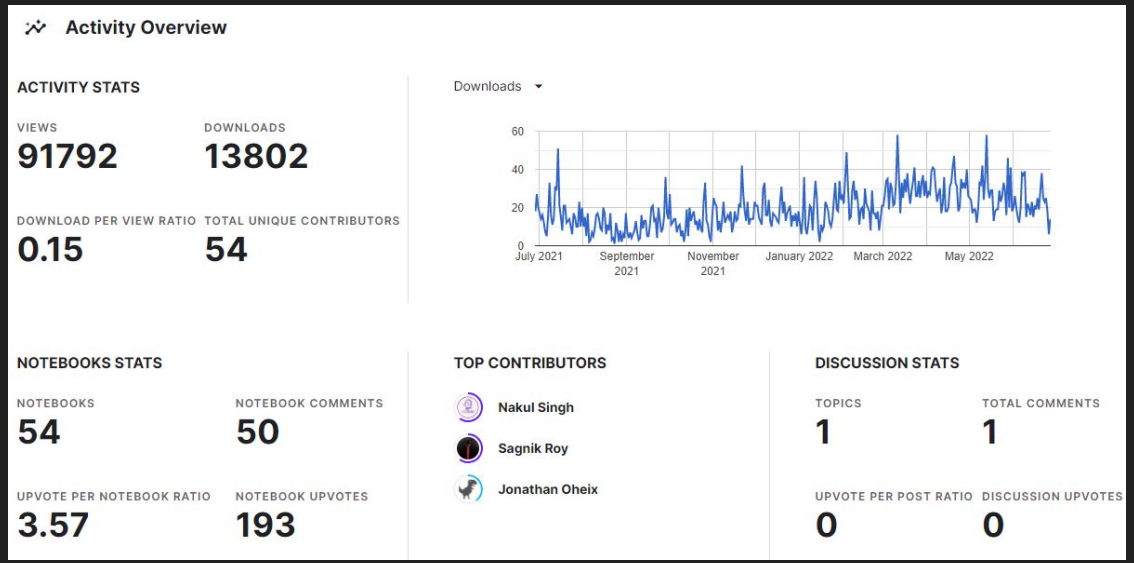
The Data - Face expression recognition dataset

- from Kaggle (https://www.kaggle.com/datasets/jonathanoheix/face-expression-recognition-dataset)



Data - continued

- Dataset contains one train one validation folder consisting of 7 emotion categories - **angry**, disgust, fear, **happy**, **neutral**, sad, surprise
- Each emotion category in the training folders holds around 3993 pictures
- Each emotion cateogry in the validation folders holds around 960 pictures
- Pictures were 48x48 grayscale jpeg images:




CNN Framework

- Input Image
  - img_rows, img_cols = 48, 48
  - input_shape = (img_rows, img_cols, 1)
- Number of classes, batch size, epochs
  - num_classes = 3
  - batch_size = 50
  - epochs = 200

CNN Framework - continued

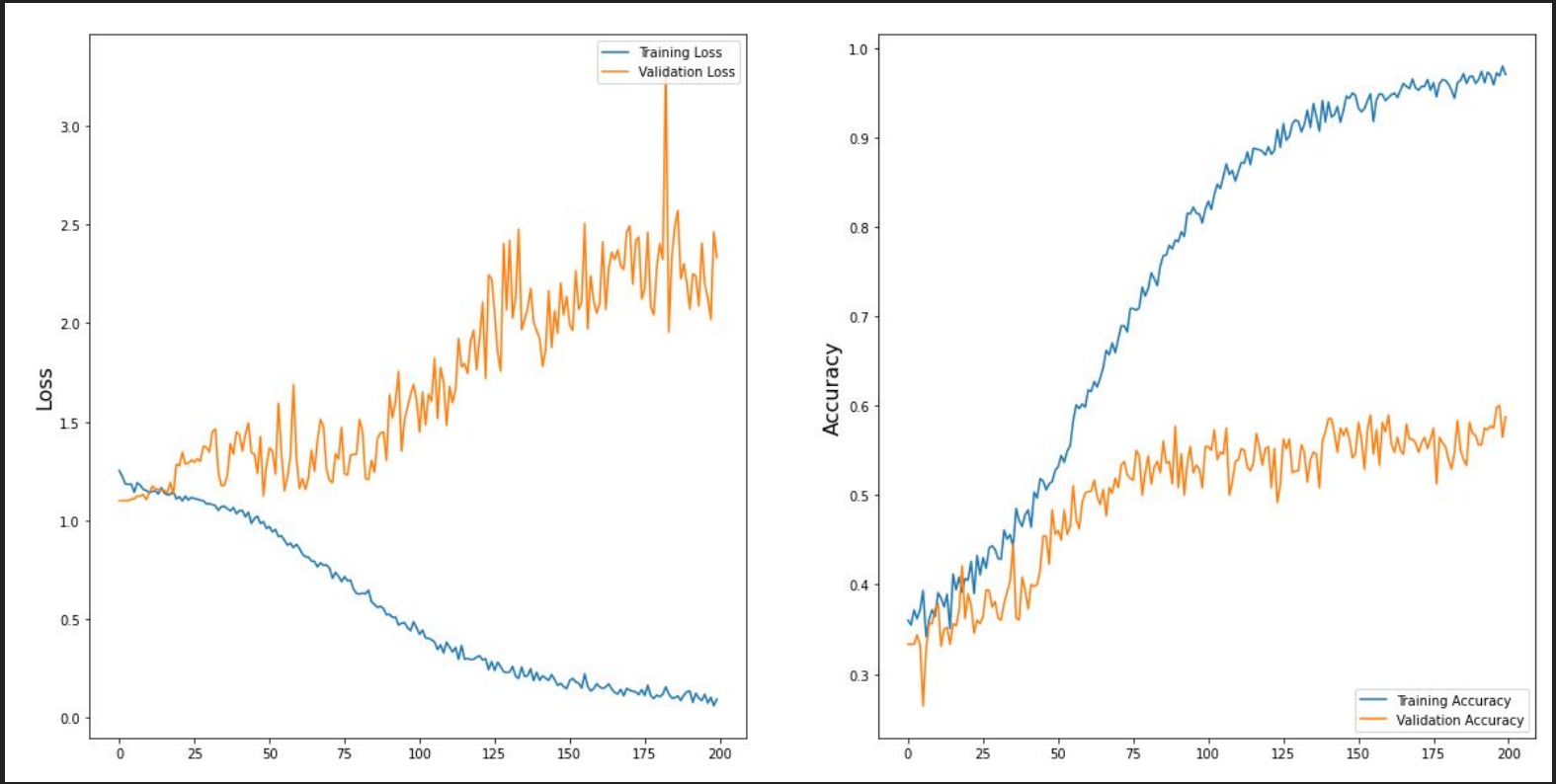
- 3 CNN layers
  - Convolution2D - 128,128, 256 kernel detectors, kernal size 3x3
  - ‘relu’ activation
  - Max Pooling 2x2
  - no dropouts (data not imbalanced, adds extra running time)
- Flatten
- 12 Fully connected layers
  - 256 neurons, 1024 neurons in last layer
  - ‘relu’ activation
  - no dropouts
- Output layer
  - ‘softmax’ activation, number of classes = 3

Compile model

- Categorical crossentropy
- RMSprop optimizer, learning rate = 0.0001
- metrics measured in ‘accuracy’
  - Total params: 2,434,435
  - Trainable params: 2,425,731
  - Non-trainable params: 8,704

```
Epoch 196/200
38/38 [==============================] - 27s 700ms/step - loss: 0.1157 - accuracy: 0.9583 - val_loss: 2.1978 - val_accuracy: 0.5750
Epoch 197/200
38/38 [==============================] - 27s 701ms/step - loss: 0.0722 - accuracy: 0.9717 - val_loss: 2.1265 - val_accuracy: 0.5979
Epoch 198/200
38/38 [==============================] - 27s 717ms/step - loss: 0.1008 - accuracy: 0.9683 - val_loss: 2.0186 - val_accuracy: 0.6000
Epoch 199/200
38/38 [==============================] - 27s 710ms/step - loss: 0.0575 - accuracy: 0.9792 - val_loss: 2.4634 - val_accuracy: 0.5646
Epoch 200/200
38/38 [==============================] - 28s 726ms/step - loss: 0.0907 - accuracy: 0.9700 - val_loss: 2.3338 - val_accuracy: 0.5875
Model: "sequential"
```

History / Accuracy



Predicting an image

Probability for Angry:

- 79.83%

Probability for Happy:

- 0.22%

Probabiliy for Neutral:

- 19.94%

Second Prediction

Probability for Angry:

- 33.34%

Probability for Happy:

- 33.35%

Probabiliy for Neutral:

- 33.31%

The End

Q&A