Recognizing Human Facial Expressions

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Overview:

- Business Case
- Exploratory Data Analysis
- Modeling
- Further Studies

Business case:

- CNN to detect facial expressions
- CNN in the medical field
- Emotions detecting glasses for children with autism
- Proof of concept - using CNN of scans x-rays

EDA:

- Kaggel data
- Labeled data
  - Training 80%
  - Test 10%
  - Validation 10%
- Classes:
  - (0- Angry,1- Disgust, 2 - Fear, 3 - Happy, 4 - Sad, 5 - Surprise, 6 - Neutral)
- Data type: PNG Image format

Labeled data:

Angry

Disgust

Fear

Happy

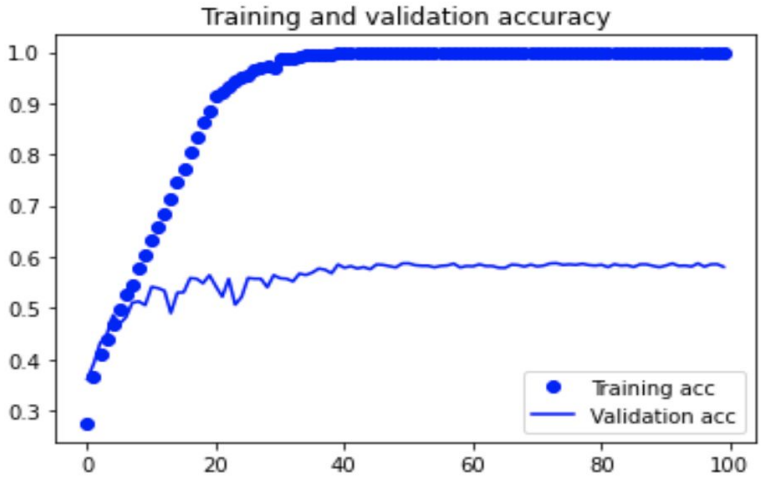
Sad

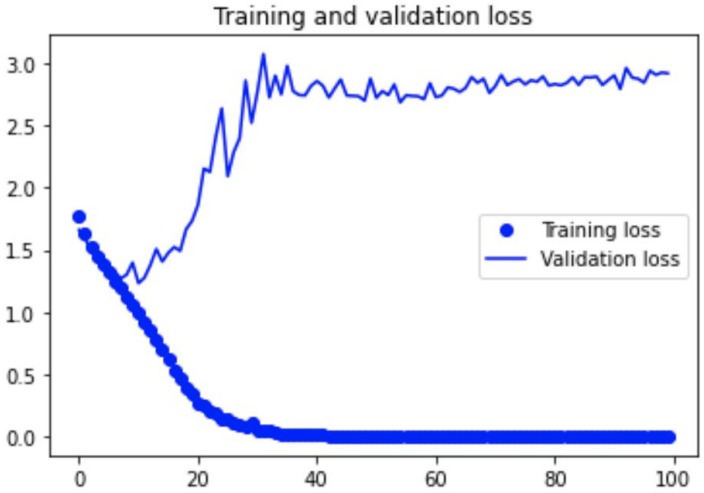
Surprise

Neutral

Modeling:

- Baseline Model:



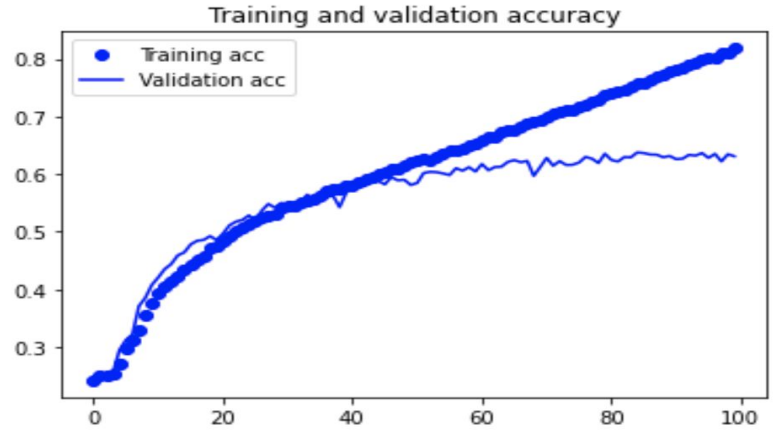


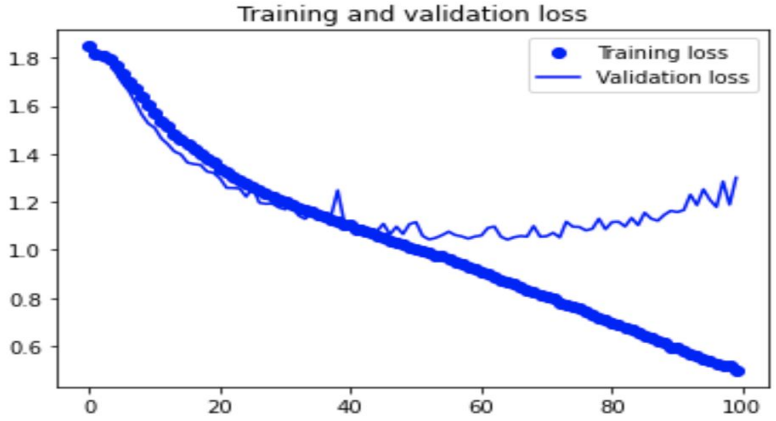
- Acc = 99% Vs. ValAcc = 58%
- Loss = 0.005 Vs. ValLoss = 2.919

- Drop Out

20%

Acc = 81% - 63%
Loss= 0.49 - 1.30

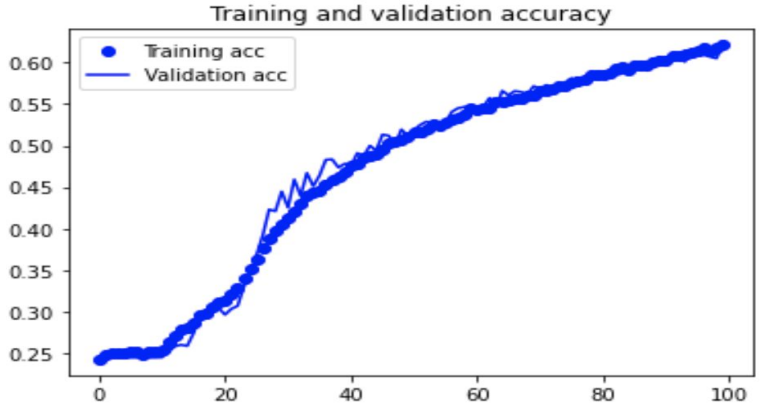


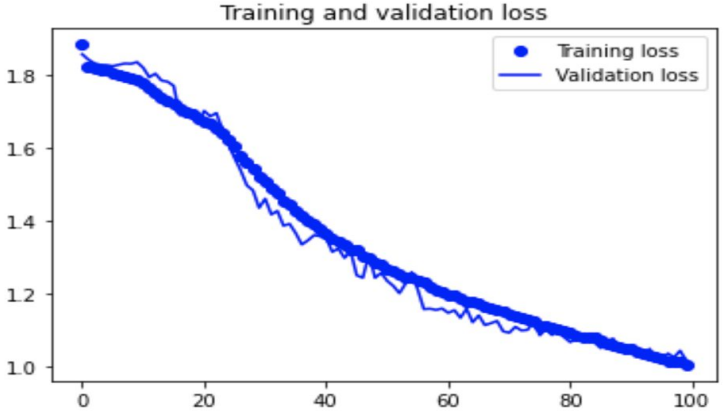


Vs.

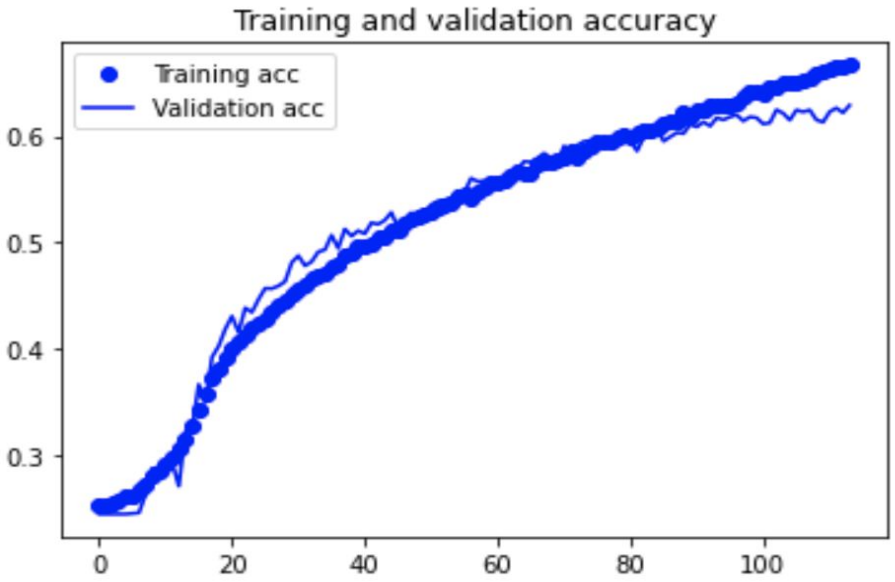
30%

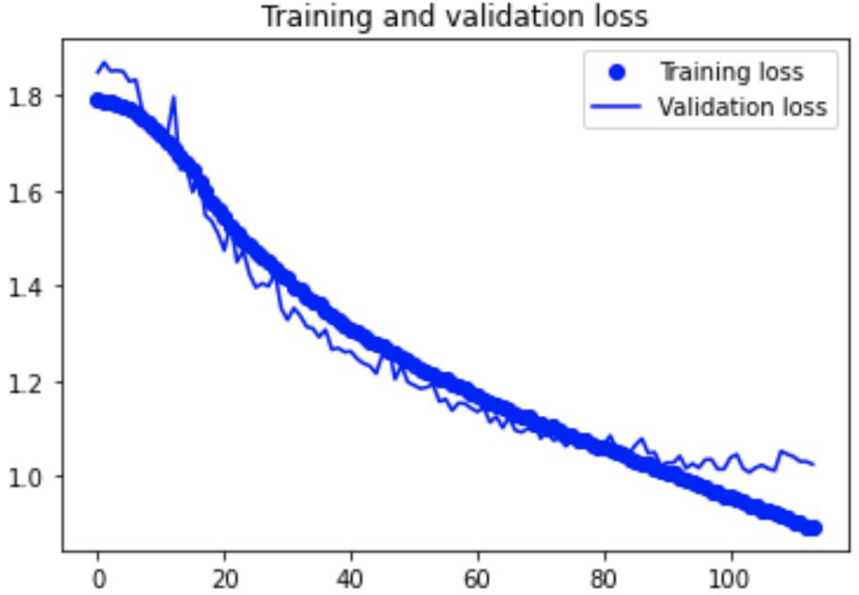
Acc = 62% - 62%
Loss= 1.00 - 1.01





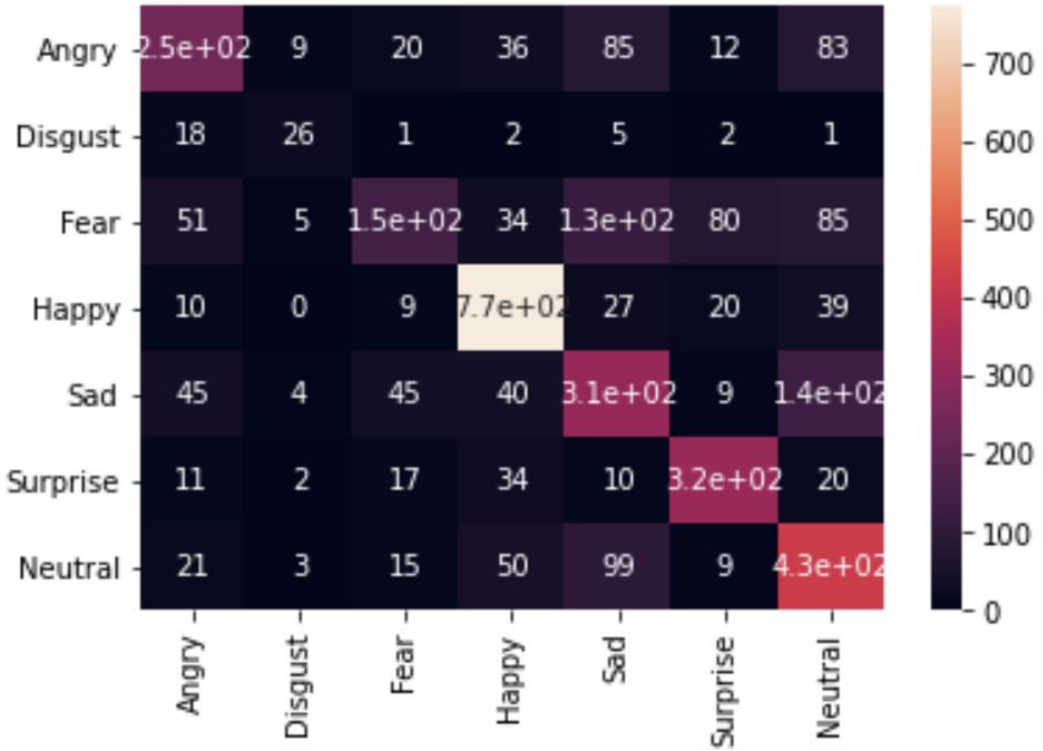
Final Model





- Acc = 66% Vs. ValAcc = 62%
- Loss = 0.89 Vs. ValLoss = 1.02

Confusion Matrix



Errors:

- The model was not recognizing (Disgust)
- Confusing “sad” with (Netural, Fear, Angry)
- Confusing “Neutral” with (Sad, Fear, Angry).

Ways to Improve Model:

- Experiment with different model structures
- Experiment with regulation techniques that did well, such as Drop out
- Exploring other regularization techniques such as Batch Normalization, Transfer learning and Pixel scaling

Thank You