Facial Emotion Recognition

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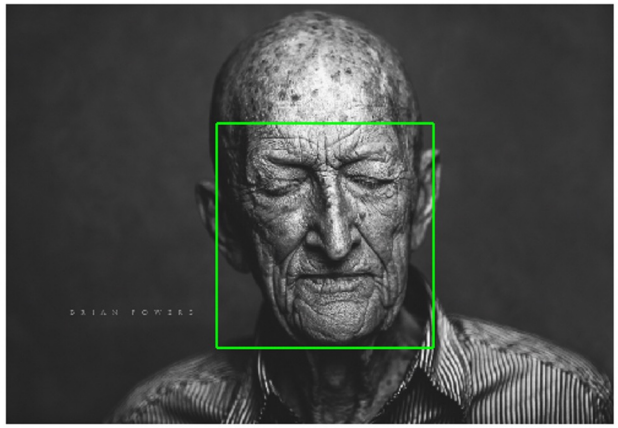
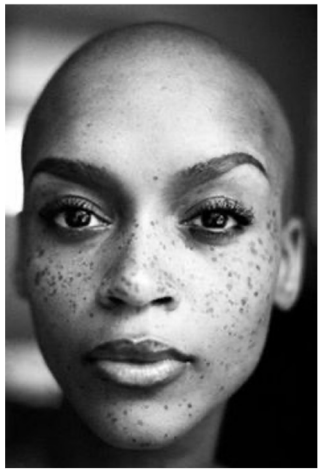
Outline

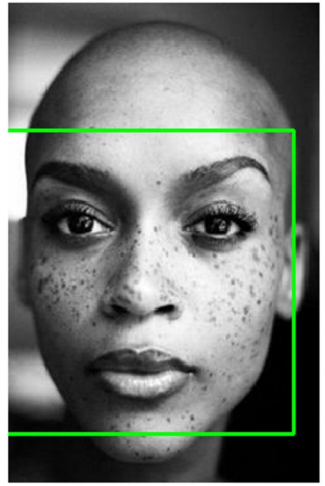
- Problem Statement and Feature extraction
- How to identify emotions
- Machine Learning approaches
- Deep learning approaches and pitfalls

Detecting The Face-

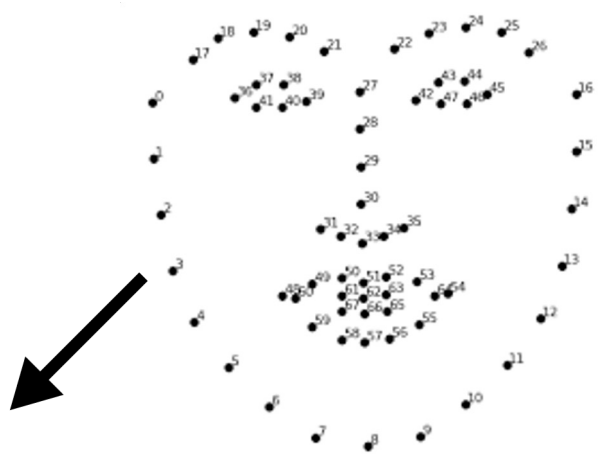

BRIAN POWERS


BRIAN POWERS





Key Landmarks-

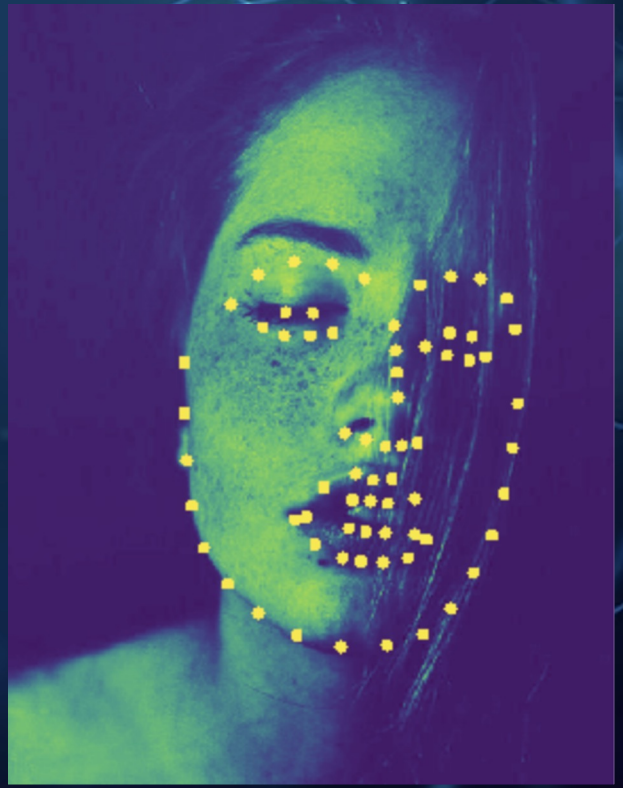


Identifying Emotions

Euclidean Distance: the distance between two points

Measured Distances

- Top of the eye to bottom of the eye
- Distance between eyebrow and top of the eyes
- Distance between edges of the mouth



Machine Learning approach and its accuracy

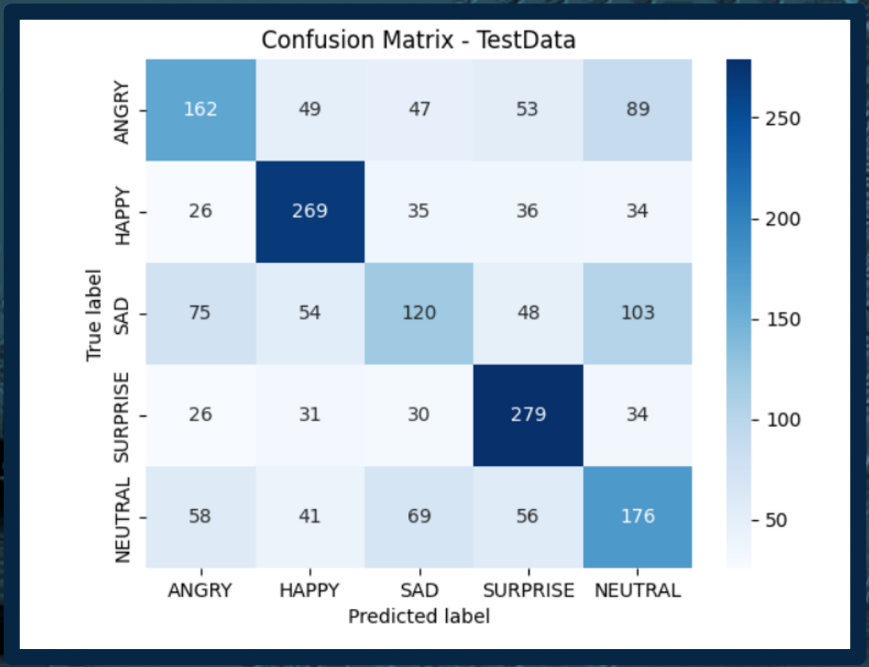
- In order to make it computationally cheaper we have performed PCA (Principal Component Analysis) on the data
  - Technique used to emphasize variation and bring out strong patterns in a dataset
- Main goal is to predict outputs from inputs with different classification techniques

Accuracies of different models:

- KNeighborsClassifier - 46.8%
- LogisticRegression - 42.7%
- DecisionTreeClassifier - 50.3%

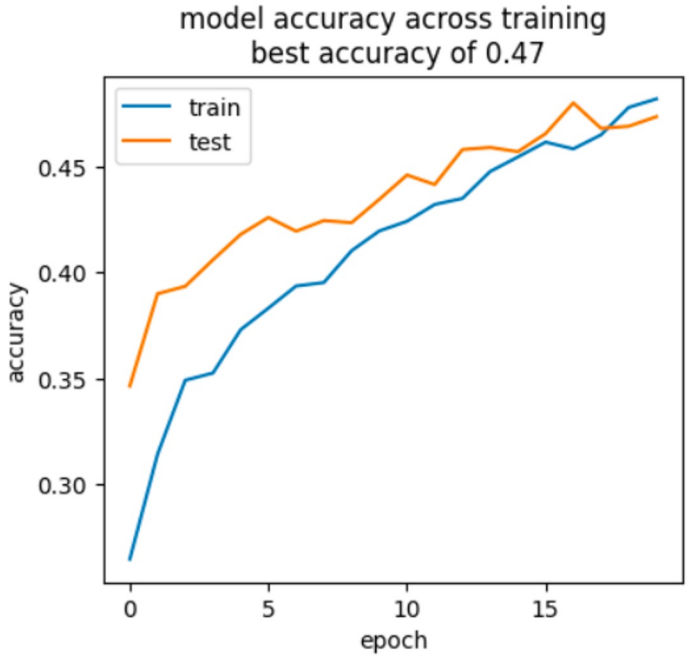
Confusion Matrix

- A confusion matrix is a table used to test the performance of a classification model through the comparison between predicted and real class values

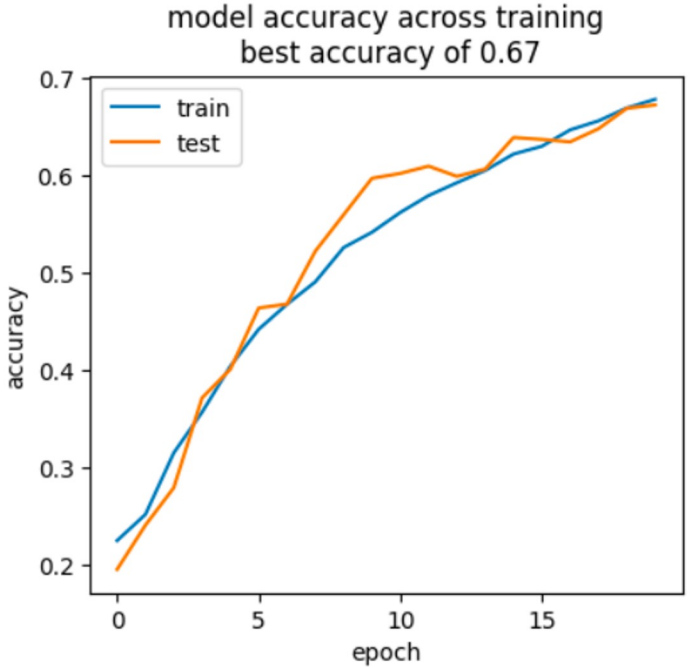


162 angry people being properly identified
34 people predicted as neutral, but are happy

DL Approaches



Accuracy curve of MLP



Accuracy curve of CNN

Overfitting's Cause and Effects

Cause:

- Small training data set
- Not enough variety of data
- Can't represent all the possible data inputs.

Fix:

- More training data
- Add more noise
- More variety of data

Effects:

- Inaccurate predictions
- Can't generalize well to new data.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