Machine Learning Final Project Presentation

Project Topic:

Emoji Generation Through Facial Emotion and Text Sentiment Analysis

Introduction

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Overview

- Facial Emotion Detection
- Text Sentiment Analysis
- Match Facial Emotion and Text Sentiment
- Generation of Emoji based on the matching results

Dataset Analysis

- Facial Emotion Detection
  - Represents Seven Individual Emotions
    - Angry
    - Fear
    - Happy
    - Neutral
    - Sad
    - Surprised
    - Disgust
- Text Sentiment Detection
  - Represents Five Individual Emotions
    - Angry
    - Fear
    - Happy
    - Neutral
    - Sad

Model Analysis

Facial Emotion Detection

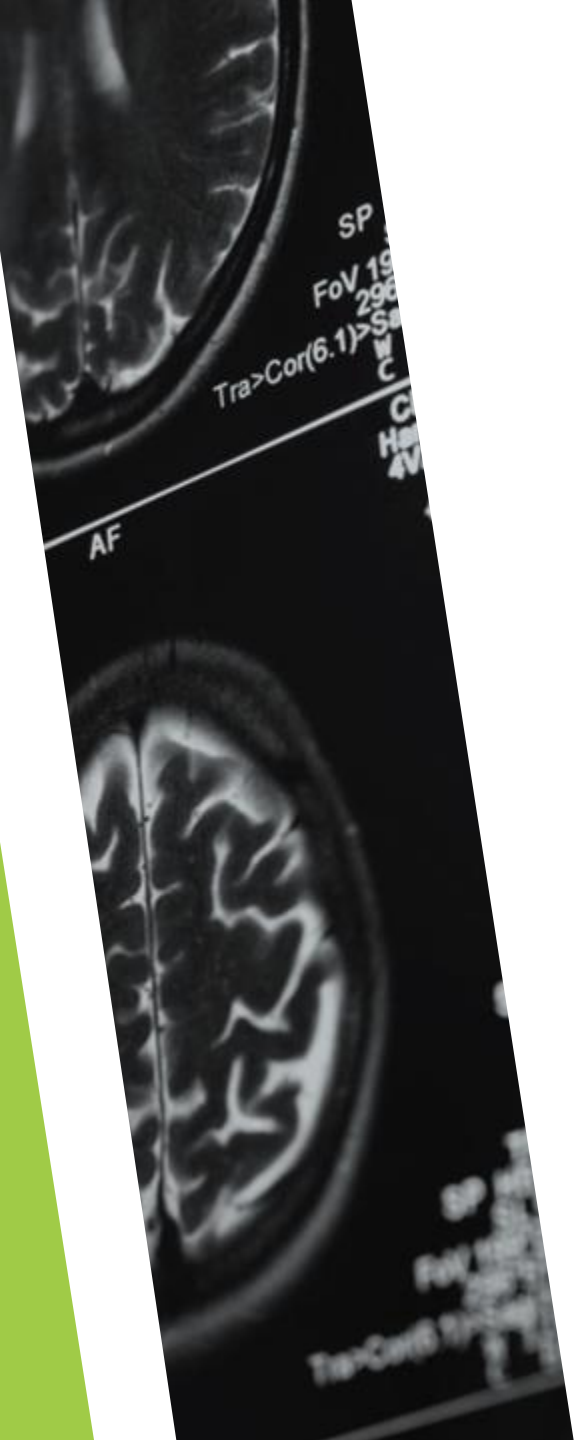
Convolutional Neural Network(CNN)

Text Sentiment Detection

Recurrent Neural Network(RNN)
Bi-directional Long Short Time Memory(BiLSTM)

Contribution

Facial Emotion Detection:	K.M.Tahlil Mahfuz Faruk(200042158)
Text Sentiment Detection:	Dayan Ahmed Khan(200042105)
Emoji Generation:	Shadman Sakib Shoumik (200042144)

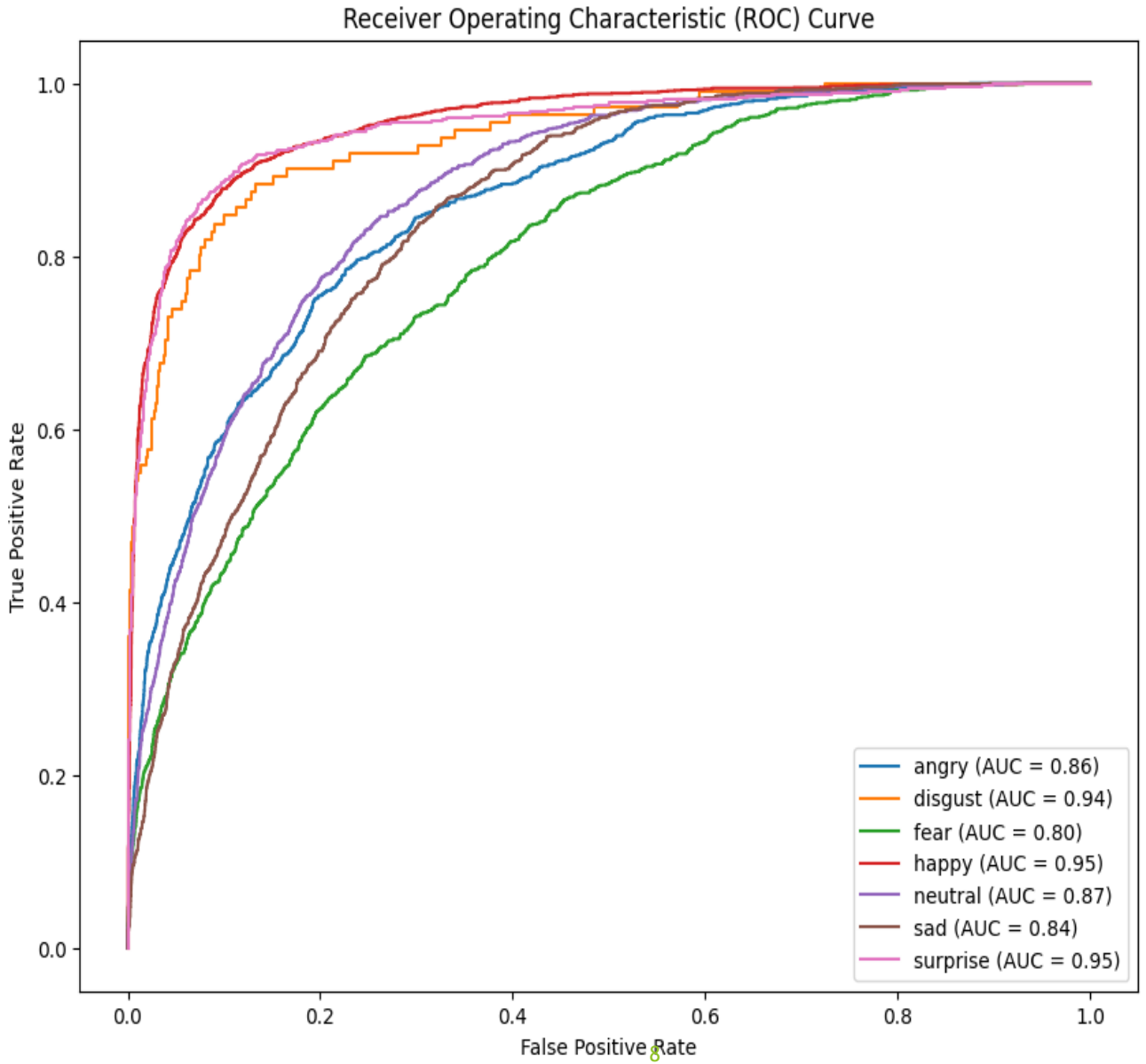


Facial Emotion Detection(CNN Model)

- Architecture: Convolutional Neural Network(CNN)
- Data Preprocessing: Resized to 48x48 pixels
- Epoch: 100 (44 performed)
- Batch Size: 128
- Kernel Size: 3x3
- Pooling: Max Pooling with pool size 2x2
- Dropout Rate
  - Helps with regularization
  - Convolutional Layer : 0.4
  - Dense Layer: 0.3
- Optimizer: Adam(Adaptive Learning Rate)
- Activation Functions: ReLU and Softmax

Facial Emotion Detection Model

ROC And AUC Analysis

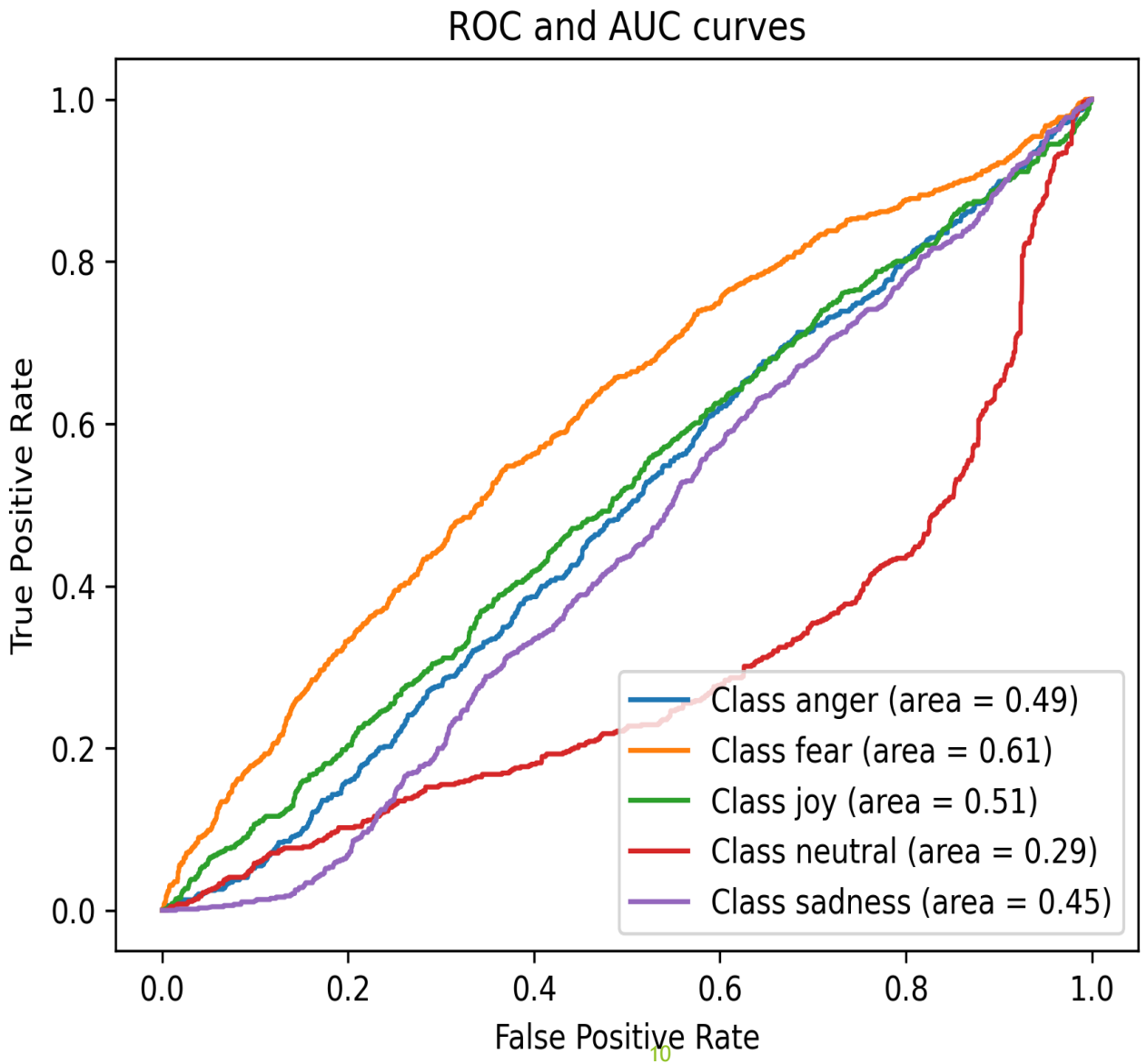


Text Sentiment Detection(RNN Model)

- Architecture: Bi-directional Long Short Time Memory
- Data Preprocessing: Tokenized and padded to a maximum sequence length of 500 words
- Epochs: 15
- Batch Size: 128
- Embedding Dimensions: 300
- Kernel Size: Not applicable (as it's a recurrent model, not convolutional)
- Pooling: Not applicable (as it's a recurrent model, not convolutional)
- Dropout Rate
- Helps with regularization
- GRU Layer: 0.2 (for both recurrent and dropout)
- Dense Layer: Not applicable (as the output layer is Dense with Softmax activation)
- Optimizer: Adam(Adaptive learning rate)
- Activation Functions: ReLU (in hidden layers) and Softmax (in the output layer)

Text Sentiment Analysis

ROC and AUC Analysis



Emoji Generation

- Open webcam and textbox to take inputs to the corresponding models
- Predict Facial Emotion
- Predict Text Sentiment
- Match Facial Emotion and Text Sentiment
  - If matched, Generates corresponding emotion emoji
  - Not matched, Generates confused emoji
  - Confused emojis are pre-defined by programmer

Project Demonstration

Thank You

Feel Free to ask any questions