Emotion Detection

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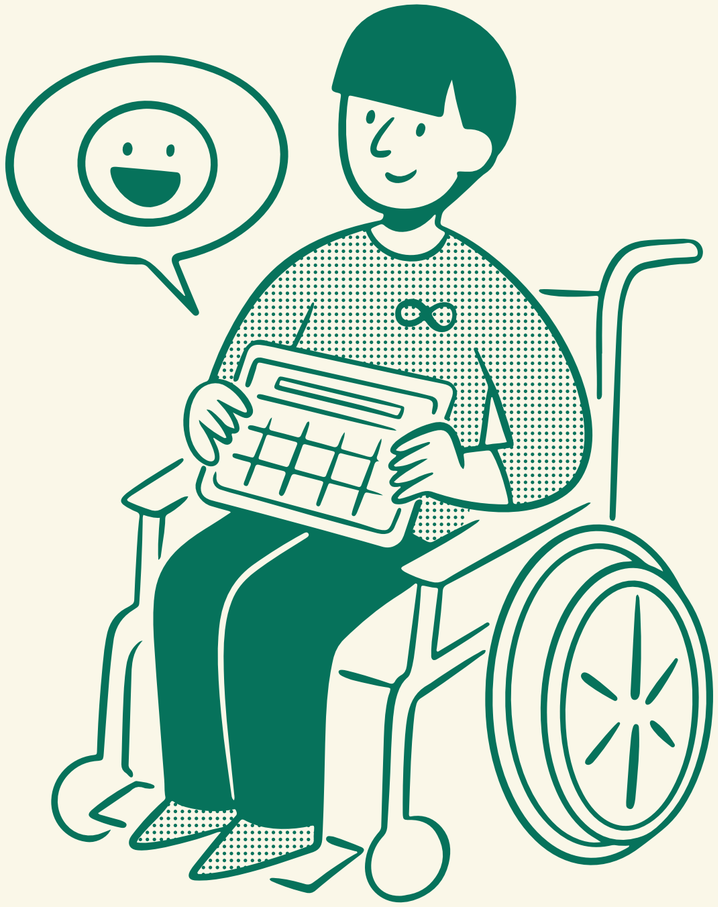
Problem Statement

Conventional methods for detecting emotions often suffer from inaccuracies and limited scalability. This project seeks to overcome these limitations by leveraging deep learning techniques to develop robust emotion recognition systems. We delve into different patterns from diverse data sources and we aim to create automated systems capable of accurately understanding and responding to human emotions. This endeavor holds promise for advancing fields like sentiment analysis and human-computer interaction.



01 - Approach

- Collecting datasets then data cleaning
- Building CNN models
- Data training and testing
- Save the model and Plotting confusion matrix.
- Deployment.

02 - Data Collection & Preprocessing

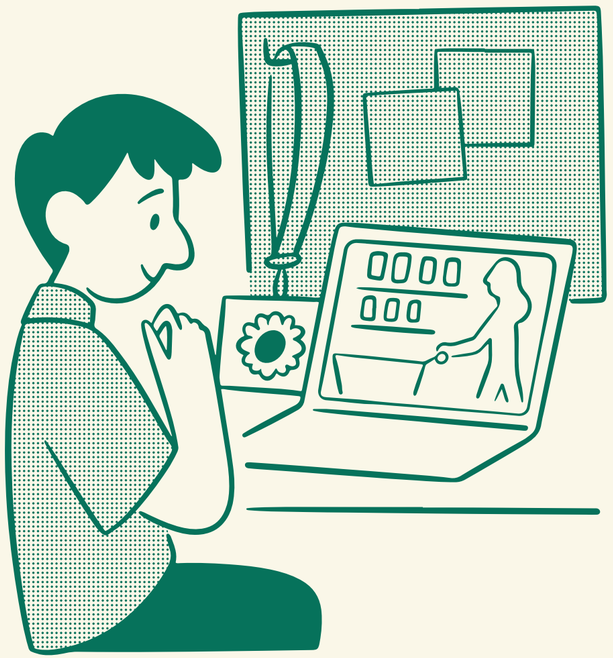
- The project utilizes FER2013 dataset, obtained from Kaggle [Mood Dataset]. This dataset offers a diverse collection of facial expressions categorized into four primary emotions: Happy, Angry, Sad, Neutral, Fear, Surprised and Disgust.
- To ensure model accuracy in real-world scenarios, the data undergoes a pre-processing stage, where images under go reshaping according to pixel values.
- Also using dictionary numerical labels are mapped to corresponding emotions. This is a common approach used in machine learning particularly in sentiment analysis or emotion recognition tasks. Each numerical label corresponds to a specific emotion.

03 -Training Models

Now, we come to the critical part, where we define our CNN architecture which utilizes convolutional and pooling layers to learn significant features from the facial expressions, an input 2D Convolutional layer (with 32 filters) paired with an 2D MaxPooling layer,

We also used VGGNet and ResNet50 to check the accuracy.

- VGGNet typically uses 3x3 convolutional filters with a stride of 1 and padding to maintain the spatial dimensions.
- ResNet50 specifically refers to a ResNet model with 50 layers, consisting of multiple residual blocks.



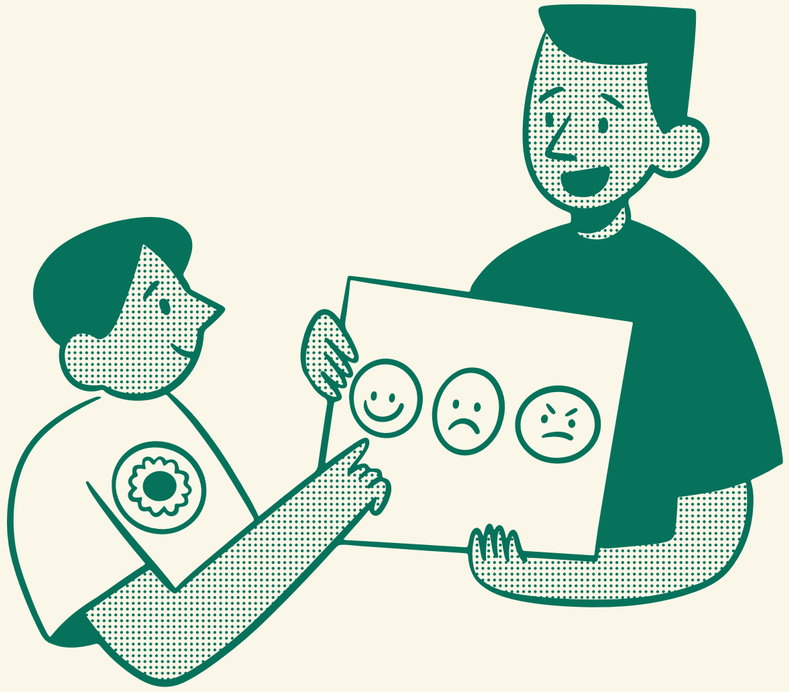
04 - Deployment

After training our deep learning model to accurately recognize emotions from various data sources, we're ready to bring it to life in real-world applications. Gradio provides a simple yet powerful platform for deploying machine learning models with intuitive interfaces. With Gradio, we can create a user-friendly interface that allows anyone to input text or upload images and instantly receive predictions about the emotions conveyed.

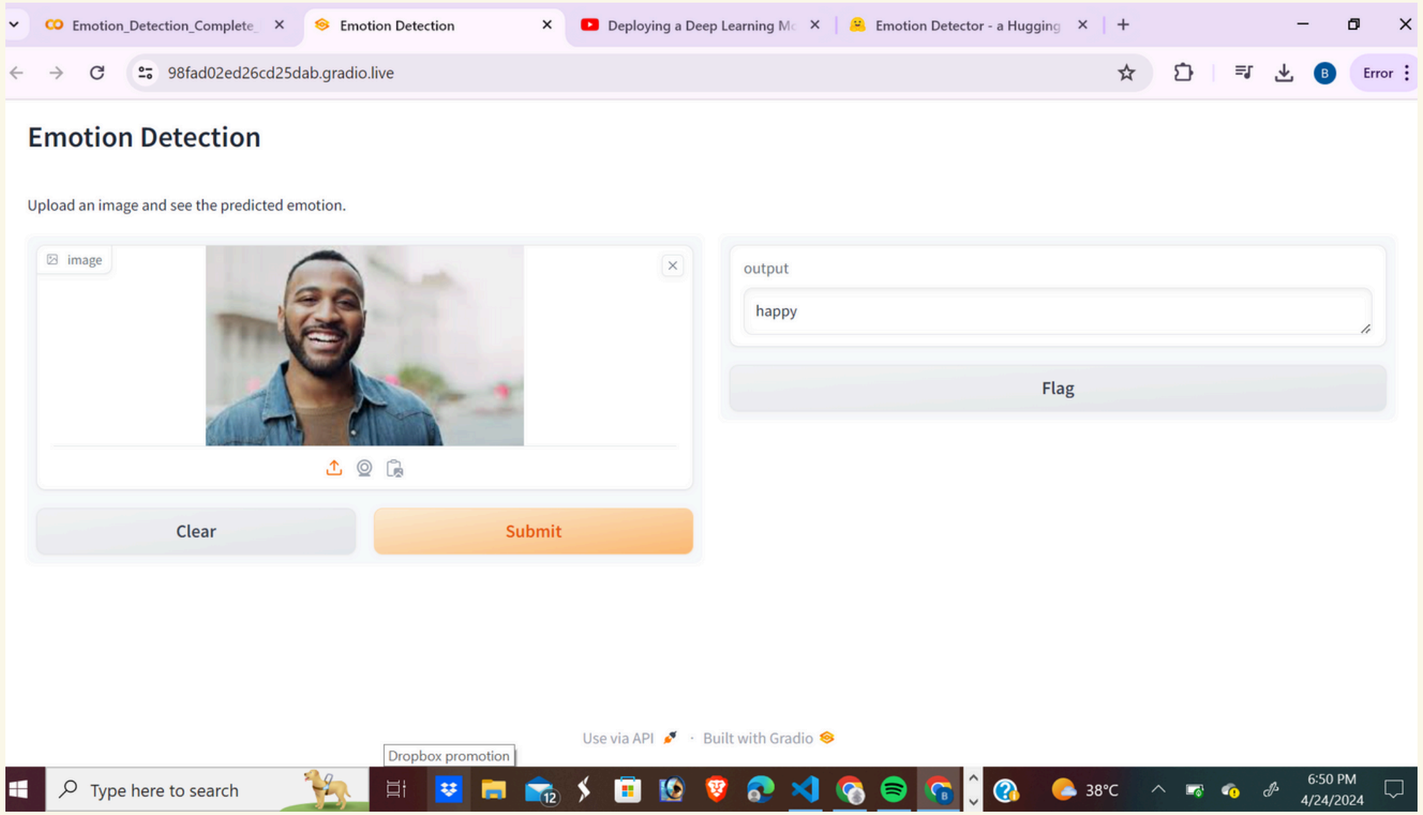
05 - How it works

“We encourage assertive communication”

- Face Detection: The system first identifies the presence of a face within the frame.
- Emotion Classification: Once a face is detected, a pre-trained CNN model takes over. The CNN architecture utilizes convolutional and pooling layers to automatically extract and learn significant features from the facial expressions. The model is specifically trained to distinguish between four primary emotions: Happy, Angry, Sad, and Calm.



06 - Output


Emotion_Detection_Complete
Emotion Detection
Deploying a Deep Learning M
Emotion Detector - a Hugging
98fad02ed26cd25dab.gradio.live
Error
Emotion Detection
Upload an image and see the predicted emotion.
image
output
happy
Flag
Clear
Submit
Use via API
Built with Gradio
Dropbox promotion
Type here to search
38°C
6:50 PM
4/24/2024

Thanks

Emotions makes
Humans