

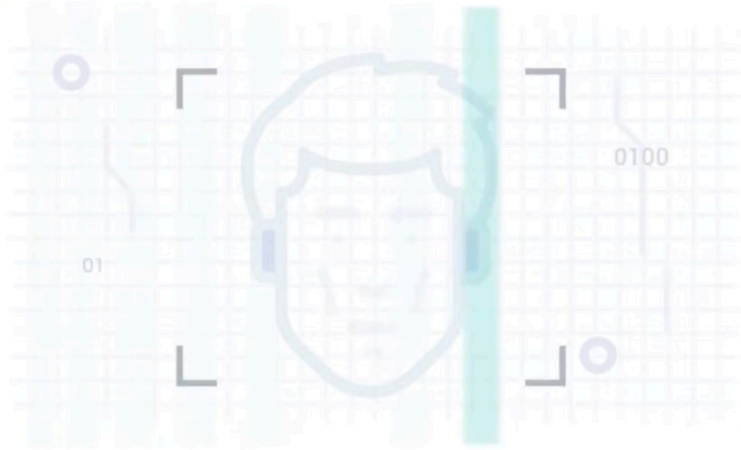
Emotion Recognition using Deep Learning

Web Application Development

By: Eli Daniels

Our objective is - to predict emotion for face images

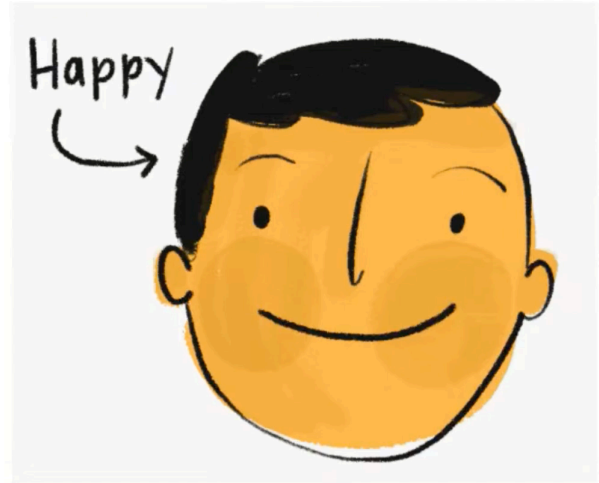
Input Image



Emotion
Detection
Model



Output



The Datasets:

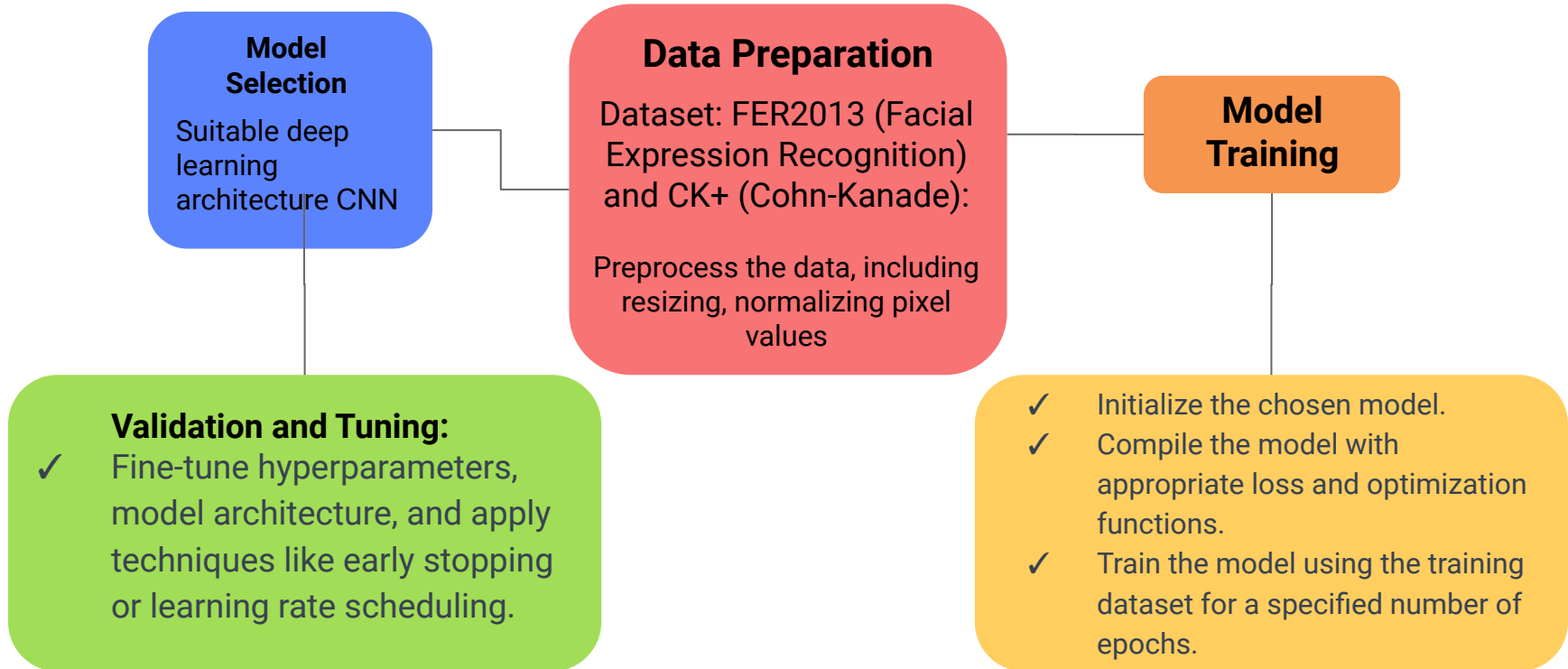
FER2013 (Facial Expression Recognition 2013):

- FER2013 is one of the most widely used datasets for emotion recognition. It contains over 35,000 grayscale images of faces categorized into seven different emotions: anger, disgust, fear, happiness, sadness, surprise, and neutral.
- This dataset is a good starting point for research and experimentation due to its size and availability.

CK+ (Cohn-Kanade):

- CK+ is a dataset specifically designed for facial expression analysis. It includes over 500 image sequences of subjects displaying various facial expressions. It's often used for more detailed studies.

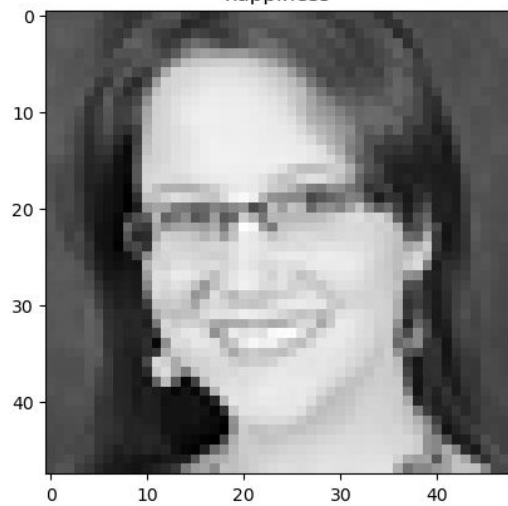
The Process:



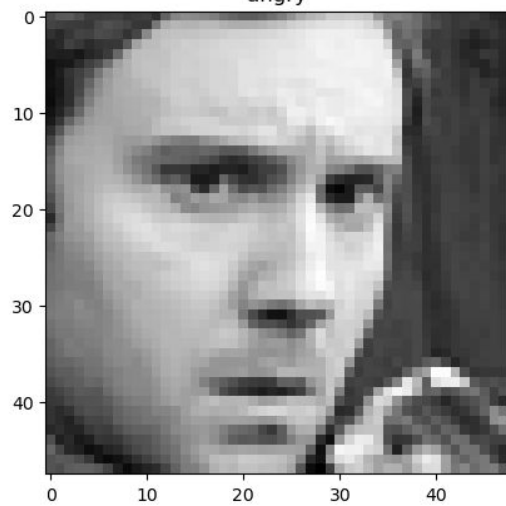
**A PICTURE
IS WORTH A
THOUSAND
WORDS**



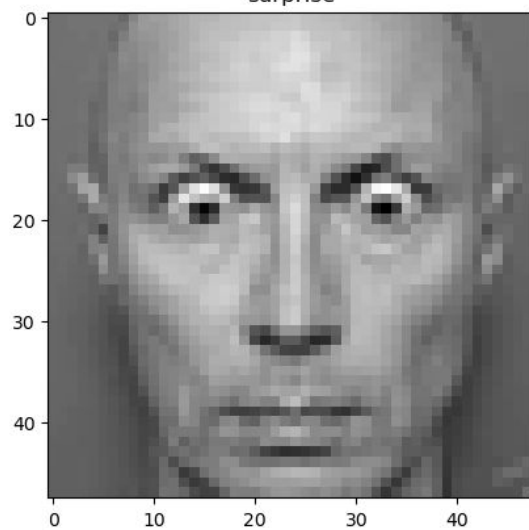
happiness



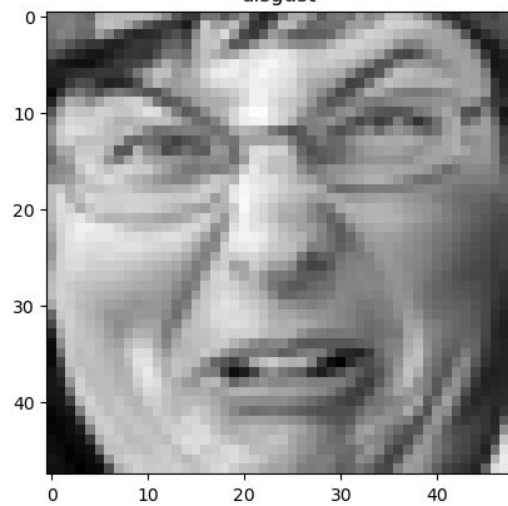
angry



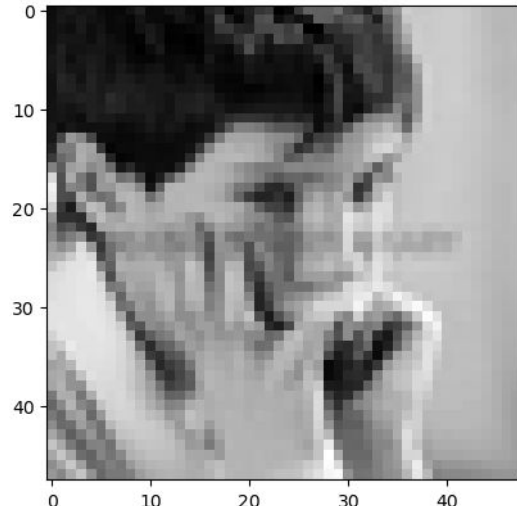
surprise



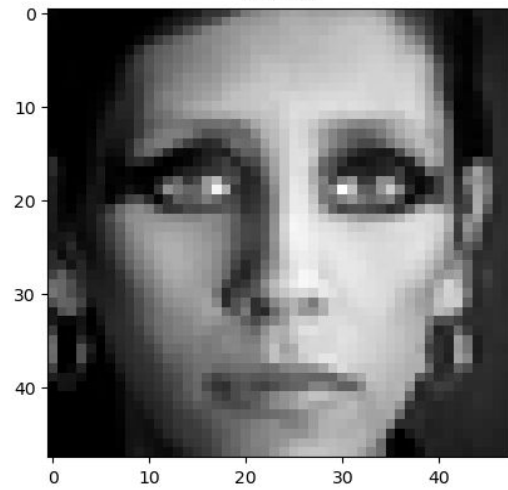
disgust



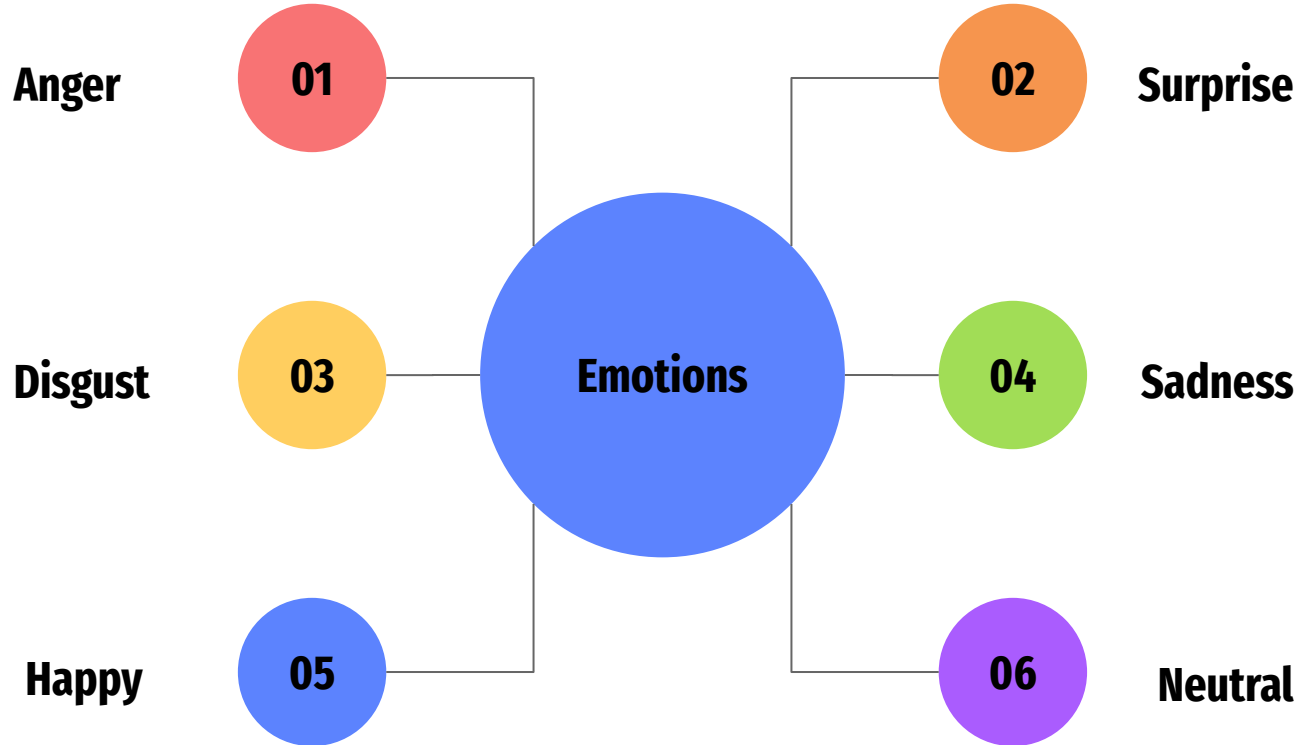
sad



neutral



Emotional Breakdown



Emotional Intelligence Infographics



58 %

FER2013 dataset

With Convolutional
layers: Flatten, Dense
etc.

84 %

CK+ dataset

layers.Conv2D
MaxPooling2D
Flatten, Dense

55 %

FER2013 dataset

val_accuracy:
0.5341

Algorithm: CK+ dataset, CNN, optimizer='adam', activation='softmax'

Quick Dive Into Metrics

Loss (Training vs. Validation):

- Training Loss: 0.5304
- Validation Loss: 0.5220

Accuracy (Training vs. Validation):

- Training Accuracy: 0.8418 (84.18%)
- Validation Accuracy: 0.8311 (83.11%)

Overall Analysis

- The model's performance appears to be quite good.
- It has learned from the training data and is generalizing well to the validation data.
- The small difference between training and validation metrics indicates that the model is not suffering from significant overfitting or underfitting.

Demonstration



**Emotion Recognition
Model**



Emotion Scores:

angry: 0.005386296194046736

disgust: 0.013322117738425732

fear: 0.11439087241888046

happy: 0.258876234292984

sad: 0.010991943068802357

surprise: 0.15653066337108612

neutral: 0.35665422677993774

dominant emotion: It Depends

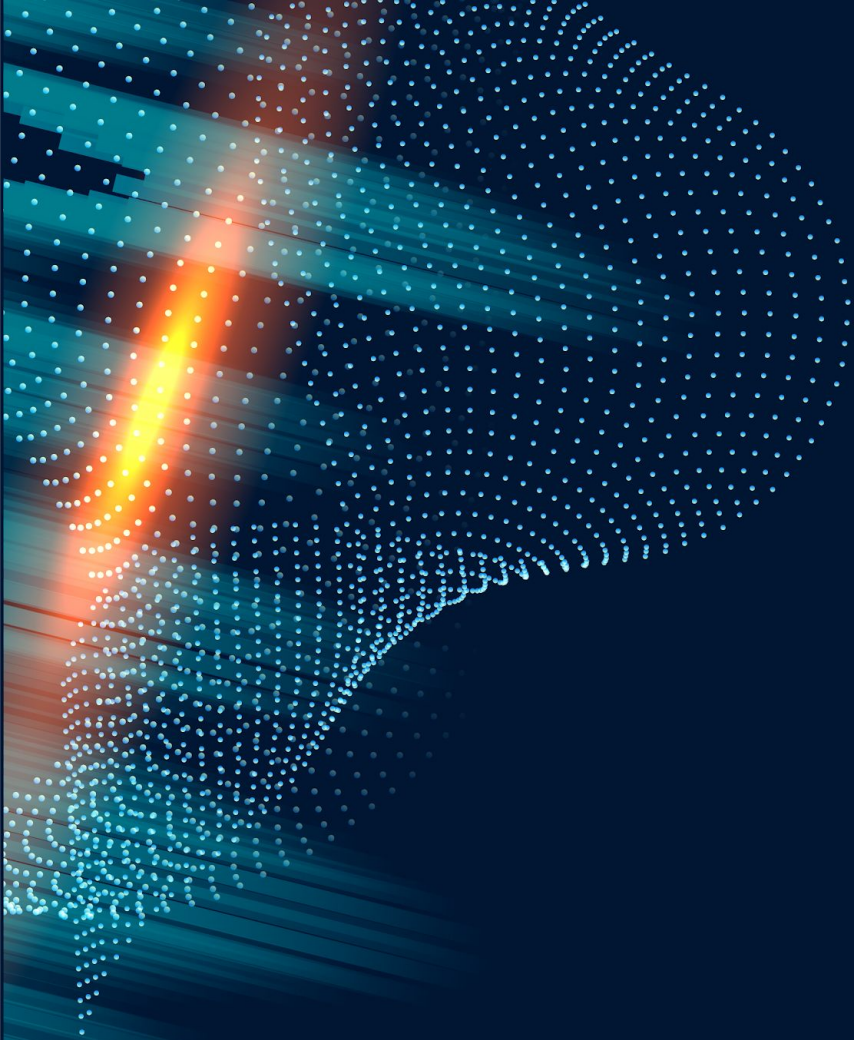
Real World Application!



1. **Virtual Meetings:**
 - a. **Emotion Analysis in Virtual Meetings:** During virtual meetings, the program can help analyze participants' emotions in real-time. This information can be valuable for gauging engagement and adjusting the meeting's content accordingly.
 - b. **Face Detection for Participant Highlighting:** You can use face detection to highlight the active speaker's face or participants' faces, improving the visual experience for attendees.
2. **Education:**
 - a. **Student Engagement:** In online education, gauge students' engagement and understanding by analyzing their facial expressions.
 - b. **Attention Tracking:** Monitor student attentiveness during virtual classes or lectures.
3. **Healthcare:**
 - a. **Remote Patient Monitoring:** In telehealth, analyze patients' emotions and vital signs for remote diagnosis and treatment
4. **Market Research:**
 - a. **Consumer Sentiment Analysis:** Analyze facial expressions in focus groups or product testing to gauge consumer sentiment toward products or advertisements.
5. **Gaming:**
 - **Game Interaction:** Create games that adapt based on the player's emotions, making the gaming experience more immersive

Pie Chart





**THANK
YOU!**