

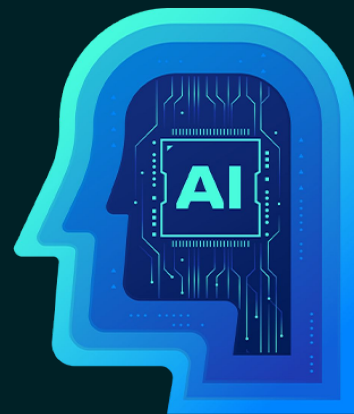


164 Project Emotion Detection

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Goals

- Form an AI model capable of detecting facial emotion
- Use that model to predict live emotion
- Use CNN to implement an AI model capable of accurate prediction



High Level Design Of Solution

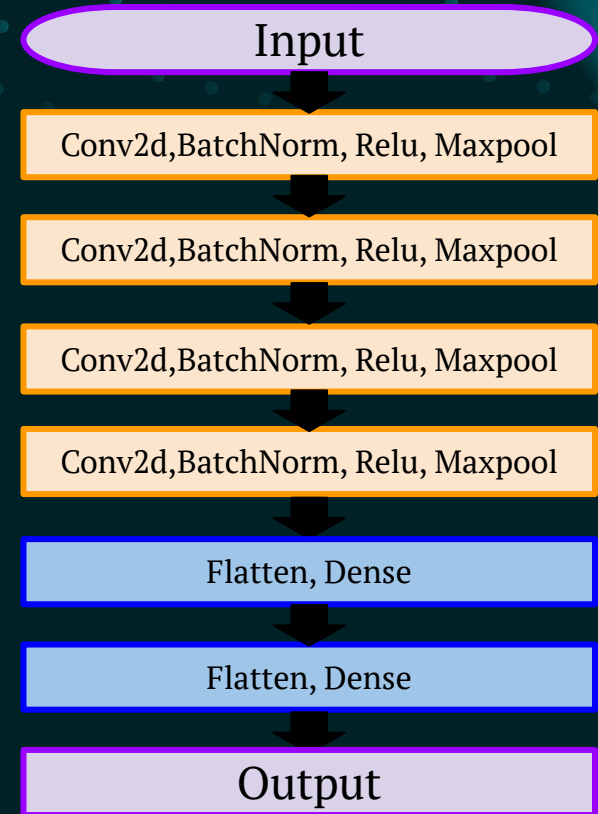
Data Preparation: resizing and greyscale

Data Augmentation: rotation, zoom, shift..

Model Design: 4 layers, 2 interconnection layers, and input and output

Training: 40 epochs for training and checkpointing to save current best model

Evaluation: model's performance in accuracy and loss



Tools and Algorithms Used

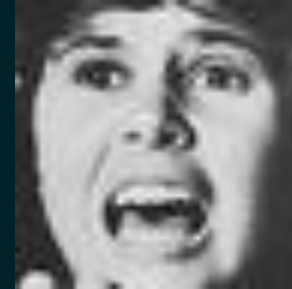
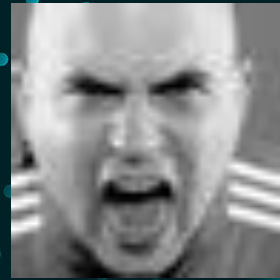
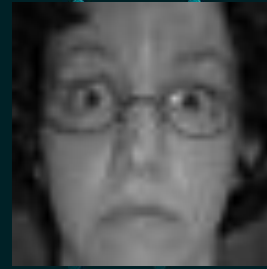
- Tools:
 - TensorFlow and Keras
 - NumPy
 - Matplotlib
 - Operating System (OS) Module
- Algorithms:
 - Convolutional Neural Networks (CNNs)
 - Batch Normalization
 - Dropout



Data Set

Face expression recognition dataset

- Kaggle
- 7 Emotion categories
 - Angry
 - Disgust
 - Fear
 - Happy
 - Neutral
 - Sad
 - Surprise



Live Demo



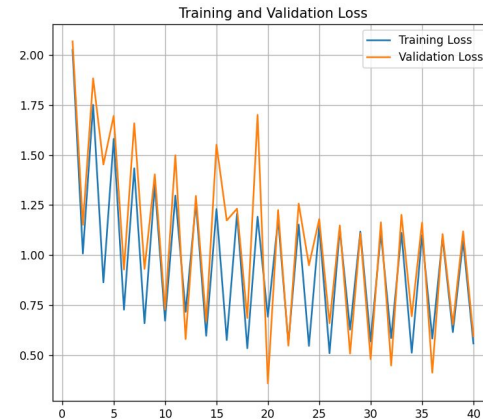
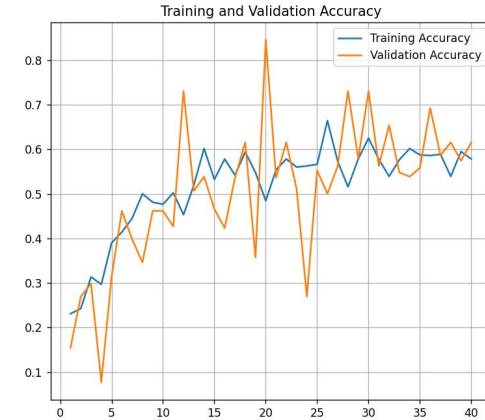
Results

Results From Model

- Total params: 4,478,727
- Trainable params: 4,474,759
- Non-trainable params: 3,968
- Approx 60 % accuracy for model

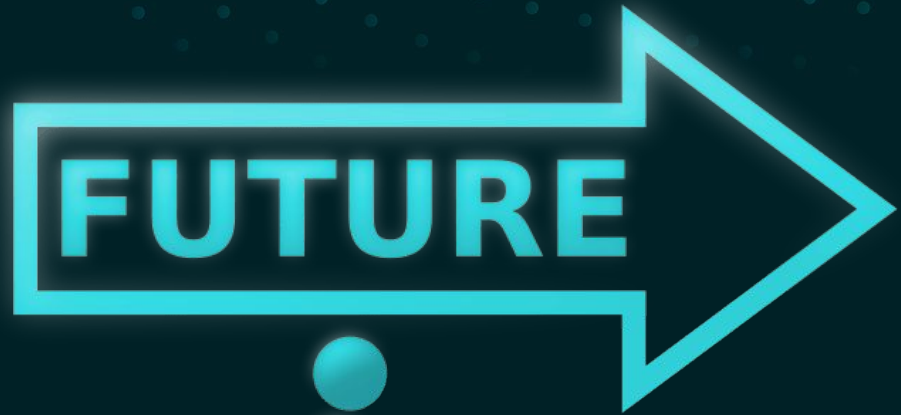
Results From Live Testing

- Requires over exaggerating of emotions
- Disgust and Fear worst performing



Ideas For Future Work

- Expand/Rework data set to build a more robust and accurate model
- Freeze model set and add a way to train on facial recognition, like in Nvidia project
- Expanding to a multi-model approach to account for other modalities like tone, body language, and others to form a consensus on emotion recognition



Work Cited

Face Expression Recognition Dataset.

<https://www.kaggle.com/datasets/jonathanoheix/face-expression-recognition-dataset>. Accessed 24 Apr. 2024.

“NVIDIA Deep Learning Institute and Training Solutions.” NVIDIA,

<https://www.nvidia.com/en-us/training/>. Accessed 24 Apr. 2024.