Project Report: Face Expression Recognition

Introduction

This project aims to develop a deep learning model to classify facial expressions using the Face Expression Recognition Dataset. The model identifies emotions from images, providing applications in various fields such as psychology, security, and human-computer interaction.

Dataset

The dataset used for this project is the Face Expression Recognition Dataset by Jonathan Oheix. It consists of grayscale images of faces, categorized into different emotional expressions. The main classes in the dataset include:

Anger

Disgust

Fear

Happiness

Sadness

Surprise

Neutral

Data Structure

The dataset is divided into:

**Training Set:** Used to train the model.

**Validation Set**: Used to validate the model's performance during training.

**Test Set**: Used to evaluate the final model's performance.

Methodology

**Data Preprocessing**:

Images were resized to 48x48 pixels.

Converted to grayscale for uniformity and to match the training data.

Images were normalized to scale pixel values between 0 and 1.

**Model Architecture:**

A Convolutional Neural Network (CNN) was designed to classify the facial expressions.

The architecture included convolutional layers, pooling layers, and dense layers to extract features and make predictions.

**Training the Model:**

The model was trained using the training set.

Hyperparameters such as batch size, epochs, and learning rate were tuned for optimal performance.

Early stopping and model checkpointing techniques were employed to avoid overfitting.

**Prediction and Evaluation**:

The trained model was evaluated using the validation and test sets.

Predictions were made on new images, displaying the classified emotion alongside the image.

Results

The model achieved a validation accuracy of approximately XX% (replace with actual accuracy).

Sample predictions were made on images, demonstrating the model's capability to recognize different facial expressions.

Conclusion

The project successfully demonstrated the feasibility of using deep learning for facial expression recognition. Future improvements could involve experimenting with more complex architectures or utilizing transfer learning to enhance accuracy.



**Orignal :Happy**

**Predicted : Happy**



**Orignal : Sad**

**Pedicted : Sad**



**Orignal : Fear**

**Predicted : Fear**



**Orignal : Angry**

**Predicted : Angry**



**Orignal : Disgust**

**Predicted : Disgust**



**Orignal : Neutral**

**Predicted : Neutral**

References

Face Expression Recognition Dataset: <https://www.kaggle.com/datasets/jonathanoheix/face-expression-recognition-dataset>