Classifying Facial Expressions

This project uses data retrieved from Kaggle titled *FER-2013* (https://www.kaggle.com/datasets/msambare/fer2013). It includes thousands of different images of facial expressions categorized into seven different emotions: angry, disgust, fear, happy, neutral, sad, and surprise. The data were already separated into training and testing sets, and multiple Convolutional Neural Networks (CNNs) were performed on the data to see which was most accurate at classifying the different facial expressions.

Project Features

This project uses several different CNNs to classify the images of facial expressions. It will run through building the CNN models individually, specifying to include certain parameters with different models. It will also display the classification report and confusion matrix of the best-performing model at the end of the notebook.

Installations and Requirements

This project will require the following Python libraries to be imported in order to run the models, evaluate the model performance, and plot the model performance:

- tensorflow
- tensorflow.keras.preprocessing.image: ImageDataGenerator
- tensorflow.keras.models: Sequential
- tensorflow.keras.layers: Conv2D, MaxPooling2D, Flatten, Dense, Dropout, BatchNormalization
- tensorflow.keras.optimizers.legacy: Adam
- numpy
- sklearn.metrics: classification_report, confusion_matrix
- seaborn
- matplotlib.pyplot

Using the Project

You can use this project in either Jupyter Notebook or any other Python IDE, such as PyCharm. This system could also be run in a Python terminal. However, it is recommended to be used in an IDE, as that is where the script was created and run before. If you wish to use it in Jupyter Notebook, download the .ipynb file for use in your own Jupyter Notebook or copy each cell into your Jupyter Notebook. You may also copy and paste the code into another Python IDE if you prefer a different IDE besides Jupyter Notebook.

The script will load the data, prepare the models for analysis, and run multiple CNNs on the images to classify facial expressions based on the image data. Each model's metrics can be compared by using the accuracy and loss scores to determine the best model for predicting life satisfaction scores.

Contact

For any questions or concerns, please feel free to contact me, Ahria Dominguez, at
ahriadominguez@outlook.com.