Project Proposal

Project Title – Facial Emotion recognition project Using Neural Network in AZURE

Team Members:

1. Seeni Sri Mounish -11549237
2. Pavan kalyan -11588539
3. Anudeep Indla -11509912

Project Workflow:

The Project will be completed in several phases. Everyone on the team will be given work for each phase, based on the tasks that need to be finished within that particular week. At our weekly meeting every Saturday night, we go over it and evaluate the results of the work. Every person is instructed to demonstrate progress in their job at each stage, assuming that their co-workers are resolving any issues with the assigned assignment.

Motivation:

This project will let us work on some advanced Neural Network techniques

Objective:

The main objective of the project is to Detect the Facial Expression. In this application, we use Facial Emotion Recognition (FER) which examines facial expressions in both still photos and moving pictures to determine a person's emotional state. We use this for the Emotion Analysis of online student education

Features:

The data set which features different facial expression like Disgust, Fear, neutral, sad, surprise, Angry, happy.

References:

https://www.kaggle.com/datasets/jonathanoheix/face-expression-recognition-dataset

Repository:

<https://github.com/SuPeRiBOT/project_sdai>

Increment- 1

Until this increment we worked from data cleaning to the training of our model. Our dataset we have train and validation data which consists of universal features/expressions Fear, Neutral, Disgust, Sad, Surprise, Angry, Happy. This data set consists of 35887 images out of which 28,821 images in train data and 7066 in validation data. Initially we have done data gathering and data cleaning which is done by Anudeep Indla where we have neutral expression images in some of the other classes in train and validation data those files were removed in order to improve the model accuracy. After this we worked on choosing the model. As Normal ML models are hard to work on large quantity of image data we choose Neural Networks to implement.

From this, Implementation part was worked by Sri Mounish and Pavan Kumar. Here we start by importing all the required libraries like keras, Sequential, Conv2D, MaxPooling2D, etc. We are working this project on colab. Initially we declare the total number of classes, the image rows and columns and the number of images used for every iteration which is the batch size and we assign the batch size to 64 we are giving 64 even though we have 35000 images as a lower batch number leads to increase in accuracy even though it takes time. Now we assign the Training and Validation Data. Initially Images are automatically scaled into 255 pixels but to make sure we again scale the train and validation images and again we convert them to 1 – 255. Now the train and validation data are converted to greyscale and batches of 64 ad ready for the train. We used Sequential type Neural Network and we added different layers in this like conv2d, activation, batch\_normaliztion, etc. Now we declare the hyper Parameters like loss, optimizer used and metrics. In optimizer we took learning rate as 0.001 as it improves the accuracy. Now we fit the train and validation data and train the model, here we run 25 epochs. So as there are 450 batches, each batch consisting of 64 images each epoch is run 450 times and the accuracy of the model is increases on every epoch. We Got an accuracy of 89%.

We have completed until this part In the Next increment we are going to complete the validation accuracy and testing and we are going to deploy this code in the azure function app to be used by the end user.

Increment – 2

In this increment the model training got completed with an accuracy of 87%. We then saved the model in a H5 format and plotted the curve for epochs, accuracy and for epochs and loss. Here we can see the curve showed an increasing accuracy with the epochs and decreasing loss. We now tested weather the model is predicting the faces with the test samples. We then generated an emotion predictor by taking the model path and using haarcascade\_frontalface\_ default file using video frame capture from camera. There are a few errors arising like the camera is turning on to take a frame but then system goes Not Responding.

Git Hub Link : <https://github.com/SuPeRiBOT/project_sdai>