Emotions' recognition

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Abstract – This document presents the implementation and explanation of a CNN using sklearn, TensorFlow, OpenCV to determine the emotion of a person in front the camera.

I. INTRODUCTION

Now on days, emotional expressions are important for communication and mental health, but there are many people outside that are having trouble giving a wrong meaning because of their non-verbally messages are different form the verbally ones. Also, with the return of presential activities many people are struggling with their day, knowing how they are feeling can help everyone on having a great mental state.

II. DATASET

The dataset used to develop this project was obtained from Challenges in Representation Learning: A report on three machine learning contests[1]. This compilation of data collected is a collection of images' pixels about people with different facial expressions.

The are 7 different emotions on the dataset:

1. Anger
2. Disgust
3. Fear
4. Happiness
5. Sadness
6. Surprise
7. Neutral

Figure 1 Portion of the plotted dataset ta ken to do the project.

III. APPROACH

The purpose of this project is to determine the emotion a person has at the moment he/she is in front of the camera.

This classification training is performed by a regression algorithm to approximate the

relationship between the emotion and the image pixels.

To achieve the objective, the data from the pixels was needed to be suit according to the image dimensions and the available emotions. To do this selection, reshape the values was applied to the data to fit the 48 pixels of the image and saved on an array along with its emotion label (Figure 2). Once the data was prepared and stacked it is ready to be trained, then ready to be prepared to the TensorFlow model.

For the kernel the imagen is going to be divided into 3 layers, each kernel has a window dimension of 32, 64, 128.

Figure 2 Graphical correlation between data fields.

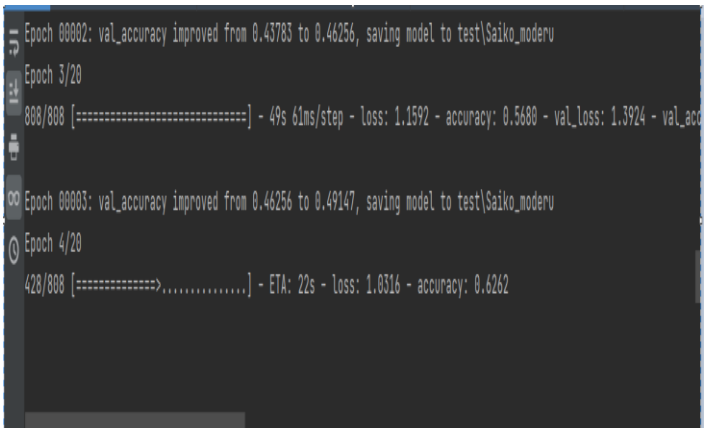
IV. REGRESION

To the develop the project the input data was divided in 20% for training and 80% for testing.

A regression was applied to train the classification model, using the sklearn linear model.

V. RESULTS

Once compiled the model it will be going through epochs to train the model increasing the accuracy. It works and now the model is ready to be implemented alongside OpenCV.



VI. CONCLUSION

Based on the results obtain the aim of the project was achieved. Despite of the training, during the facial recognition you need to have a very clear expression to have an accurate result.

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