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Facial Expression Recognition using Convolutional Neural Network and Emojis

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Abstract

Facial Expression Recognition is a technology that analyses facial expressions from still images and videos to reveal information about a person's emotional state. The complexity of facial expressions, the ability to use technology in any context, and the entry of new technologies such as artificial intelligence increase privacy risks significantly. At different times or times, the human face reflects one's feeling or mood. Humans have the ability to create thousands of facial actions during communication with varying degrees of complexity, intensity, and meaning. Expressions or intentions are often communicated through subtle changes in one or more distinct characteristics.

1. Introduction

We know that Expression plays an important role in one's life. At different times or times, the human face reflects one's feeling or mood. Humans have the ability to create thousands of facial actions during communication with varying degrees of complexity, intensity, and meaning. Expressions or intentions are often communicated through subtle changes in one or more distinct characteristics.

Adding or subtracting one or more facial actions can change interpretation. In addition, some facial expressions may have similar gross morphology but represent different meanings for different intensity of expression. Capture the complexity of facial expressions in nonverbal communication. We will use the haar layer for facial region detection (ROI), which will then be passed as input to a complex neural network that will classify the person's facial expression.

2. Literature Survey

We have surveyed the existing projects and finally thought of making necessary modifications for getting the latest edition.

An individual's emotions have a significant impact on their ability to learn. Because of their inability to regulate their emotions, kids with high-functioning autism (HFA) often have difficulty focusing and paying attention in class. Once unpleasant emotions have emerged in HFA children, attempts to regulate them are typically unsuccessful since they are difficult to quiet down. In an e-learning environment, students with High functioning autism (HFA) may benefit from early detection of emotional changes and prompt provision of adaptive emotional regulation tools to manage negative emotions. An emotion identification approach using facial expressions was proposed in this work. For the objective of creating emotion identification classifiers, an experiment was conducted to gather facial-based landmark signals.

Existing System:-

Expression recognition using brain activity, In Expression recognition using brain activity the developer Robert Horlings has used brain activities which is toughest task to do as it become expensive, complex and also time consuming when we try to measure human brain with Electroencephalography (eeg). They have used existing data and the result of their analysis were 31 to 81 percentage

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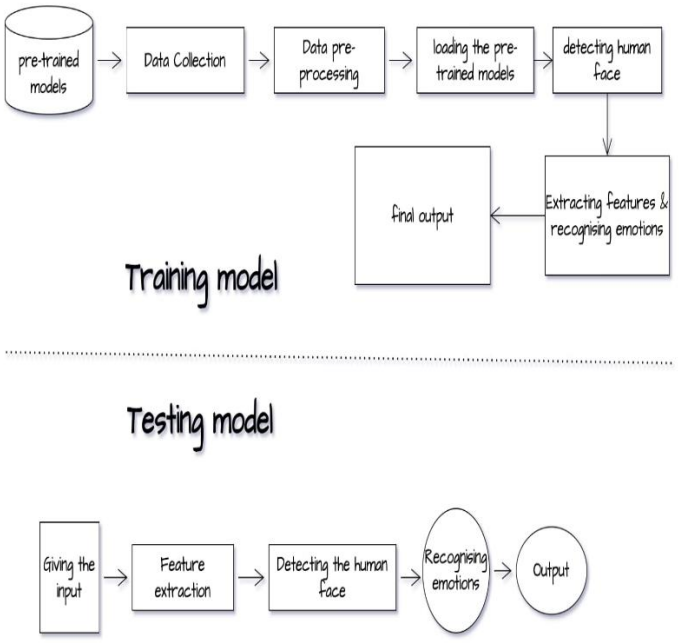
correct and from which even by using Fuzzy logic 72 to 81 percentage only for two classes of Expressions. Apparently, the division between different Expression is not (only) based on EEG signals it depends on some another.

Proposed System:-

We are using facial expression as with Convolutional Neural Networks which gives best results when it comes to pattern recognition in image which additional Haar-Cascade to detect the ROI (region containing the face). It can be used by anyone having a pc with camera without any kind of special hardware with almost same accuracy as the expensive brain activity monitor and it works on Tensor Flow framework which allows the program to be ported for different platforms and applications like android apps or web apps. The system will be able to detect face of the person available in webcam and then extract the information and detect the relevant Expression of them. Meanwhile the system will be showing similar emojis to the user.

4.IMPLEMENTATION-



First of all when the user registers into the application, it requests the user to capture a selfie. This image is then divided into different sections of the face, such as forehead, eyebrows, lower eye, right check and left check. After all the pre-processing is done, then with Convolutional neural network it trains the given dataset user's image it detects emotion and give accordingly suggest tasks to change mood of sad, depressed person and with every epoch accuracy increases. Then with the user's image it detects emotion and give accordingly suggest tasks to change mood of sad, depressed person.

During training Phase, the system received a training data comprising grayscale images of faces with their respective expression label and learns a set of weights for the network. The training step took as input an image with a face. Thereafter, an intensity normalization is applied to the image. The normalized images are used to train the Convolutional Network. To ensure that the training performance is not affected by the order of presentation of the examples, validation dataset is used to choose the final best set of weights out of a set of trainings performed with samples presented in different orders. The output of the training step is a set of weights that achieve the best result with the training data. During test, the system received a grayscale image of a face from test dataset, and output the predicted expression by using the final network weights learned during training. Its output is a single number that represents one of the seven basic expression.

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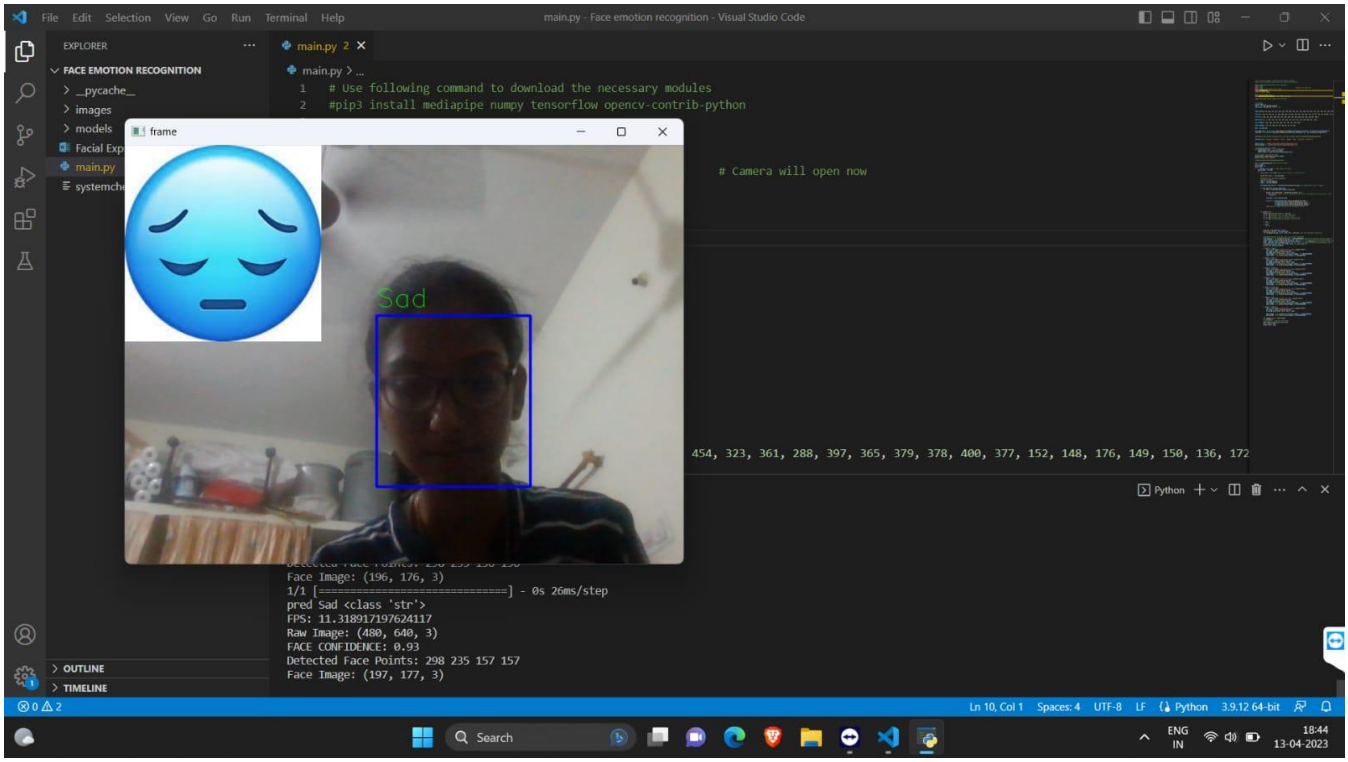
5.Results-



6.Conclusion-

In this project, the recognition of emotion has been attempted in real-time video stream. The proposed method of using the general architecture of CNN has been successfully implemented. With this attempt, we have come to the conclusion of the detection of emotion. A successful completion of the proposed method has been made with better accuracy. The difficulty is faced due to the intensity of the light. Low background lighting led to a bad quality image that eventually increases the errors in the pre-processing of the image.

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8.Appendix-

OpenCV - Open Source Computer Vision Library

LINUX - Lovable Intellect Not Using XP
NUMPY - Numerical Python
MATLAB - stands for Matrix Laboratory
PANDAS - Python Data Analysis Library
Sklearn - Scikit-learn
IDE - Integration Development and Environment