Video Emotion Detection

Introduction:

Emotion recognition is the process of identifying and classifying the human emotions based on their facial expressions. In this project, we have developed a real-time emotion detection system that operates on streaming video data and identifies the predominant emotion in each frame.

Background:

This project has been implemented using Python Programming Language. And the various packages used are OpenCV (to read the streaming video content), Numpy(to perform numeric operations), Tensorflow (for backend) and Keras (to build the classification model). The input is a streaming video in which the faces will appear in a rectangular frame, and at the output the emotions of each frame will be detected and predicted.

Learning Objectives:

The main objective of this Emotion Detection system is to produce an automatic model which can detect different emotions in people and can identify the people who are sad, happy, neutral, surprised, disgusted, angry, fear etc. This has many uses like it can help job interviewers to understand the candidate’s personality traits, it can help improve customer relationship management etc.

Activities and Tasks:

The input (face of the image) in the video is first detected by the help of haarcascade classifier. The face image is then passed through the emotion detection model and then the model detects the respective emotion of the face image. Whether there are one or more face images in the video, the Emotion Detection Model detects the emotions of each face in the video.

Skills and Competencies:

Installation of Python 3.8 version, install all the necessary libraries in it like numpy, openCV, matplotlib, tensorflow, jupyter notebook etc. Installation of Anaconda prompt for checking the output. Python coding is done in Jupyter notebook and in Visual Studio Code. Convolutional Neural Network layers has to be defined. Programs are run on Kaggle also for a better optimized output.

Feedback and Evidence:

There is a lot of things that we can learn from this project. It is a complete use of Deep Learning of CNN in Python. References are taken from:

1. Text Book “Python Programming by Reema Thareja”.
2. Few research papers.
3. Few previous works on which people have already worked.

Challenges and Solutions:

The main challenge of this drowsiness detection system is that sometimes it cannot detect the face of the user or sometimes it cannot give very accurate results. And the solution to this challenge is that we have to train the model with more number of epochs to get better and accurate results or we should train the model with more number of images.

Outcomes and Impact:

The haarcascade frontalface algorithm detects the front face of each image. Our neural network which was trained with facial expression dataset is able to predict the emotion of each frame in the streaming video data and categorize them into happy, sad, anger, fear, surprised, disgusted or neutral. And our model can predict the emotions of more than one images those are visible in the video.

Conclusion:

A classification method is implemented in which the face images are used to train a classifier predictor which predicts the seven basic human emotions which are given in a test image. Our predictor model successfully predicts the test data from the same dataset which was used to train the classifiers.