Emotion Detection and Reacting Emojis in chat

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ABSTRACT

Emojis are ways to indicate verbal cues. These cues have become an essential part of online chatting, product review, brand emotion, and numerous further. It also leads to adding data wisdom exploration devoted to emoji driven liar. With advancements in computer vision and deep learning, it's now possible to identify expressions from images. Interpersonal relations are affected by facial expressions, which convey verbal cues.

The automatic recognition of human facial expressions can be an important aspect of human and machine interactions and it may also be used in behavioural wisdom. The discovery of feelings in facial expressions has always been easy for humans but doing the same thing with a computer algorithm is relatively difficult. As a result of recent advancements in machine learning, it's now possible to recognise the emotions through the facial expressions of human.

In this deep learning design, we will classify human facial expressions to match and map with the corresponding emojis. Our design use human 'facial emotional expressions as system input to map emojis by identifying the expression. Despite that emojis can represent conduct, objects, nature, and other symbols, the most generally used emojis are faces which express emotion. An emoji is a visual representation of a vocal message. Online chats, product reviews, brand sentiment, and more all rely on these indications. Adding emoji-driven liar data exploration is also a result.

Machine learning & computational intelligence developments have made it possible to recognise facial expressions in photographs. Facial expressions influence interpersonal relationships because they carry language cues. In human-machine interactions, the ability to recognise human facial expressions automatically can be useful, and it can also be applied to behavioural wisdom. For humans, discovering emotions in facial gestures has always been simple, but doing so with a predictive algorithm is more challenging. Machine learning developments have made it possible to identify human emotions based on facial expressions. Emojis will be mapped to human facial emotions using this deep learning approach

INTRODUCTION

A person's facial expressions can identify their feelings because they correspond to their emotions. It can be considered as a concrete way of detecting whether persons are being honest or not based on facial expressions, since they are non-verbal ways of expressing emotion. We express our emotions through our voice, hand, and body gestures, and mostly through our facial expressions. People express their emotions in day-to-day interactions. Emojis are visual representations of emotions. Modern communication apps like Facebook, WhatsApp, Twitter, etc. use emoji to express emotions

The automatic recognition of human facial expressions can be an important aspect of natural human-machine interfaces; it may also be used in behavioural science. Humans can recognize facial expressions more quickly without any effort, but machine expression recognition is still difficult. Over the past few years, advances in face detection, mechanism for feature extraction, and techniques to classify facial expressions have been made, but it is difficult to develop an automated system to accomplish this task. Techniques for detecting facial expressions have been reported in two distinct ways. Using an explicit classifier, the first method allows separation of facial expressions, whereas the second method uses extracted facial highlights to determine facial recognition. In the facial action coding system (FACS), action units serve as markers for expression.

The goal of this analysis is to identify instances of emotional recognition in the data collected as part of routine operations. Happiness, fear, disgust, rage, sadness, surprise, and disdain are some of the most common emotions. The goal of this project is to build a deep learning model that can recognise and categorise face emotions. We can then use an emoji or an avatar to represent the labelled emotion.

Existing system

Current approaches focus mainly on facial investigation, maintaining the background intact and thus constructs a large number of unnecessary and misleading characteristics that confuse the process of CNN formation. Predicting the human emotions through their facial expression. Most of the current approaches are not so accurate. Some approaches take lot of time to detect the facial expressions.

Components of the Model

1. User Requirements: In this project we use user real time facial expression to map with the respective emoji. Where we have to detect the user facial emotion and have to map with the respective emoji with the detected emotion.

2. Hardware Requirement: Deep learning necessitates a massive amount of processing power. Graphic Processing Units (GPUs) with high performance are ideal because they can manage a big volume of operations in several cores with enough of memory. Managing numerous GPUs on-premises, on the other hand, can place a significant strain on internal resources and be extremely costly to grow. 1. Processor: core(i5) 2. Speed: 2.21 GHz 3. Ram: 8 GB 4. Hard Disk: 1 TB(HDD) 3.2 Non

3. Python 3.9 Python is a free open source tool for constructing and assessing deep learning models that is both powerful and simple to use. It covers the fast numerical computation libraries and lets you define and train neural network models with just a few lines of code.

4. Open CV OpenCV Python Server side Programming is a programming language that is 10 used to create web applications. OpenCV is a Python package for dealing with computer vision issues. Understanding and analyzing digital images by a computer, as well as processing and providing pertinent data once the image has been analyzed, are all examples of computer vision.

5. Pillow The most popular and de facto standard library in Python for loading and working with image data is Pillow. Pillow is an updated version of the Python Image Library, or PIL, and supports a range of simple and sophisticated

image manipulation functionality. It is also the basis for simple image support in other Python libraries such as SciPy and Matplotlib.

6. Tensorflow(keras) Keras is compact, easy to learn, high-level Python library run on top of TensorFlow framework. It is made with focus of understanding deep learning techniques, such as creating layers for neural networks maintaining the concepts of shapes and mathematical details.

General Block Diagram

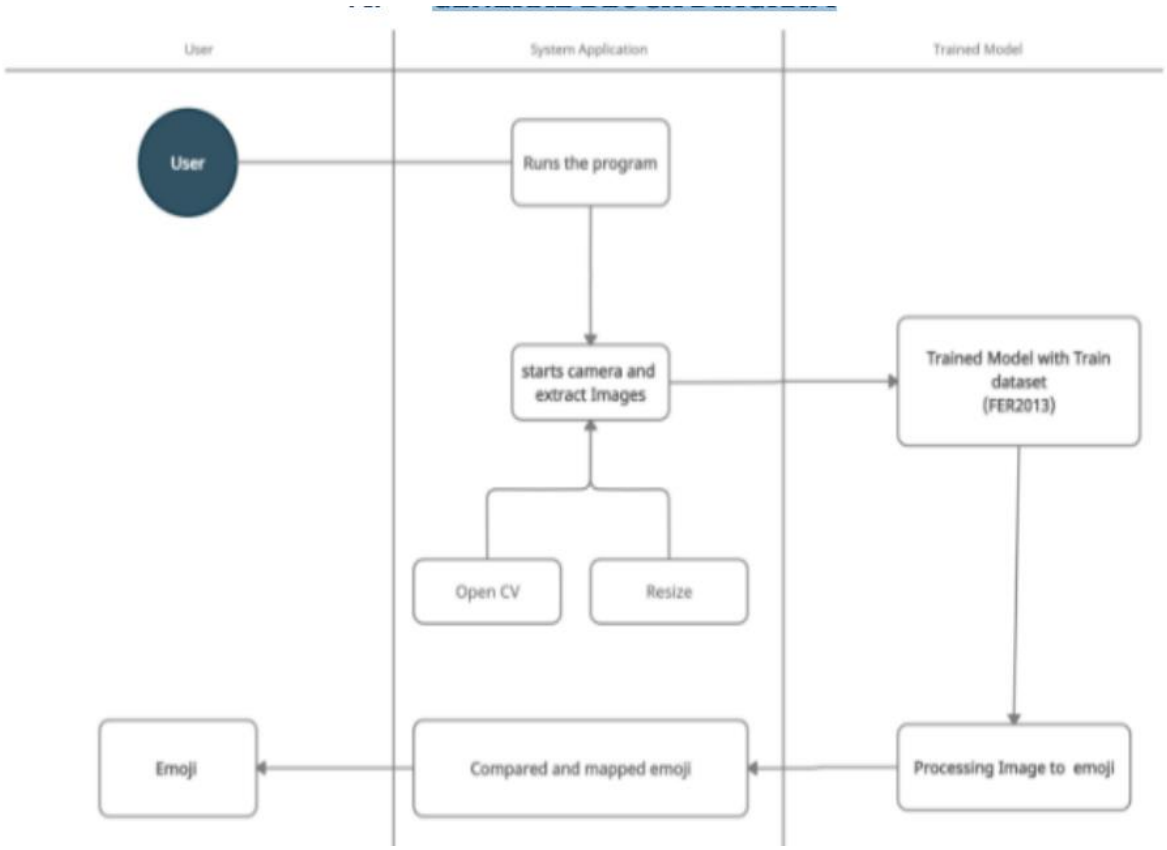

Fig 1: Block Diagram

Working Mechanism

The process of FER has three stages. The preprocessing stage consists of preparing the dataset into a form which will work on a generalized algorithm and generate efficient results. In the face detection stage, the face is detected from the images that are captured real time. The emotion classification step consists of implementing the CNN algorithm to classify input image into one of seven classes.

Procedure

The proposed system carries out in three steps as Face Detection, Face Recognition and Face Classification. In the first step a video camera is used to capture real time human face and detect the exact location of face by a bounding box coordinates. Face detection is performed using Haar cascade detection with open CV library. The images detected have shapes, objects and landscapes etc. In this phase human face is detected and face features are extracted and stored in the database for face recognition. The CNN model is used to classify human emotions. Faces are recognized from the database and are compared to identify or detect the face through embedding vectors. First face is detected and then recognized with the database features and matching using CNN model training and testing database. Finally, the recognized human face is classified based on the expression in real time as Angry, fear, disgust, happy, neutral and surprise.