

Facial Recognition and emoji generation

Nowadays modern communicating apps on products of Apple or Samsung provide features such as custom emoji generation using facial recognition. The automatic recognition of human facial expressions can be an important aspect of natural human-machine interfaces; it may also be used in behavioral science. Over the past few years, advances in face detection mechanisms 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. The approach to this problem has been dealt in two ways, the first method allows separation of facial expressions using an explicit classifier, whereas the second method uses extracted facial highlights to determine facial recognition.

GENERAL

A human's face is capable of making 70,000 different facial gestures which are basic emotions, independent of the culture in which a human grows with the permutation and combination of seven phrases (anger, fear, happiness, sadness, contempt, disgust, and surprise). They used an invariant three-dimensional positional approach using topic-specific descriptors. There are many problems such as excessive make-up and expression that are resolved using convolutional networks. Very recently, researchers have made extraordinary accomplishments in the facial expression detection, which helps in improving of neuroscience and cognitive science, in the field of facial expression. As well, the development of computer vision and machine learning makes the identification of emotions much more specific and accessible to the general public. Consequently, the recognition of facial expression develops rapidly as a sub-field of image processing.

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 a lot of time to detect the facial expressions.

METHODOLOGY

First, approach towards this is by downloading the data-set and loading it on to loader of train and test cases. Creating the architecture of this system based on CNN, usually in 6-layered neural network, and thus reducing the kernel size to scan it by base layer to check the emoji.

Open CV OpenCV Python Server side Programming is a programming language that is 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.

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.

And several other libraries based on whether a person wants to use pytorch or tensorflow. The data comprises of grayscale images of faces at a resolution of 48x48 pixels. The faces have been automatically registered such that they are more or less centered in each image and take up around the same amount

of area. The aim is to categorise each face into one of seven categories based on the emotion displayed in the facial expression (0=Angry, 1=Disgust, 2=Fear, 3=Happy, 4=Sad, 5=Surprise, 6=Neutral). There are 28,709 examples in the training set and 3,589 examples in the public test set.

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

CONCLUSION

Thus mapped emojis is used to classify facial emotions over static facial images using deep learning techniques. Emojis are approaches to signify nonverbal cues. These cues have come to be a crucial part of on-line chatting, product review, logo emotion, and plenty of more. It led to growing advanced studies related to emoji-driven storytelling. Machine learning model accuracy is the measurement used to determine which model is best at identifying relationships and patterns between variables in a dataset based on the input, or training, data. We can also include many more emojis that include hand gestures etc. We can also try to implement this in keyboards that we use for easier and quicker access of this facial expression detection and emoji generation. We can also try to display a customized emoji of the person's face. We can also increase the speed by implementing it on GPU. A GPU (Graphics Processing Unit) is a specialized processor with dedicated memory that conventionally performs floating point operations required for rendering graphics.