

Enhancing Emotion Recognition System Using Machine Learning

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Abstract: Enhancing emotion recognition system is a real time project. The aim of project is to recognize human emotions using computer. Computer vision is important for plenty of real-world things like AI, Human Robot Interaction (HRI), sign language etc., because computer vision is field of computer science that focuses on computers to identify and understand objects and people in images and videos. Plethora of researches have been done to analyze human emotions using facial expressions. Our work is based on two modalities. Our objective is to efficiently compute emotions recognized from facial expressions and upper body gesture of humans through camera using images. There are many feature in this project. We have provide different links of videos, images and quotes to user for making them feel better.

INTRODUCTION :

Enhancing Emotion Recognition System is real time project. In Enhancing Emotion Recognition System we have focused on facial expressions and upper body gesture of human where we detect human's emotion. Emotions are intended expressions which shows the pleasure or displeasure. We humans express our emotions in various ways: Facial expression (non-verbal), body gesture, verbal, documented format (written) etc., basically, there are seven main emotions: disgust, anger, fear and neutral, surprise, sad and happy. The action of identifying emotions from facial expressions is called Facial Emotions Recognition (FER). We are using SQL database server for storing data. And the overall coding will be done in JAVA and Python language. This project will help to those who could not express their needs, emotions to other people & as well as mentally disabled person. This application can be used in COVID-19 Centre for patients' mental health as well as in mental hospitals. Psychiatrists can also use this application. People at various levels can use it for their entertainment purposes in future. We are providing 94.02 % accuracy. Our aim is to provide robustness and high accuracy.

EXISTING SYSTEM :

In the existing system people used feature-level fused bimodal emotion recognition. Model is based on two different modalities: facial Expressions and upper body gestures. In that previous work, people have only detected and displayed emotions. Plenty of researchers focused on single modality only using computer vision which doesn't gives high accuracy. Some researchers made sensor based projects. Algorithm used for implementation are old. Existing projects are not real time applications.

LITERATURE SURVEY :

In[1]Tanaya Keshari and Suja palanswami the author of facial expression recognition the has proposed the AED-2 is used for detecting the heart rate. Image is detect using CNN algorithm and hand gesture is detect using k-mean algorithm is proper way. Author will use SVM, HMM algorithm for accuracy. The elementary notion of HOG features is to map the local object shape and appearance by scattering of edge directions or local intensity gradients.

In [2] Daniel Candedo, J.R. Neves are the authors of facial expression using computer vision has proposed FER technique for a better understanding, such as face detection, smoothing, Principal Component Analysis (PCA), Local Binary Patterns (LBP), Optical Flow (OF), Gabor filters, among others also, for better result find the difficulties transfer into higher facial expression recognition accuracy in controlled or uncontrolled environments.

In [3] Jyoti Kumaria and R. Rajesha, KM. Pooja are the authors of facial expression recognition has proposed survey about emotion and facial expression like eye, cheek, nose, mouth and work on accuracy for better result. Histogram of oriented gradients is usually for checking image in pixel and gives proper result. Overall to increase the accuracy rate of predicting the expressions, applications based on dynamic images/sequence of images/videos, and to handle occlusion.

In[4] Zafeiriou, S. Zhang, C. Zhang, Z. are the authors of facial Expression Detection author has proposed development of robust computer vision algorithms. In this paper, we survey the recent advances in real-world face detection techniques, beginning with the seminal Viola-Jones face detector methodology. These techniques are roughly categorized into two general schemes: rigid templates, learned mainly via boosting based methods or by the application of deep neural networks, and deformable models that describe the face by its parts.

PROPOSED SYSTEM :

People at various level can use this software for their entertainment purpose. This software is mainly designed for mentally disabled person. This project will help to that person who could not express their needs, emotions to other person. Psychiatrist can also use this application. they spread inside the photos, for example very little, medium, and large. Inside the trying out stage, those three gatherings of tips fill in due to the fact the complaint of each short CNN machine to perform face recognition in addition to face object size, consequently on enhance face region accuracy.

The human face plays significant role in identifying a one's mood. Camera is used to get the needed input from the human face. Our proposed system focuses on providing accurate result according to the "emotion" derived from the input provided from the user. First we captures the image from camera through mobile app and after capturing the image, image will send to the database into the server flask app. After storing image into training dataset, check the emotion in terms of pixel. Then that face will be used for emotion detection using CNN algorithm. Once we recognized, the image generated the model in terms of prediction. After all this process, System will play the song, also system will display various results depending on user's online/offline status.

For detecting face in the image we have used Cv2 Dnn face model. Cv2 Dnn also used to detect user's age and gender. It is a pertained model, we haven't train it we used it. Also we have used media pipe library for getting body arguments and then activity classification will be done by Random Forest Algorithm.

We are using two main algorithm -Random Forest and CNN. Random forest is used for body detection and CNN model is used for face detection. For achieving higher accuracy we have used 63% of face and 36.09% of upper body gesture.

We are using SQL database server for storing data. And the overall coding will be done in JAVA and Python language. For frontend we have used HTML, CSS and JS and for backend we have used Flask & Python.

Anaconda is a python distribution which includes plenty of libraries and packages and its main purpose is to perform python, data science and machine learning projects. Therefore we have used this software to run the python coding in efficient manner.

Additional Features mentioned below:**1) If user is offline:**

Play song according to emotions (must have stored MP3 files in server). For ex. If user is happy play songs which will make him happier, song which will motivate him, inspired him.

If user is feeling blue then play songs which will get out of him from that mood and make him feel better.

Along with song display images which will help user to feel calm and relaxed. For ex, different kind of nature images, funny images which will make laugh to user. Pictures of great people with short brief about their history which will inspire the user.

Save set of different types of quotes and display according to detected emotion of user.

2) If user is online:

Provide different YouTube songs-MP3 & MP4 links.

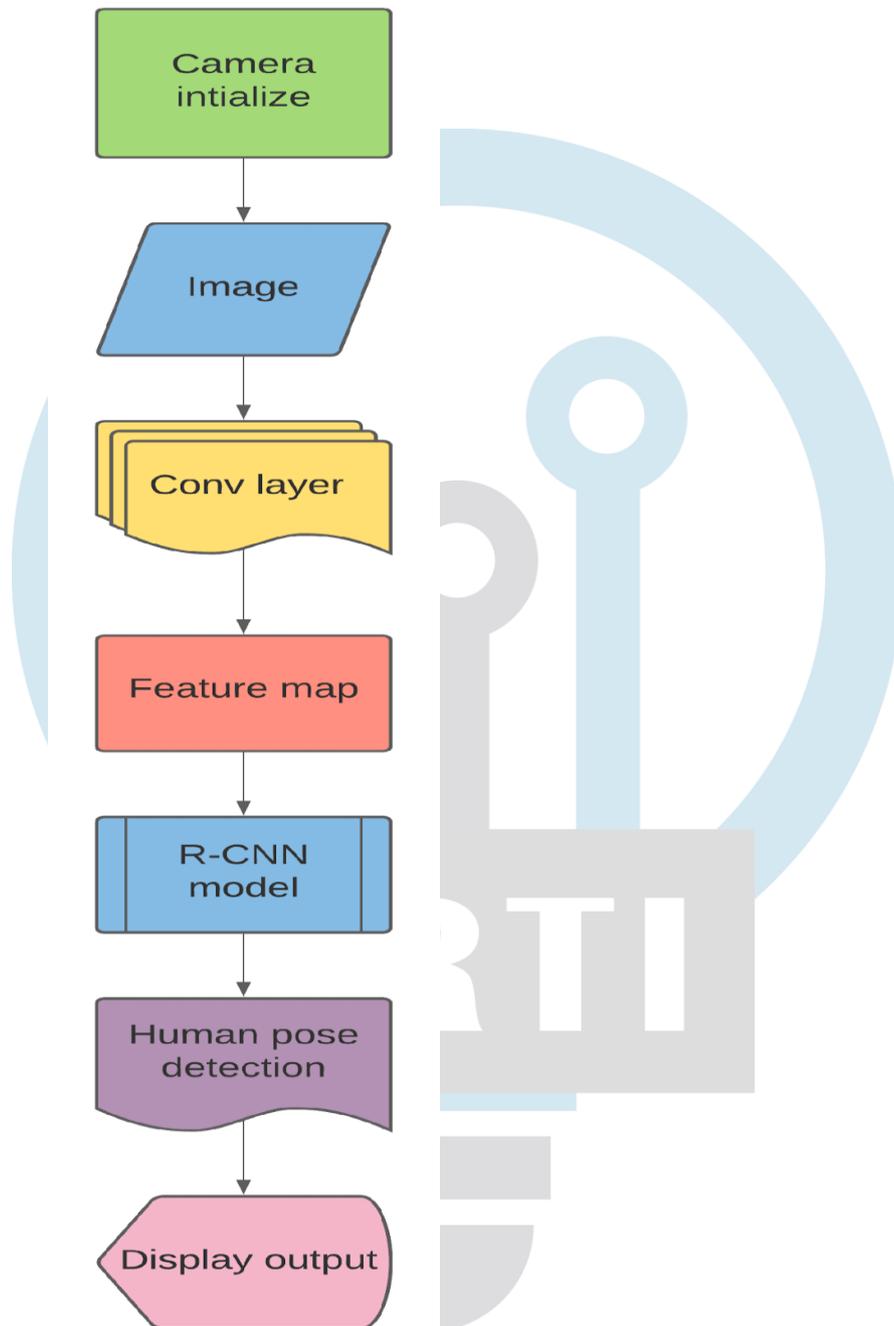
Provide different YouTube Channel Links

Play videos through links –funny , comedy , motivational , relaxing etc. according to emotion

If user is mentally disturb and need consultation – suggest him to call doctor and provide doctors details and number.

Links of websites which has funny content on it. For ex. Jokes etc.

FLOWCHART :



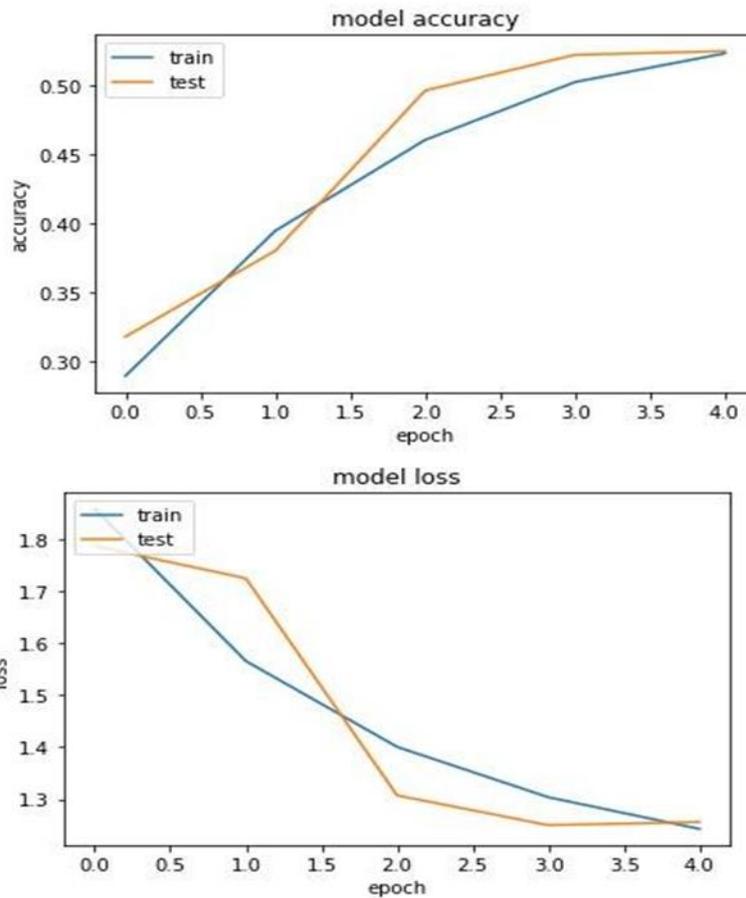
RESULT :

We are achieving 94.02 % accuracy. This study recommends that project is implemented in order to improve the accuracy of emotions recognized by the system. We have detected several emotions through facial expressions and upper body gesture in two ways:

We have stored plenty of emoji's images and user's images in database.

Directly through camera.

This application needs to detect the emotions which people could not expression due to any reason. Only if this application can detect accurate emotions of humans then mental health sector will flourish even faster and the result will be visible in the health sector of our country.



CONCLUSION :

In our paper, we have successfully presented a emotion recognition system where we have focus on facial expressions of human beings. We used single modality in which emotions are recognized from facial expressions only. After working on this single modality we understood that this approach achieves higher recognition. This application we can used in real world at various level for different purpose.

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