



Artificial Intelligence

Project report submission

Emotion based music recommender

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Introduction

Music is considered as the core ingredient which directly attacks and relates to the individual mood and emotions. People feel it and live it fully. Music is the only thing which can rapidly changes one's mood.

Side by side emotions also take crucial part in the recipe of music. People listen to music according to their mood and emotions. Among the various ways of expressing emotions, including human speech and gesture, a facial expression is the most natural way of relaying them. Our proposed project relates to both major ingredients, emotions, and the music. We present the new emotion based and user interactive music system namely emotion-based music recommender. It aims to provide user preferred music with emotion awareness, the main objective of the model is to efficiently detect the face and emotions of the user via webcam and based on the emotions recommend appropriate songs via YouTube. Emotion detection is the task of recognizing a person's emotional state Artificial intelligence can detect the emotion of a person through the facial expressions. Emotion detection have six main data of emotions happiness, sadness, fear, surprise, rock, and anger. This project can easily detect that emotion of person According to the emotion YouTube will suggest the song.

These emotions are very subtle. Facial muscle contortions are very minimal and detecting these differences can be very challenging as even a small difference results in different expressions Also, expressions of different or even the same people might vary for the same emotion, as emotions are hugely context dependent While we can focus on only those areas of the face which display a maximum of emotions like around the mouth and eyes Usually before extraction of features for emotion detection, face detection algorithms are applied on the image or the captured frame. We can generalize the emotion detection steps as follows

- 1) Dataset preprocessing
- 2) Face detection
- 3) Feature extraction

We focus on the feature extraction technique and emotion detection based on the extracted features. After that focuses on some important features related to the face. And gives information on the related work done in this field. Related work covers many of the feature extraction techniques used until now. It also covers some important algorithms which can be used for emotion detection in human faces. And details the tools and libraries used in the implementation. In the last explains the implementation of the proposed feature extraction and emotion detection framework. And highlights the result of the experiment



Methodology

In this system we consider the notion of collecting human emotions from the user's expressions and explore how this information could be used to improve the user experience with music.

As our proposed project is wholly solely based on facial emotion detection and recommendation of the songs.

So, we have trained our model accordingly, which works like mentioned below.

1. AI model will detect our facial emotions
2. Ask for the favorite singer
3. Ask for the language
4. Recommend songs through YouTube

Now initially, the first step is that AI model will detect the user's facial expressions through webcam. We have done this through face cascade model.xml. We have trained and tested our model on the various emotions like sad, happy, angry, fear, surprise, emotional and neutral. User's live facial emotions are being detected and stored.

Secondly, based on the previous terms, the model asks for the favorite singer. The favorite singer, which the user wants to listen or likes the most.

Then after, it asks for the language in which the user wants to listen the song like Punjabi, English or Urdu etc.

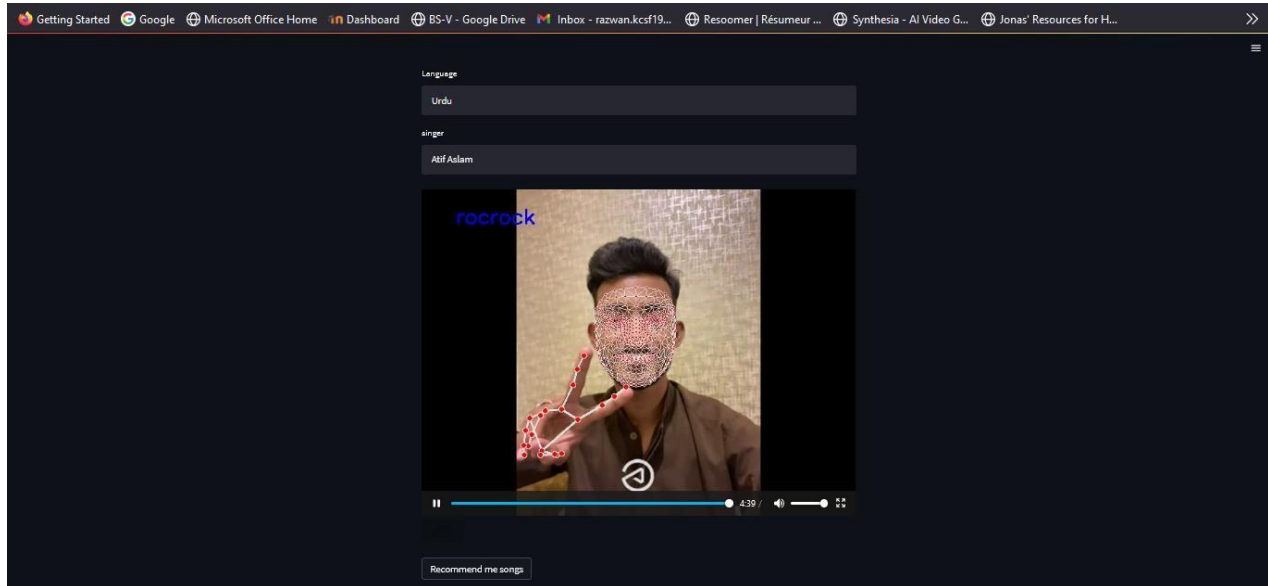
Lastly when user hit the button of recommend me, the page directs to the YouTube interface and the lists of the desired songs is displayed which is completely based on the user choice and information which is being done previously.



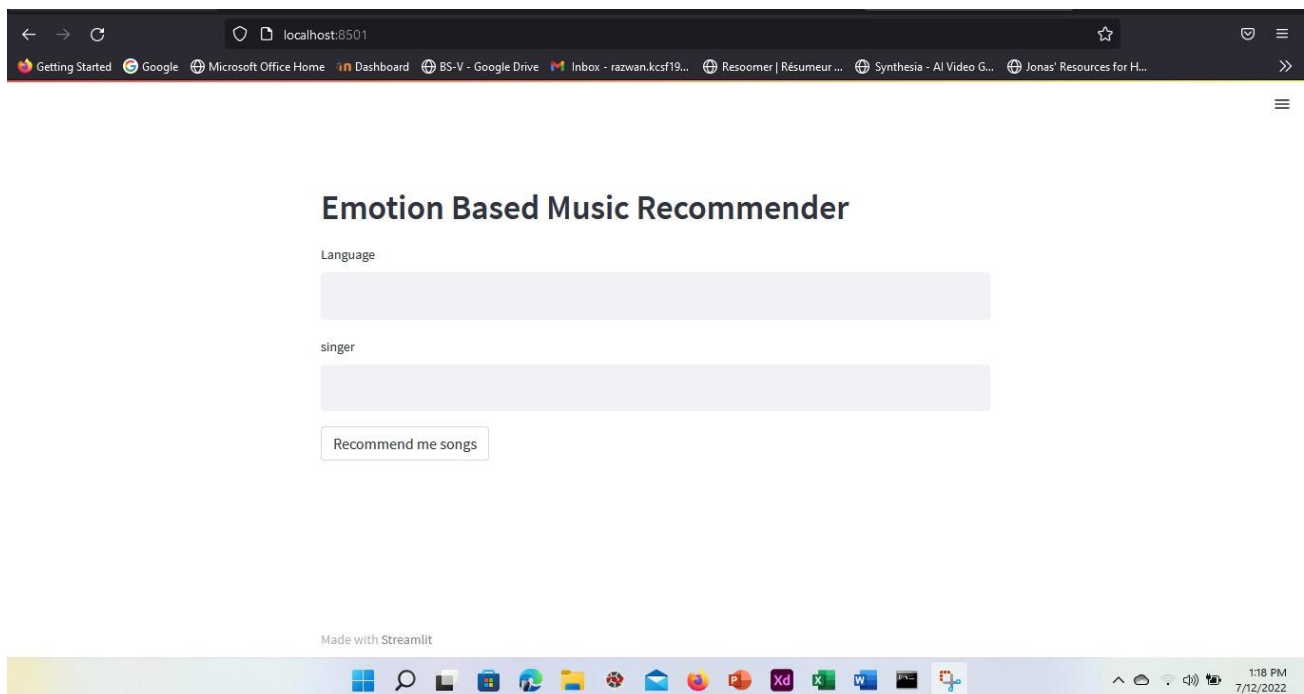
Evaluation

We have tested the model working and took its screenshots as mentioned below.

Here initially, the face and emotions/gesture of the user is detected, based on the user's gesture model guessed it, like in the given photo the user gave gesture like rock, it is detected here.

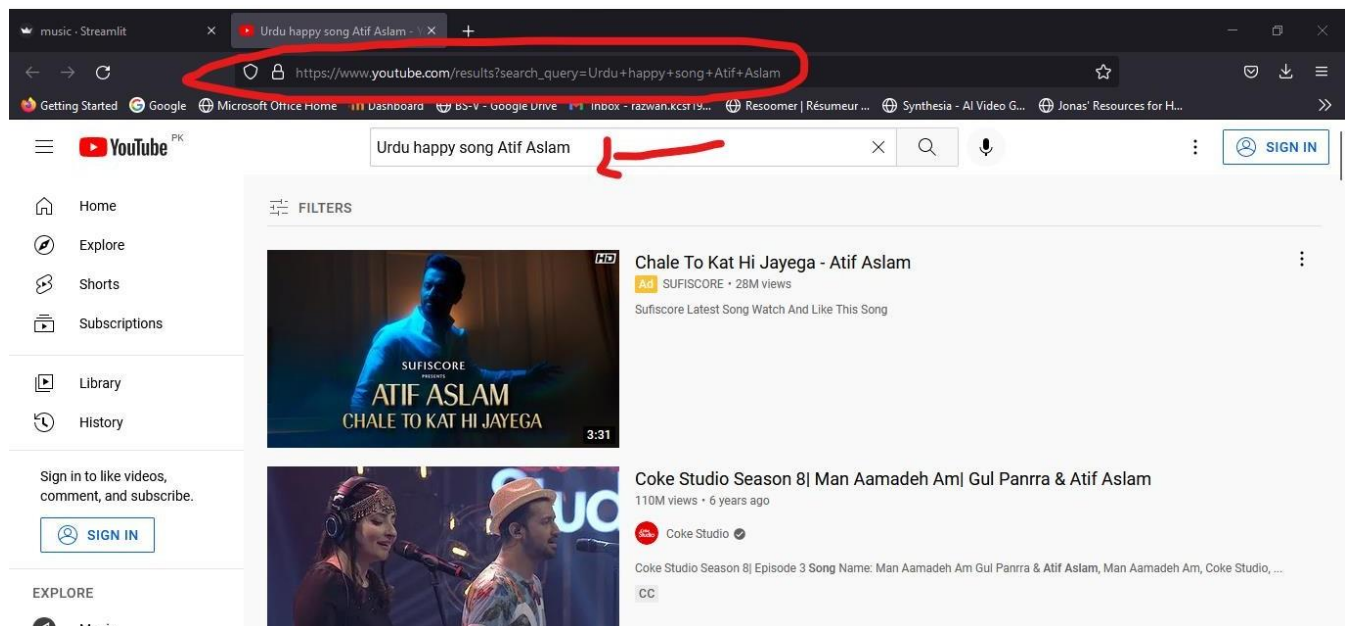


Then after, there are two questions asked from user like the favorite singer and the language in which user wants to listen the song.



```
C:\Windows\System32\cmd.exe - streamlit run music.py
happy
2022-07-12 14:03:24.821 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 35ms/step
susurprise
2022-07-12 14:03:25.177 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 40ms/step
susurprise
2022-07-12 14:03:25.584 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 61ms/step
susurprise
2022-07-12 14:03:25.992 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 37ms/step
susurprise
2022-07-12 14:03:26.365 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 40ms/step
susurprise
2022-07-12 14:03:26.777 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 36ms/step
susurprise
2022-07-12 14:03:27.119 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 40ms/step
rocrock
2022-07-12 14:03:27.498 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 36ms/step
rocrock
2022-07-12 14:03:27.856 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 33ms/step
rocrock
2022-07-12 14:03:28.242 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 58ms/step
rocrock
2022-07-12 14:03:28.647 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 73ms/step
rocrock
2022-07-12 14:03:29.211 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 84ms/step
rocrock
2022-07-12 14:03:29.657 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 23ms/step
rocrock
2022-07-12 14:03:30.030 Some frames have been dropped. `recv_queued` is recommended to use instead.
1/1 [=====] - 0s 33ms/step
rocrock
```

Then, in last when the user hit recommend me song button, based on the given information the recommended song list on YouTube is being displayed for user as shown next.





Purpose

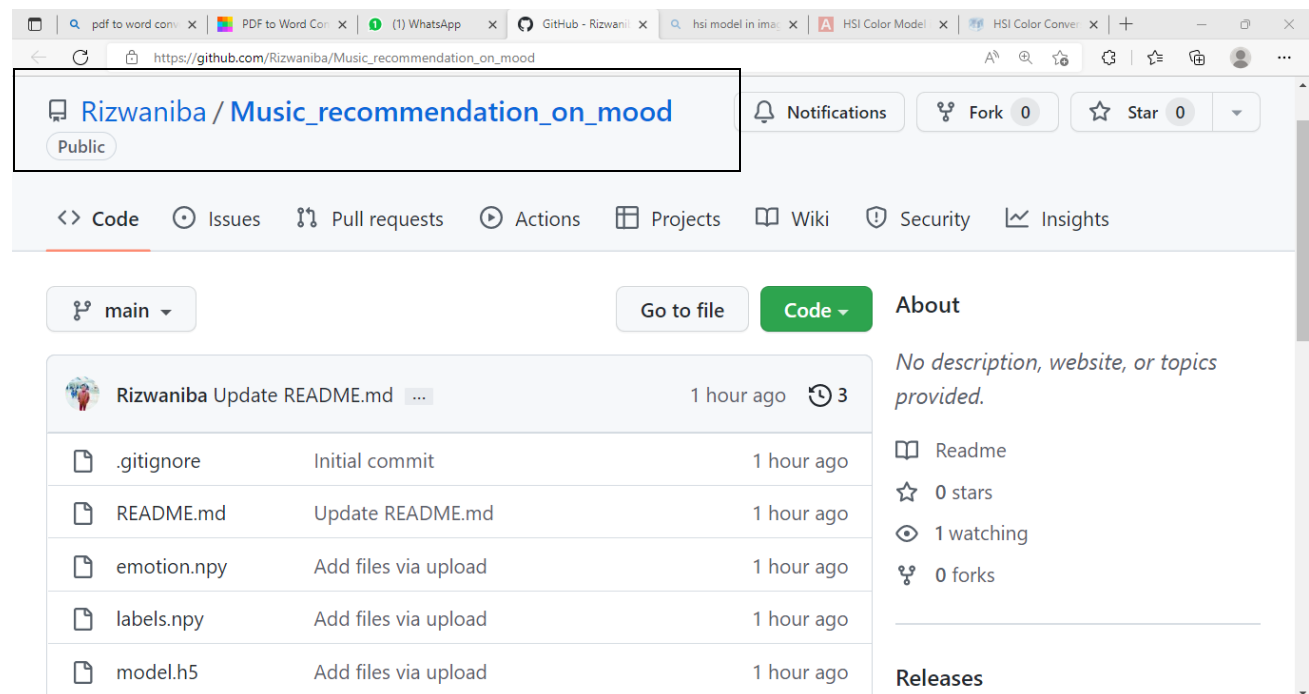
To reduce the human effort and time needed for manual segregation of songs from a playlist, in correlation with different classes of emotions and moods, various approaches have been proposed,

The proposed model has vanished the search techniques, sometimes it happens, we are excited and wants to dance on a rocking song but don't know exactly the songs of that category so this model will help in that situation, just user must show his excitement by giving that type of facial expression he directly will approach to those songs. Easy...!

It removes the risk which user faces, the task of manually browsing the playlist of songs to select. It also saves time and protects from doing much browsing.

Deployment reference

We have kept our project on GitHub



Our contribution

we have used streamlit open-source framework of python It helps us create web apps for data science, artificial intelligence and machine learning in a short time.

We are asking from user it's favorite singer and language as an input, that we are capturing user's emotion/mood using A.i model , then we're storing mood in {emotion} variable.

Using webbrowser utility we are proceeding youtube search query like this:

https://www.youtube.com/results?search_query={lang}+{emotion}+song+{singer}

as we have defined variable {lang}, {emotion} and {singer} already!

References:

We are detecting emotion using “**Model.h5**” which is publicly available over internet, we took code from GitHub from emotion detection.

Multiple links from where got help.

<https://github.com/maelfabien/Facial-Emotion-Recognition/tree/master/Models>

https://huggingface.co/bhadresh-savani/albert-base-v2-emotion/blob/main/tf_model.h5

https://www.tensorflow.org/guide/keras/save_and_serialize