

Music Recommendation Based on Current Mood Using AI & ML

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Abstract - Music always has a special connection to our emotions. It is a method of connecting people all over the world through pure emotions. When all of this is considered, it is exceedingly difficult to generalize music and state that everyone would enjoy the same type. Music recommendation based on mood is greatly needed because they will assist humans in relieving stress and listening to soothing music based on their current emotions. Its primary goal is to accurately predict the user's mood, and songs are played by the application based on the user's selection as well as his current mood. This bot recognizes human emotions from facial images using Human-Computer Interaction (HCI). The extraction of facial elements from the user's face is another critical factor. We used the CNN Algorithm to accurately detect the user's face in the live webcam feed and to detect emotion based on facial attributes such as the arrangement of the user's mouth and eyes. There is also a questionnaire where we can directly select a good option.

Keywords: Music Recommendation, emotion detection, human emotions, Human-Computer Interaction.

I. INTRODUCTION

Music and emotion are inseparably connected, and they can affect each other. At the equivalent time, sure styles of track can substitute a people's emotion. Music counsel fundamentally founded absolutely on temper is essentially needed as it will help individuals in easing strain and focusing on calming track principally founded absolutely on their contemporary day sentiments. The undertaking will probably hold onto a singular feeling by means of looks. A track member is intended to hold onto human feeling the utilization of the PC's web advanced digicam trademark. Our product captures the individual's photograph after which, the utilization of photograph-handling strategies, extricates capacities from the

detecting the facial features of the user by webcam. Once an emotion is detected, the app will play a song based on the emotion detected.

The purpose of the system is to analyse the user's images, predict the user's facial expressions and recommend suitable songs based on the detected emotions.

II. LITERATURE SURVEY

2.1 Fisher face Algorithm – Multidimensional reduction process that brings together or organizes raw data that has been dimensionality reduced to many other categories. Capture user emotion through web cameras to capture user images. The captured image is enhanced by following the raw data dimensionality reduction process. This data is converted into a binary image format and the Fisher's face and Harcascade methods are used to detect faces.

Initial or raw data is extracted from faces and reduced to many other classes. Use the methods described above to sort and organize these classes. Detect emotions by extracting facial features. The main goal of the feature extraction module is to reduce the number of resources required for large datasets. The image features consist of 3 parts.

1. Border/Edge
2. Projection corner/point
3. Field Point

Initial or raw data is extracted from faces reduced to this image-processing system using principal component analysis (PCA) to reduce the dimensionality of face space and then applies Fisher's Linear Discriminant method (LDA) or LDA to obtain face features. We use it because it maximizes the separation between classes during training. This

algorithm helps to handle the image recognition performed in Fisher's face, while to match faces we use the Euclidean algorithm which helps us classify expressions that suggest the user's emotions.

Anukritin et al. [1] proposed an algorithm that uses the Fisher Face algorithm to list songs in a user's playlist based on their emotions. The designed algorithm focuses on reducing the computation time and therefore the costs related to the use of various hardware. The main idea is to classify emotions into five categories i.e. Joy, sadness, anger, surprise, and fear also provides a highly accurate audio information retrieval method that can extract relevant information from audio signals in less time.

2.2 ANN Model – Developed by Renuka R Londhe et al. [2] have published an article on face curvature changes and corresponding pixel intensities. The authors used an artificial face and attempts to stagger on the feeling that the individual is making an endeavour too explicit. Adding excellent perceptual abilities to PC frameworks could allow them to work together as personal mates with individuals. Scientists attempt to introduce PC frameworks with more noteworthy capacities while heading to allow them to have connection with individuals, acknowledge human presents, talk, tune in, or even bet their sentiments. It utilizes greatest present-day camcorders and amplifiers to find the individuals developments by means of involving conferred tactile abilities in a non-meddling detecting strategy. The framework can understand what an individual needs, wherein he's looking, or even his real or close-to-home states. Thus, the Feeling of Identification. We utilized the AI idea, which consolidates facial examining and trademark following, to conclude the individual's attitude after which they offer a modified playlist essentially founded absolutely on that. The feeling identification module is utilized to find the inclination communicated through the method of a method for the individual, making it imperative for the product to offer relaxation withinside the state of Music principally based absolutely on the individual's attitude. The product is parted into 3 areas: questionnaire, music recommendation, and mood recognition. Music recommendation is required because of how unique our choices and combinations are in terms of music preferences. When all of this is

considered, it is exceedingly difficult to generalize music and state that everyone would enjoy the same type. Music always has a unique link to our emotions. It is a way to connect people around the world through pure feelings. Depending on their current mood, everyone would want to listen to diverse categories of music.

Goals:

Our goal is to rightly combine the times with the human need for entertainment in the form of music.

We first learned about the emotions expressed by the user by neural network (ANN) to classify emotions.

The author also offers several approaches to playlists. Zheng et al.

2.3 Haarcascade technique – Model developed using haar cascade technique Nikhil et al. [3] Determining the users' state of mind through facial expressions. People often express their feelings through their facial expressions, and gestures but most people express their feelings through their faces. Emotion-based music player reduces time complexity for users, generally, people have tons of songs in their playlists. Playing random songs does not satisfy the user's mood. The system helps users to automatically play songs according to their mood. The user's image is captured by the webcam and the image is saved. The image is first converted from RGB format to binary format. This process of representing data is called a feature point detection method. This process can also be done using the haar cascade technique provided by open CV. The music player is developed using the java program. It manages the database and plays songs according to the mood of the user.

2.4 Automate the interaction - Parul Tambe et al [3] came up with an idea to automate the interaction between the user and the music player, knowing all the preferences, emotions and activities of the user and giving a selection of songs accordingly, the device records different facial expressions of the user to determine the mood of the user and thus predicting the genre of the music.

2.5 Brain-Computer interface – Chang Liu et al [4] describes a system using a brain-computer interface, also known as BCI. BCIs use devices to send signals to processing systems. EEG hardware is used to

monitor a person’s cognitive state. The downside of this scheme is that it constantly requires input from the user’s brain to perform the classification. Mid-based algorithms are used to continuously monitor, and process signals received from the user’s brain and use the signals to actively monitor and generate the emotions the user is currently experiencing. Swati Vadi et al [23] review EEG – Electroencephalography (EEG) is a form of medical science that records the electrical activity of brain cells and neurons. The electrical activity of neurons in brain cells is recorded. An approximation is made from the recorded neural activity, and a person’s emotion is estimated from this analysis. Electroencephalography (EEG) is a form of medical science that records the electrical activity of brain cells and neurons. The electrical activity of neurons in brain cells is recorded

III. PROPOSED SYSTEM

Implementation includes all conversion activities from the old system to the new system. The old system consists of manual operations that worked very differently from the proposed new system. A good implementation is fundamental to providing a reliable framework to meet the needs of the association. Incorrect settings can affect the results of the electronic framework.

Implementation steps:

1. Open anaconda
2. Select the project environment
3. Start spyder
4. Run the application app.py
5. Go to Microsoft edge and enter local host:5000
6. Click register and register
7. Using your registration email, please sign and complete the form existing on the next page.
8. Access the button (Sit up straight and put your face in the middle, otherwise it will appear, please look steadily)
9. After capturing the maximum sentiment, if the error is displayed on the next web page, we also have a questionnaire to know the exact sentiment.

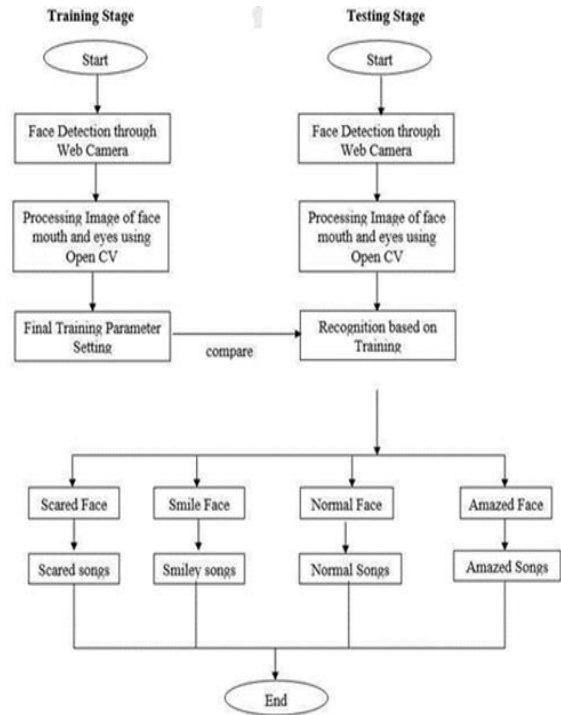


Figure 1: Flow Chart

IV. IMPLEMENTATION

Our project is made using the python programming language. Python provides compact and easy way to understand the code.

Python has a wide range of computational reasoning and AI Libraries like Kera’s, Tensor flow, and Scikit-learn. NumPy is used for recording advanced execution logic.

(a) Tensor flow – It contains a component that characterizes, improves, and builds numerical representations called complex numerical representations. It combines deep brain organization and programming support for artificial intelligence programs.

Tensor flow uses GPU graphics to automate maps.

(b)Pandas – Pandas is an open source library primarily designed to efficiently and intuitively process social or tagged information. It offers different designs and information activities to control a=mathematical information and time series. This library is based on the NumPy library. Pandas is fast, providing customers with high performance and efficiency.

(c) Spotify Implementation - The request authorization() task handles setting limits for approving claims and getting access tokens. The callAuthorizationApi() job sends a mail request to Spotify account management which returns an access token. This token is used for each request subsequently sent for confirmation. callApi() is used to send a request to Spotify account management to get data such as tracks in a playlist, each currently active device, and accessible audio items for a specific track.

(d) Open CV - Open CV is a huge library of open-source photo manipulation techniques. CV is the truncation condition of computing resources and volume of information in an open CV. For facial recognition, OpenCV currently consists of spic and span facial recognition classes. OpenCV is described as a branch of research that helps computer systems capture virtual photos and the structure of photos and videos.

(e) CNN (Convolutional Neural Network) - A convolutional network is a neural network (CNN), like an analog neural network (ANN), with a learnable load that can receive certain information. The Convolutional brain network recognizes the entire face as information and uses surface tuning data to remove reflections from the deeper face design. Different convolutional networks are integrated at each of the three layers to further improve accuracy and efficiency. Unlike humans see, PCs have an other method of seeing. They only exist in numbers. CNN consists of two parts - Secret layer and associative layer. They perform a series of convolution and aggregation tasks to identify items and associative layer will be populated as classifier.

(f) Emotion recognition - This interaction which involves the recognition of a person's emotions, is known as sensory recognition. One of the various advances in face localization that have been developed and expanded over a long period of time is sensory recognition. Today, facial recognition programs are used to make adjustments to verify and manipulate a person's appearance.

(g) Face extraction - The main phase of design recognition and information mining is data mining. At this stage, a subset of important elements is extracted

from the primary information using explicit guidelines. Large amounts of information can be reduced to smaller sets that are faster to compute. Therefore, qualified item selection is a fundamental step toward effective facial recognition.

V. RESULT

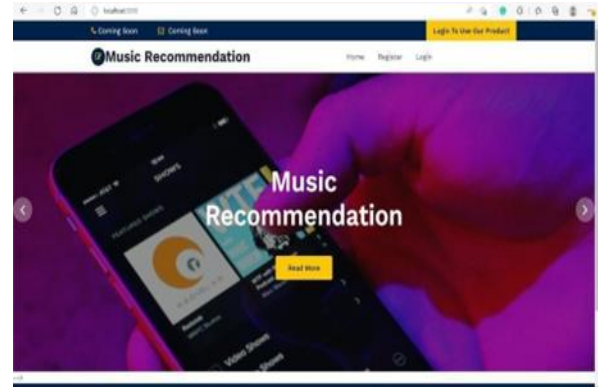


Figure 2: Home page

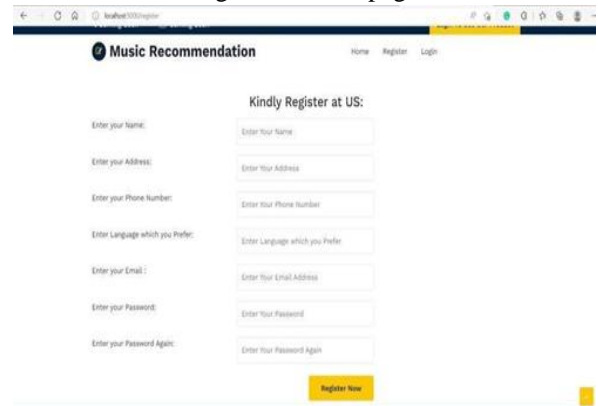


Figure 3: Registration page

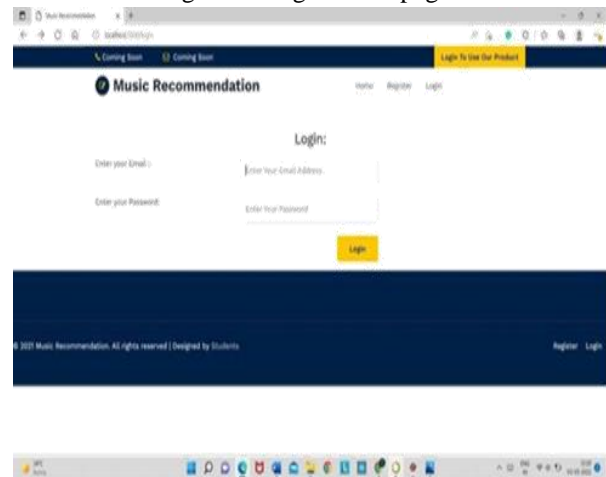


Figure 4: Login page

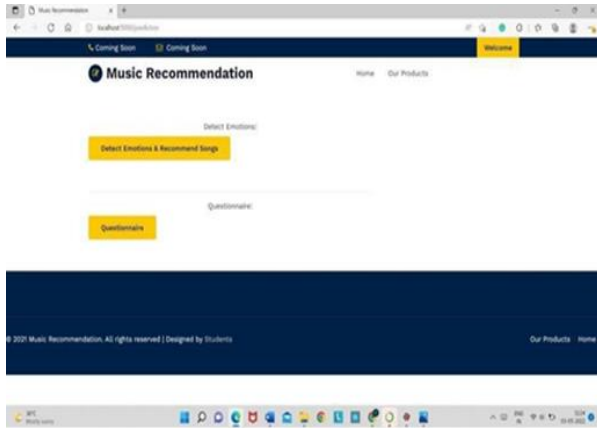


Figure 5: Models built

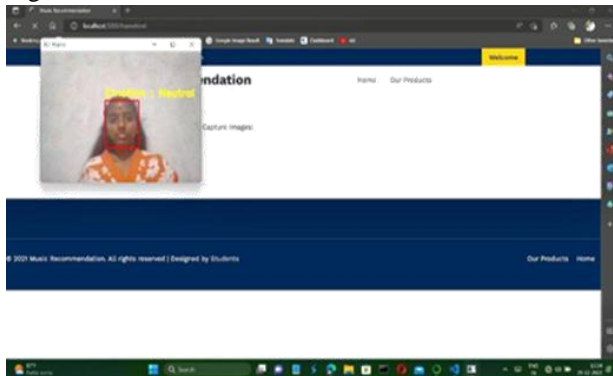


Figure 6: Detects emotion

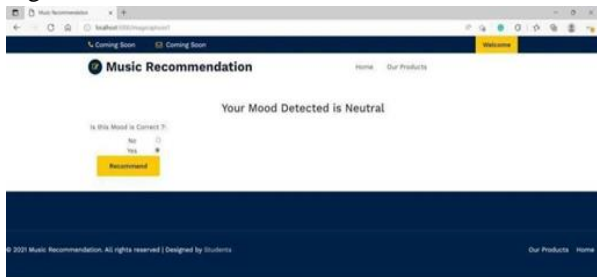


Figure 7: Verifies whether the detected emotion is correct or wrong.

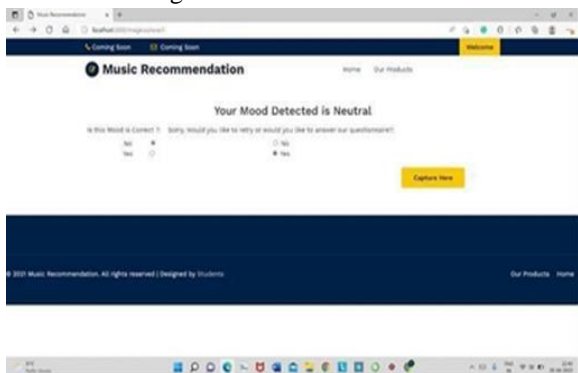


Figure 8: When we select yes it shows capture here option where you can again capture your facial emotion using the webcam

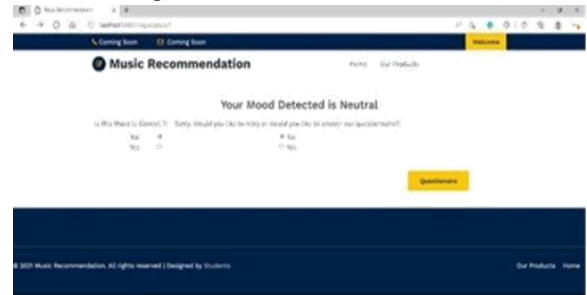


Figure 9: If you select no then it shows the questionnaire option



Figure 10: Here select the emotion you prefer and click on recommended option

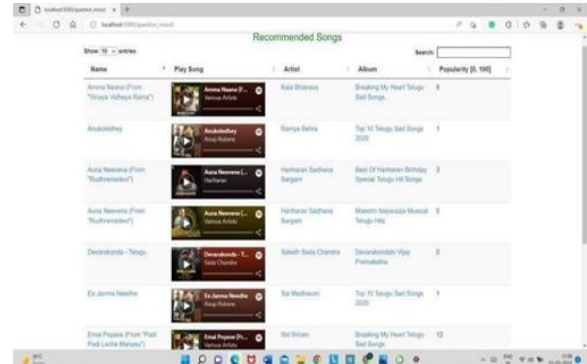


Figure 11: Recommends list of songs for emotion

VI. CONCLUSION AND FUTUE SCOPE

Manual facial exams used by therapists were instantly replaced by proper computer programming. The proposed framework basically processes videos of facial behavior, and then plays music based on those feelings. A basic framework for music recommendation using facial emotion recognition is

presented here. This recommends music by individual emotions like happiness, anger, sadness, and romance. Also, he can choose the music according to their state of mind. This website runs as a workspace where the user can access it anytime. The scope of the project can be expanded in the future to enhance its existing functionalities by expanding the model, implementing a more complex model to improve the performance and making the input in speech format and testing it on a live website.

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