

## Emotion Based Music Player

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**Abstract**— The human face plays a very important role in expressing a person’s emotion. Likewise, music is considered to be therapeutic and an inevitable mode of entertainment. Computer system with effective facial recognition algorithms can recognize the emotion and classify them into happy, sad, surprise, calm, angry, etc.,. We have developed an emotion based music player which works primarily based on these classifications. The Haar Cascade Classifier is used to classify these emotions based on user’s facial data. The songs are segregated accordingly and played to enhance the user’s mood. The user can also use the buttons (emojis) to select his/her mood. This project also deals with accounting functionalities and also provides mechanisms for privacy and security. This paper describes a very unique model which makes the facial recognition aspect more accurate than ever. Therefore, this application is developed in order to recognize the emotion of a person accurately and play a song based on the user’s mood.

**Keywords**— Haar Cascade Classifier, Emotion Recognition, Music Player, Machine Learning, Data Mining.

### I. INTRODUCTION

Generally, people have a large number of songs in their playlist but they often don’t listen to the right song based on their mood. There are various music players available with auto repeat, shuffle, fast forward, volume modulation, etc., but these features meet only the basic requirements of the user. To overcome these difficulties, we have come up with the emotion based music player (emo) to have complete human interaction with the player. The emotion based music player recognizes the facial features of the person and classifies using the haar cascade classifier. The emotion based music player is fully automated and considers user preferences to play the songs based on the person’s mood. The paper is organised as follows:

Section II deals with related work where we come across some interesting papers and articles that are published.

Section III explains the methodology used to implement this idea. In section IV, we take a look at the results obtained and some discussions on them. In section V, we conclude the complete paper in a nutshell and we also describe our future plans with the paper. Finally, we proceed to the acknowledgements and the list of references.

### II. RELATED WORK

[1] The paper by Hafeez Kabini Et Al suggested the problem of the existing methods to handle only deliberately displayed and exaggerated expressions of prototypical emotions despite

the fact that deliberate behavior differs in visual appearance, audio profile, and timing from spontaneously occurring behavior, by taking efforts to develop algorithms that can process naturally occurring human affective behavior have recently emerged. They also introduced and researched these recent information and discussed human emotion perception from a psychological perspective.

[2] Nikhil Zaware Et Al stated that it is a very time consuming and lengthy task to create and manage large playlists and to select songs from such playlists. In their paper, they stated a way to detect the mood of the user automatically and generate playlist of songs which is suitable for the user’s current mood. The photo is captured using a webcam and that photo is passed under various steps to detect the user’s mood/emotion.

[3] Setiawardhana Et Al in their technical paper stated that their model works by performing facial expression detection. This is done offline by taking images of a subject with nearest position from the camera where the face must not be tilted. The image is identified as a combination of color, and feature extraction is performed based on the location of the eyebrow, the eye, and the mouth.

[4] Anukri Dureha suggested manual segregation of a playlist and annotation of songs according to the current emotional state of a user, as a labour intensive and time consuming job. In our proposed system, we are implementing the emotion recognition algorithm by using the haar cascade classifier

which detects haar-like features and uses them to figure out the emotion of a particular user. This emotion will then be used to pick a song from the music database automatically. The efficiency of this system is meant to be very high.

### III. METHODOLOGY

The aim of this project is to build an emotion based music player that plays songs based on your current emotion or mood. In order to achieve this, the system has been split into 5 modules, namely: UI Design, Accounting, User Authentication, Music Player Module, and Core emotion Detection and Music Dispatcher subsystem. UI Design mainly deals with user interfaces throughout the project. The goals of our UI are to make it user-friendly, and really simplistic. The accounting module is implicit. We store the history of the most played songs, etc.. User authentication, as the name suggests, mainly deals with login and logout functions. It also takes care of creating an account in a very secure manner. The music player module comprises the front-end of the player and the back-end, which distributes the songs to the player. Our major focus will be regarding the core emotion detection and music dispatcher subsystem.

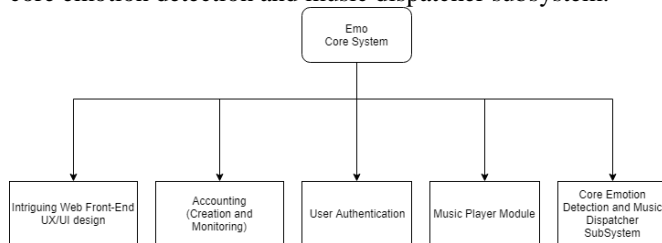


Fig-1: Emo Player core modules division.

Further dissecting the Core Emotion Detection and Music Dispatcher subsystem, we can observe a complicated process of emotion detection and music dispatch.

The sub system is designed in such a way that the input from the website's front end is the user's current mood or emotion and it is categorized into two parts: Selected Emoji and Scanned Image.

If the emoji is selected from an array of buttons, then a separate sequence of execution is performed. Similarly, if the face of the user is scanned to find emotions, the Static Facial Emotion Recognition process is applied to it, which in turn produces an emotion as the output.

Again, from both the execution paths, the output is the user's emotions. The user's emotion is passed to the counter emotion generation engine and it generates the counter emotion for that particular emotion. For example: If the user's emotion is "angry", then the counter emotion will be "calm".

This counter emotion so obtained will be run through a Music-Dispatcher process which fetches a suitable song based on the counter emotion. The fetched song and its details are returned to the Music-Dispatcher. Further, the Music-Dispatcher forwards this song to the client. This song is played by the Front-End music player.

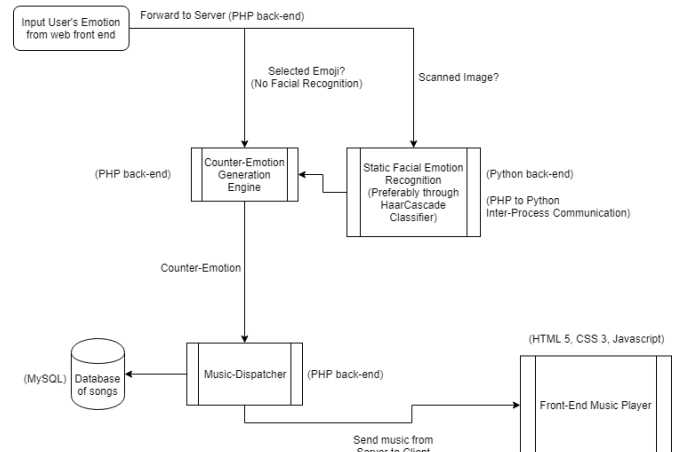


Fig-2: Block diagram of emotion detection and music dispatcher subsystem.

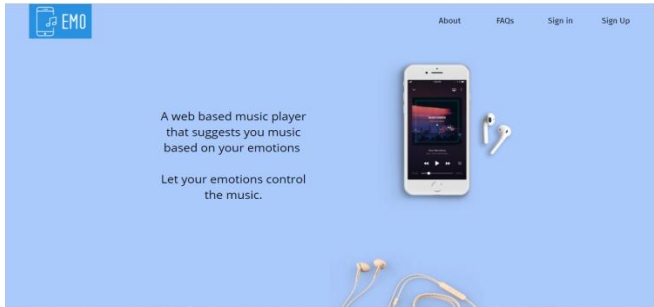
This process of fetching songs based on emotions is way more accurate compared to the Speech Emotion Recognition model which consisted of data mining techniques like Feature selection and Feature extraction after sensing audio signals.

The languages used for the front-end are HTML 5, CSS 3, and JavaScript whereas the languages used for the back-end are PHP 7.x, Python 3.x, and MySQL. This project utilizes an apache server to run the PHP back-end. The deployment part of the project can be taken care of by using the cloud. We can have a persistent cloud server that constantly provides this service.

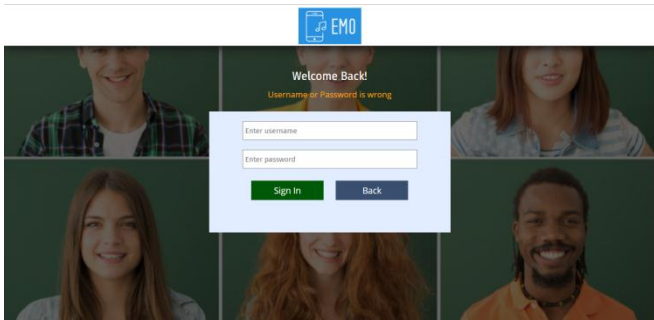
### IV. RESULTS AND DISCUSSION

We have done the project and it works perfectly. We have two ways to get to know a person's emotions: the first is by using the camera and an algorithm to analyze the emotions of the person, and the second one is that we added a small block with few emojis so that the person can click on the emoji that currently relates to them. As soon as they click on it, they'll get their required song playlist. This model runs well. The list will have songs that will be related to his current mood and then it will slowly transcend into songs that makes him/her feel better. We have an algorithm that gets the songs needed for the listener and aligns it in the exact precise order. Our aim is not only to create a playlist but also to enhance the listener and make him feel better. And generating a playlist

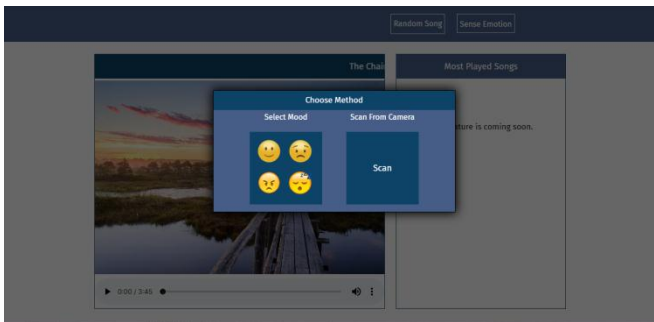
after analyzing the emotion's is done automatically. Here are a few screenshots from a working model



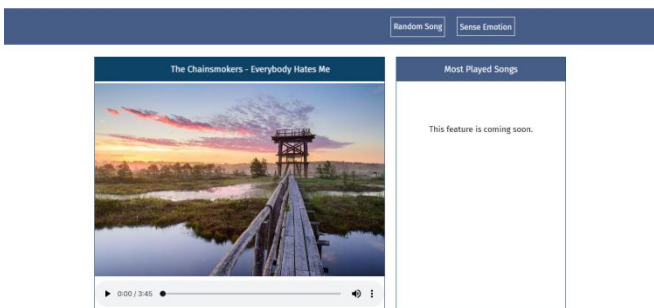
**Fig-3:** This is our landing and sign-up page where you can create your account easily and get to the music player.



**Fig-4:** This is our login page. Using this interface, an already registered user can login to the application.



**Fig-5:** This is a block of emojis where you select the required emotions to get your required playlist.



**Fig-6:** After finding your emotions by analysing the input emoji, it automatically gives you your playlist.

We don't just make the user listen to our selected songs. we start the application by asking the user to first give their preferred song that they like, irrespective of the language. We also track the frequency of how many times they listen to a song so that we can organise the playlist accordingly.

## V. CONCLUSION AND FUTURE SCOPE

Emotions are a key ingredient for a person's taste in music. Emotional quotient can be manipulated using music therapy and similar applications. In order to enhance this system, we have developed a pretty accurate emotion based music player which aims at counteracting a user's negative emotions by selecting appropriate songs based on the user's mood and several other parameters.

To further enhance the applications in this arena, we have plans, such as:

1. Optimize the algorithm used to classify and obtain counter emotions.
2. Add more parameters to the emotion recognition algorithm. (Like time of the day, season, whether the person has some serious illness)
3. Since many people don't really show their real emotions through their face, their subconscious mind can tell the true emotions. In order to exploit this vulnerability, we have plans to create a smart chatbot which can realize your true emotions by engaging in a conversation with you while you are already listening to some music.
4. Further analysis of this arena might be performed leading to better theories to support the area.
5. Automation of music dispatcher without having to manually sort out songs and store them in files and databases.

Hence, in a nutshell, emotions play a vital role in a person's taste in music and vice versa. The emotion based music player counteracts the user's negative emotions by selecting a counter emotion song from the database. It is pretty accurate. However, it does require some amount of improvisation.

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