A Mini Project Report on

Smart music with mood detection

TE - IT Engineering

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CERTIFICATE

This to certify that the Mini Project report on SMART MUSIC WITH MOOD DETECTION has been submitted by **21204012 Dhruvi Mahesh Haria**, **20104137 Hitesh Vasudev Sachdev**, **20104050 Aman Lalchand Yadav** who are a Bonafede students of A. P. Shah Institute of Technology, Thane, Mumbai, as a partial fulfilment of the requirement for the degree in **Information Technology**, during the academic year **2022-2023** in the satisfactory manner as per the curriculum laid down by University of Mumbai.

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ABSTRACT

Music is a therapy which heals an individual from any situation. Also, music is heard by people along

with their various activities. Music unites various generations together and makes us happy and we enjoy each and every moment of listening. In this world of music, now – a – days the number of available songs is too high for a single person to choose and listen to songs accordingly. Due to this, people sometimes feel it is difficult to choose from millions of songs. People find it a tedious job to hear music. For this problem our proposed system Smart music player using mood detection is capable of identifying or verifying a person's mood from image captured. Playing Music according to an individual's mood is a concept where People can hear music according to their current mood. Expressing various expressions/ emotions is something which defines an individual's mood. People also hear music to regulate their current mood. Our application will capture the facial image of a person which is further scanned, followed by the processing of the image to detect the mood of the person to display the songs to be played

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CHAPTER 1

INTRODUCTION

People's emotions and their expressions are visible on their face through which we can easily come to know about their mood. Often people tend to hear music in each and every situation, whether it may be happy, sad, good or bad. Music has been made available with various automatically generated playlists which recommend music to the user according to their previously heard songs. People enjoy listening to them but at the same time choosing music before listening to it is a tough one. Manually selecting songs even from a single playlist is a difficult job.

In this project, we are going to create a smart music player website which will detect the mood of a person and will display the list of songs to that person depending upon their mood. The mood detection will be done through some algorithm / technique with the help of Python language. Open-Source Computer Vision Library is a library of programming functions that focuses on real-time computer vision. The library is a cross-platform. Its main purpose is real-time image processing. If the native Intel performance primitives are installed on the system through self-optimized routines, library performance can be improved. This system will detect the user face and will give the suggestion according to the mood of the user. The face is divided into a smile, not a smile or a neutral one. According to emotion, music will be played. Users can change song details such as category and interest level at any time on the website.

The system will be capable of storing history data of every user in the system's database. This previous choice data of the users will then be used to accurately predict the future preference of songs using collaborative basis filtering and clustering algorithms. The system then generates albums and catalogs based on different sentiments of the user which includes the predicted songs for that particular user. Also, this project will have a simple UI which will be easy for any user.

CHAPTER 2

LITERATURE REVIEW

Sr. No.	Title	Author	Algorithm used & functions	Advantages	Disadvantages
1.	Smart music player based on emotion detection	Bharat Bharadwaj, Fakiha Amber, Varis Ali Khan	Haar Function	Increases its efficiency	Time consuming
2.	Emotion based smart music player	Bharat K.V. Chandan M.N.	Convolutional neural networks (CNN)	Better performance Good accuracy. Less complex	Same kind of source is played Manually search songs based on their mood

CHAPTER 3

PROPOSED SYSTEM

Now-a-days the number of available songs is too high for a person, even if listening to music for their relax mind. People sometimes feel it is difficult to choose one song as per their mood from a list of million songs. Smart music player using mood detection is a system capable of identifying or verifying a person's mood from an image captured. Website will capture the facial image of a person and is further scanned, recommends the song ass their mood. Music is categorized as a comfort which is very calm for heart and mind both.

Mood Detection Component: The system would include a mood detection component that utilizes advanced algorithms and machine learning techniques to analyze various inputs, such as the user's voice tone, facial expression, and biometric data, to determine their current emotional state.

Music Database: The system would have a comprehensive music database that includes songs from different genres and moods. The database would be regularly updated to include new songs and to remove outdated ones.

User Profile: The system would maintain a user profile that includes information such as the user's preferred genres, listening history, and mood patterns. The profile would be used to personalize the music recommendations and playlists.

Recommendation Engine: The system would have a recommendation engine that analyzes the user's mood and preferences to suggest songs and playlists that match their current emotional state. The recommendation engine would also suggest new songs based on the user's past listening habits.

Integration with Other Apps: The system would integrate with other apps on the user's device, such as fitness tracking apps, to adjust the music based on the user's physical activity and energy levels.

User Feedback: The system would gather user feedback on the recommended music to improve the accuracy of the mood detection and recommendation engine.

Sleep Mode: The system would include a sleep mode that plays calming music to help the user relax and fall asleep faster. The app can adjust the music based on the user's sleep patterns and provide feedback on how well they slept.

Voice Control: The system would have voice control capability, allowing the user to give voice commands to play specific songs, genres, or playlists.

Security: The system would have robust security measures in place to protect user data and prevent unauthorized access.

FEATURES & FUNCTIONALITY

Mood detection: The primary feature of smart music with mood detection is its ability to detect the user's mood using various inputs like voice tone analysis, facial recognition technology, and biometric sensors. It can analyze the user's current emotional state and select music that aligns with their mood.

Personalization: Smart music with mood detection can also personalize the music based on the user's listening history, preferred genres, and other factors. It can learn from the user's past music choices and create custom playlists that cater to their specific tastes.

Recommendations: Based on the user's mood, smart music with mood detection can recommend songs and playlists that match their current emotional state. It can also suggest new music that the user might enjoy based on their past listening habits and mood patterns.

Integration with other apps: Smart music with mood detection can integrate with other apps on the user's device, such as fitness tracking apps, to adjust the music based on the user's physical activity and energy levels.

Voice control: Smart music with mood detection can be controlled using voice commands. The user can simply say the name of the song or genre they want to listen to, and the app will play the appropriate music.

Sleep mode: Some smart music with mood detection apps also includes a sleep mode that plays calming music to help the user relax and fall asleep faster. The app can adjust the music based on the user's sleep patterns and provide feedback on how well they slept.

CHAPTER 4

REQUIREMENT ANALYSIS

1. Mood detection algorithm: The smart music system should have a reliable and accurate mood detection algorithm that can analyse various features of the music and identify the mood of the listener. This algorithm could be based on various techniques such as machine learning, signal processing, and data analysis.

2. Music library: The system should have a large and diverse library of music that includes different genres and moods. The library should be updated regularly to keep up with the latest music trends.

3. User interface: The user interface of the smart music system should be intuitive and easy to use. The user should be able to select their preferred mood or allow the system to detect their current mood automatically.

4. Music playback: The system should be able to play music in various formats, including streaming services and local music files.

5. Personalization: The smart music system should be able to personalize the music selection based on the user's preferences and listening history.

6. Compatibility: The system should be compatible with various devices, including smartphones, tablets, laptops, and smart speakers.

7. Security: The smart music system should be secure, with measures in place to protect the user's personal data and music preferences.

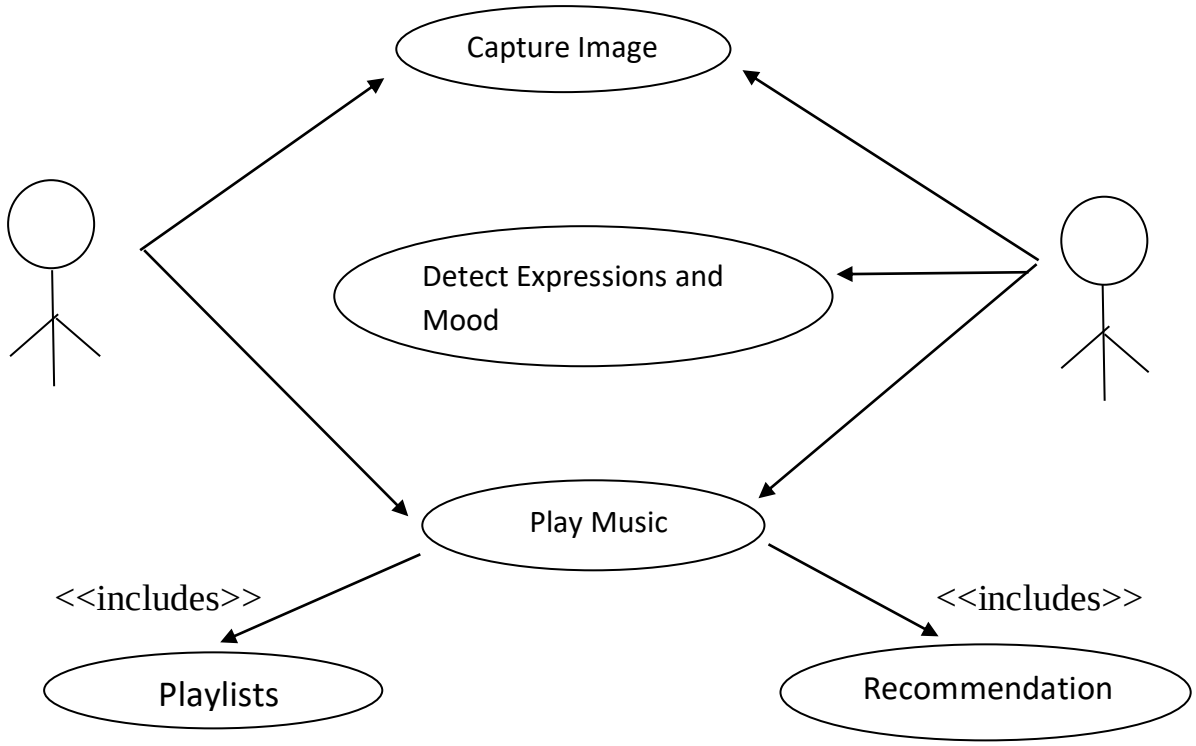
8. Accessibility: The system should be accessible to users with disabilities, with features such as text-to-speech and voice commands.

9. Performance: The system should be able to handle a large number of users and music requests without any performance issues.

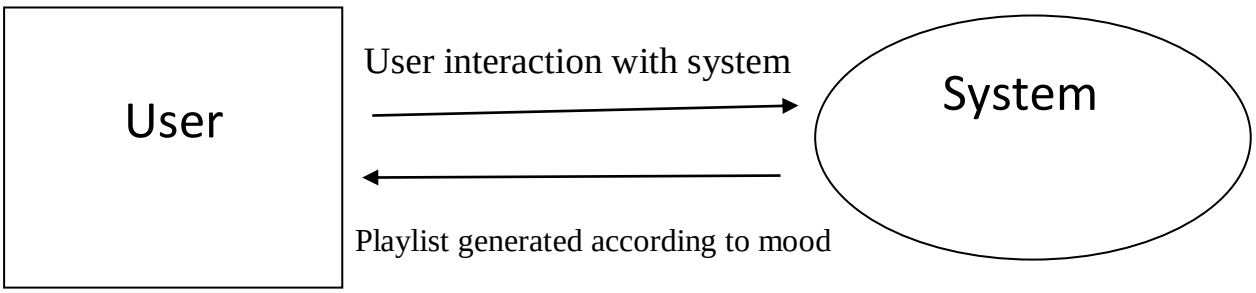
10. Integration: The system should be easily integrated with other software systems, such as music streaming services and social media platforms.

CHAPTER 5

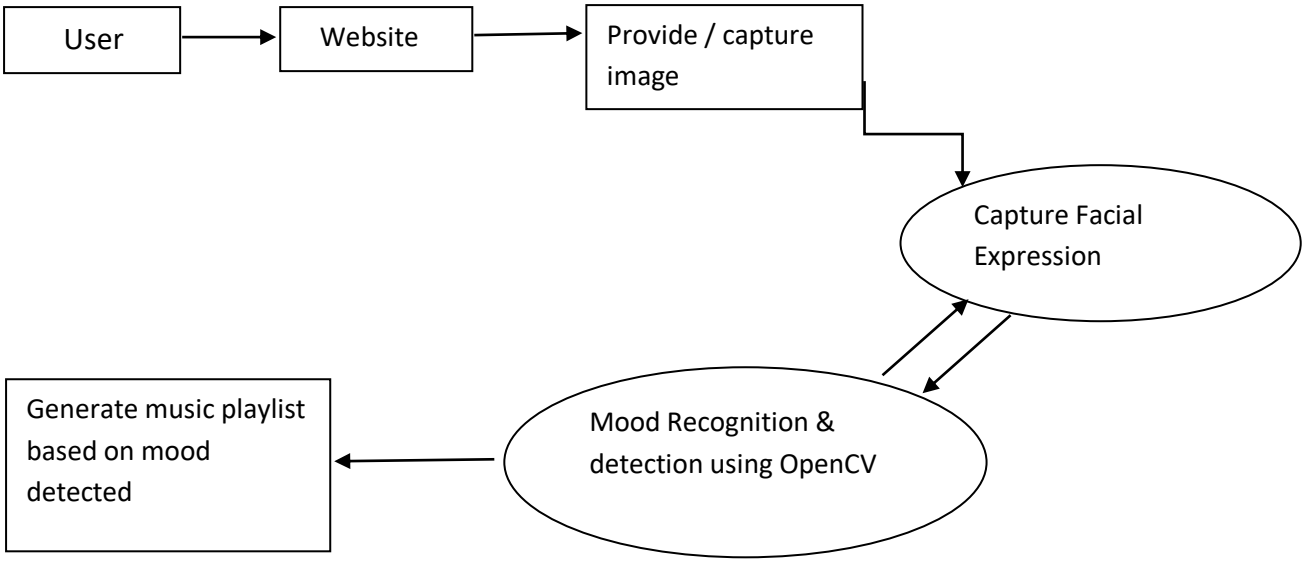
5.1 Use Case Diagram



5.2 DFD Diagram



DFD LEVEL 0


User
Website
Provide / capture image
Capture Facial Expression
Mood Recognition & detection using OpenCV
Generate music playlist based on mood detected

DFD LEVEL 1

CHAPTER 6

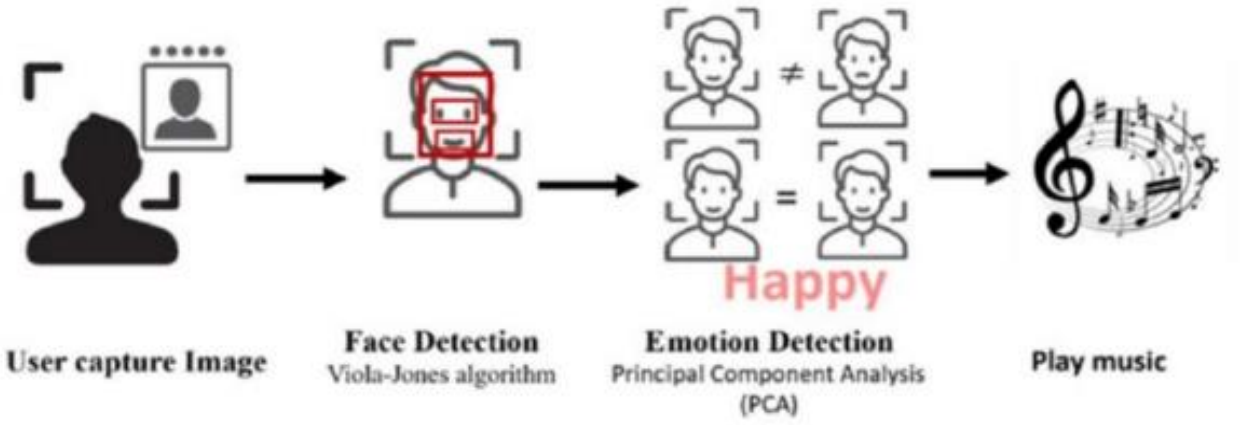
TECHNICAL SPECIFICATION

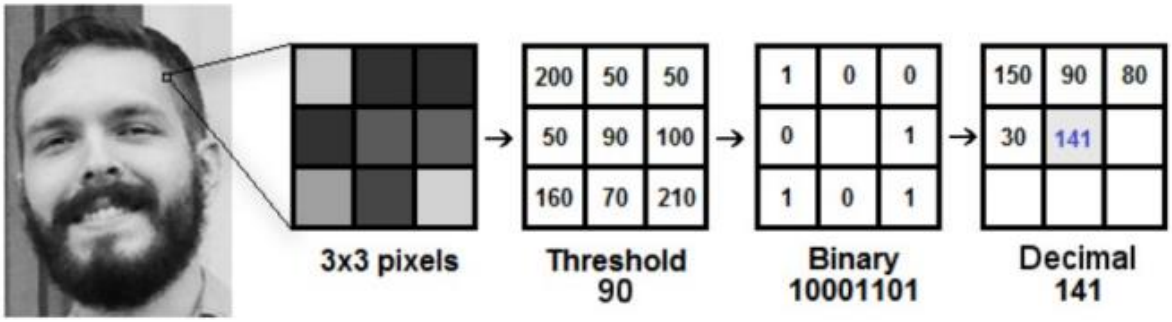
Sr. No.	Name of software	Specification	Quantity
1	Any OS	Windows 8 or above	1
2	Python	Python 3.7 or above	1
3	OpenCV	OpenCV 2 or above	1

FISHERFACE ALGORITHM

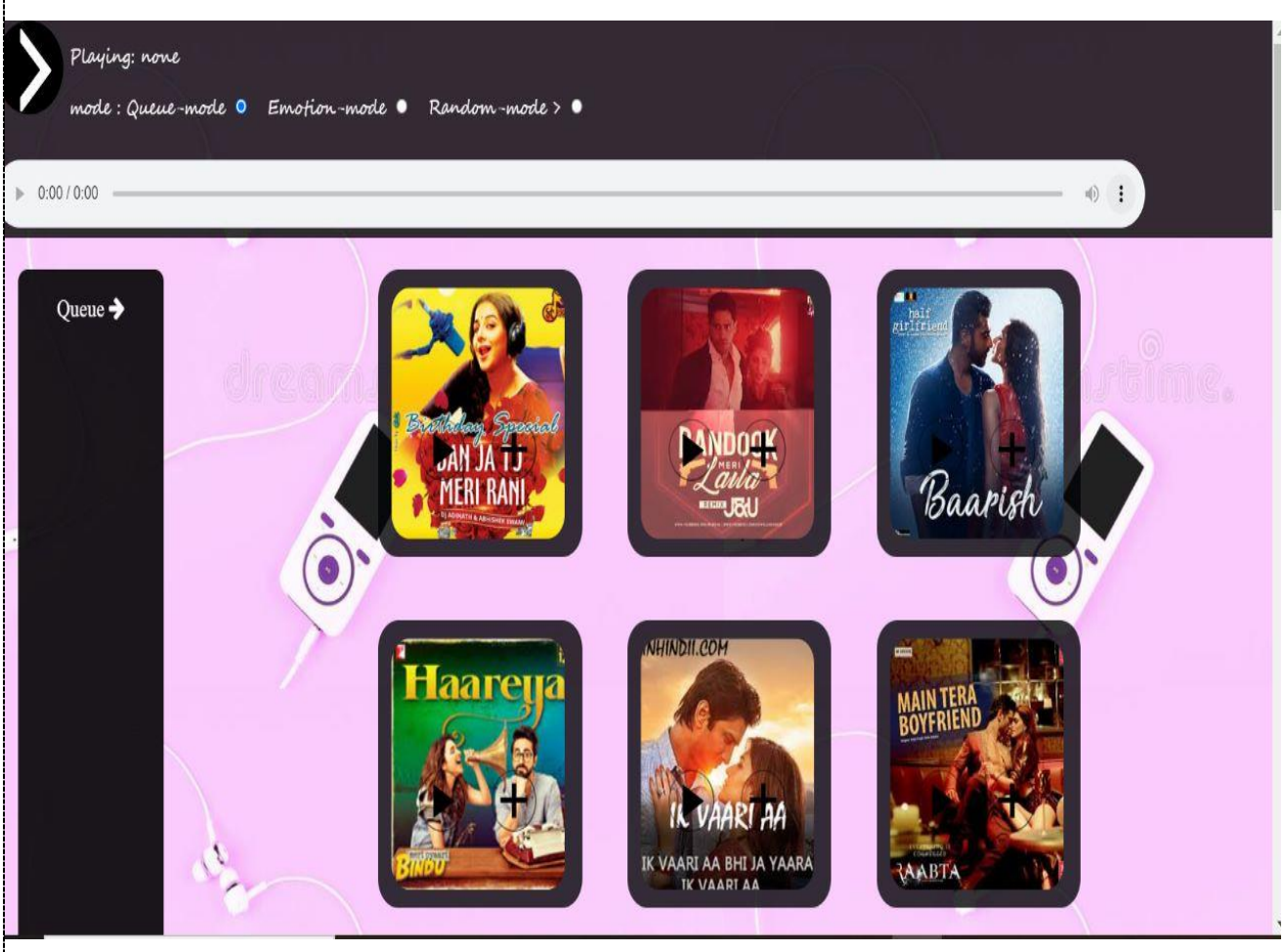
STEPS: -

1. Training images (RGB/gray scale)
2. Convert into gray scale
3. Detect face
4. Resize image
5. Predicted





Working of fisher face algorithm



CHAPTER 7

CONCLUSION

Incorporating mood detection technology into smart music systems has great potential for enhancing the listening experience of users. By analyzing various cues such as tempo, pitch, and rhythm, smart music systems can accurately identify the mood of a song and recommend tracks that match the listener's current emotional state. This technology can also be used in various industries such as fitness, therapy, and retail to create personalized experiences that cater to individual moods and preferences. However, the accuracy of mood detection algorithms needs to be improved further, and user privacy concerns should also be addressed. Overall, smart music systems with mood detection have a promising future and can revolutionize the way we listen to music. The development of smart music systems with emotion detection capabilities has the potential to revolutionize the music industry and improve the listening experience for users. By using advanced algorithms and machine learning techniques, smart music systems can analyze various cues such as facial expressions, heart rate, and voice tone to accurately identify the emotions of a listener. This technology can also be used in various industries such as healthcare, education, and entertainment to create personalized experiences that cater to individual emotions and preferences. However, there are challenges that need to be addressed, such as the accuracy of emotion detection algorithms, user privacy concerns, and the need for more extensive research to understand the relationship between music and emotions better. Overall, the development of smart music systems with emotion detection capabilities represents an exciting and promising area of research with a wide range of potential applications.

CHAPTER 8

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