A PROJECT REPORT ON

EMOTION BASED MUSIC PLAYER: BINDAAS SUN

SUBMITTED TO
THE CUMMINS COLLEGE OF ENGINEERING FOR WOMEN,
KARVENAGAR, PUNE
(An autonomous institute affiliated to Savitribai Phule Pune university),
IN THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE AWARD OF THE DEGREE
OF

BACHELOR OF TECHNOLOGY
(COMPUTER ENGINEERING)

SUBMITTED BY

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CERTIFICATE

This is to certify that the project report entitled,

"EMOTION BASED MUSIC PLAYER: BINDAAS SUN"

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ABSTRACT

Nowadays, people tend to increasingly have more stress thanks to the bad economy, high living expenses, etc. being attentive to music may be a key activity that assists to scale back stress. Music plays an awfully important role in human's lifestyle. Usually, the user needs to face the task of manually browsing through the playlist of songs to pick out. it's going to be impractical if the music doesn't suit the current emotion of the listener. Furthermore, there's no music player which is ready to pick out songs that support the user emotion.

Here we are proposing an efficient and accurate model, that may generate a playlist supported current spirit and behavior of the user. To overcome this problem, we propose an emotion-based music player, which can suggest songs supported the user's emotions; happy, anger, sad, disgust, fear, neutral.

The Emotion Based Music Player is employed to automate and provides a best music player experience for user. Application solves all the essential needs of musiclisteners without troubling them as existing applications do. It uses technology to extend the interaction of the system with the user in numerous ways. It makes the work of the user easy by capturing the image using phone’s camera, detecting their emotion, and suggesting a customized playlist with advanced features. The most important goal is to create change the mood of a person if it's a negative one like sadness, depression. The negative or bad thoughts of the user are slowly converted to positive thoughts by changing the song from a low tone to an excited tone.

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ABBREVIATION	ILLUSTRATION
FER	Face Recognition Library
CNN	Convolutional Neural Network
DFD	Data Flow Diagram
ER	Entity Relationship

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Chapter 1. INTRODUCTION

1.1 MOTIVATION:

When they have hundreds of songs downloaded on their smartphone, music users find it tough to manually create and separate their play lists. It's also tough to keep track of everything because some songs are added but never played, wasting a lot of device memory and causing the user to actively seek and delete tracks. Each time, users must actively choose songs based on their interests and mood. It's also tough to reorganise and play music as users' playstyles change.

Music is now structured in an existing application using playlists and various moods. When the user selects their current type of mood it might happen that they don't like the play – list created by the developer Because the developer is simultaneously acting as the user, it's difficult to say what kind of play-list the user would want. Everyone has their own choice about them, contrast colour. This also becomes the need to provide choices about them dark, light, colourful.

As a music lover We thought to give an effort less music player like speech to play music, mood wise automatic music play and more impressive function. A music player should be built in such a manner which satisfies user with excellent Sound quality and there are numerous options for enhancing bass. Many people like high bass, live, Custom, Rock Jazz, Electronic and many more types of sound mode effects as a result, providing all in equalise is a difficult task.

1.2 PROBLEM DEFINITION & OBJECTIVES:

Using existing music players, a user had to carefully browse through his playlist and select songs that would improve his mood and emotional experience. Various music players have been developed in today's world, with ever increasing advancements in the fields of multimedia and technology, with features such as fast forward, reverse, variable playback speed, Local playback, streaming playback with multicast streams, volume modulation, genre classification, and other features.

Despite the fact that these features meet the user's basic needs, the user must still manually scroll through the song playlist and select songs based on his mood and behaviour. That is the want and need of a user who, on occasion, has felt the need and desire to browse through his playlist based on his mood and emotions.

Our system's main goal is to change or sustain the user's emotional state by displaying a playlist of music based on that feeling.

1.3 PROJECT SCOPE & LIMITATIONS:

- Emotion based music player contains a major feature of real time video processing. In this the user will be monitored every time by the application and it will send a popup notification if the user wants to enhance themself by playing their current mood wise/ emotion-based music.
- Songs also can be played not only by their face or mood capturing but also by using emojis. Here there will be a default playlist based on moods such as happy, anger, sad, disgust, fear, neutral.
- Apart from this, users will be able to create their own customised playlist as well. They can also update their own customised playlists by adding/ deleting/ updating songs.
- Users can even control music such as play/pause, play previous/next song.
- They will be able to watch the video of the song on YouTube which is being played by the application.
- There will also be a popup dialogue box which will ask users if they want to hear a positive song to cheer them up and their mood or negative song based on their emotion accordingly.
- The user can also share the song to their friends if they want. Web app will be displaying the playlist after the picture is captured and motion is detected.

1.4 METHODOLOGIES OF PROBLEM SOLVING:

- In our Emotion based music player, the real time facial expressional emotions are recognized using a deep learning method CNN: Convolutional Neural Network algorithm using the real-time facial expressions of the user.
- For the recommendation of songs, we have used machine learning method known as KNN: Kth Nearest Neighbour algorithm.

Chapter 2. LITERATURE SURVEY

2.1 BACKGROUND OF DOMAIN:

(A) Deep Learning:

It is a one of the machine learning techniques that trains computers to learn by mimicking human behaviour. It's an area of computer science that lets computers learn without having to be explicitly programmed. The beauty of machine learning is that you can use models to learn how to differentiate instead of depending on human judgement. The following is a big overview of the basic steps that lead to deep learning and will explain you how it works:

1. Data collection
2. Getting the data ready
3. Model selection
4. Education 5. Evaluation
6. Parameter tweaking with hyper parameters
7. Foresight.

(B) Real Time Video Processing:

Video processing is a sort of signal processing that employs video filters and uses video files or video streams as input and output signals. It's a method of enhancing or extracting useful info from a video by applying and executing various operations on it. It's a group of signal processing techniques in which a video serves as the input and the output is either the video or its characteristics/features.

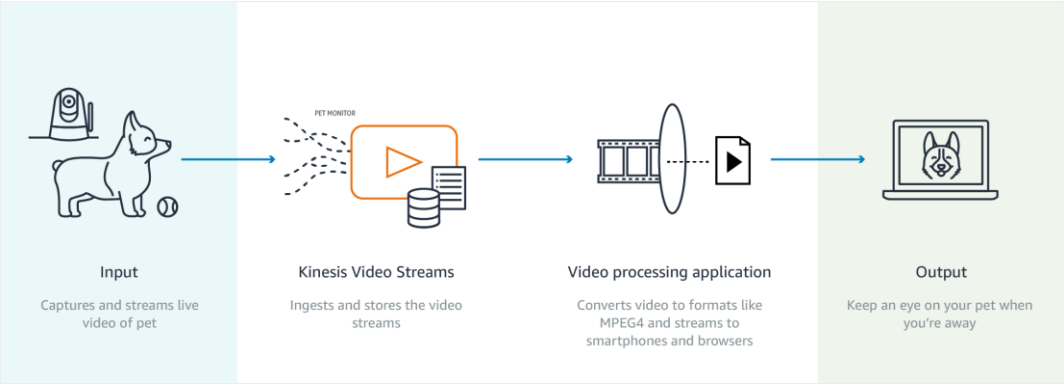


Fig- 2.1 Video Processing Pipeline

(Source: https://d1.awsstatic.com/diagrams/product-page-diagrams/diagram-kinesis-video-streams-pet-monitor-use-case.0d9f2e310ca6bf9d1c716796867ecc6fdac816f1.png)

2.2 COMPARISONS, RESEARCH PAPER STUDIED/PRODUCTS COMPARED:

Table- 2.2 Literature Survey

Reference	Authors & Year published	Techniques	Summary
Real Time Emotion Based Music Player Using CNN Architectures	Sulaiman Muhammad, Safeer Ahmed, Dinesh Naik, April 2021	Convolutional neural networks (CNN) models: a five-layer model and a global average pooling (GAP) model, FER2013 dataset.	In this paper, the use of an emotion recognition model to select music based on one's mood is proposed. Our effort strives to attain the maximum level of accuracy while maintaining the ability to apply to a real-world event in real time.
Emotion based music player	Krittrin Chankuptarat, Raphatsak Sriwatanaworachai, Supannada Chotipant, June 2019	Android Application development, SVM	This paper proposes a music player that is based on emotions and is available as an Android app The app's goal is to recommend songs based on the emotions of the users. The user's heart rate and facial image are assessed based on the heart rate ranges and Face API, respectively, to classify the emotion.
Group based emotion recognition from video sequence with hybrid optimization based recurrent fuzzy neural network	Velagapudi Sreenivas, Varsha Namdeo, E. Vijay Kumar 2020	Recurrent Fuzzy Neural Network (RFNN), Viola-Jones Algorithm	In this paper, the implementation of GER with hybrid optimization based on recurrent fuzzy neural network from video sequence is proposed in this research. Multivariate Local Texture Pattern is used to extract features, and features are chosen using an optimization approach.

Chapter 3. SOFTWARE REQUIREMENT SPECIFICATION

3.1 DESCRIPTION OF REQUIREMENT:

Emotion based music player is a real time solution to realise our stress by automatically playing the songs based on our current mood. Whenever a user is feeling low or in any mood, they can take advantage of this application. People can also visit our website and browse our features and if they like it, they have to create an account to take further benefits. With this application your mood will be refreshed and you will definitely feel relaxed.

3.2 SRS (SYSTEM REQUIREMENT SPECIFICATION):

3.2.1 FEATURES:

- Registration for new users Registration for new users & login for existing users.
- There is a real time camera/webcam that is capturing an image & a real time video and then it's being processed for extracting the facial expressions to detect the emotion. After that, it will display the mood wise playlist to user & automatically start playing the first song from the playlist that user can change if he/she wants to.
- We will be providing the Search option, so that user can manually search any song & can play it.
- User can also add their song to Favourites, so that he/she can listen to it at any time without wasting any time in searching for it.
- User will also be provided with the YouTube link, if he/she wants to watch the video of that particular song.
- Using emojis (Happy, Anger, Sad, Disgust, Fear & Neutral) to play the mood-wise songs.
- User will be provided with two options Positive & Negative to play the songs.
- Recommendation of songs using the previous history of users.
- User can create his/her customized playlists of songs.

3.2.2 FUNCTIONAL REQUIREMENTS:

1. Login-

   INPUT: User ID & Password

   OUTPUT: Personalized Home page will be displayed.

   PRECONDITION: User should be registered user.

2. Register-

   INPUT: Personal Information

   OUTPUT: Unique user ID is given & details are recorded at

administrator's end.
PRECONDITION: User should be new user with unique details.

3. Browsing-
   INPUT: Click on the button/tab/link to which service belongs.
   OUTPUT: Service webpage should get viewed.
   PRECONDITION: The link page should present in the database.

4. Search for Songs-
   INPUT: Click on the search button/tab/link & enter the song name which you want to search for.
   OUTPUT: Song details will be displayed.
   PRECONDITION: The song should present in the database.

5. Add Songs to Favourites-
   INPUT: Click on the Favourite's button/tab/link of the song which you want to add in favourites.
   OUTPUT: Song will be added in Favourite's list.

6. Play Video of songs using YouTube links-
   INPUT: Click on the YouTube's button/tab/link of the song which you want to watch a video for.
   OUTPUT: User will be redirected to YouTube & song will be played.

7. Make customized playlists-
   INPUT: Name of the new playlist.
   OUTPUT: Playlist is created & now user can add songs to it.
   PRECONDITION: Playlist name should be unique.

8. Select Emojis to play songs-
   INPUT: Choose 1 emoji from the list of emojis.
   OUTPUT: Playlist will be displayed for that emoji & first song from the playlist will be played.

9. Select Positive or Negative option-
   INPUT: Choose either Positive or Negative option when displayed.
   OUTPUT: Playlist will be displayed according to the option selected & first song from the playlist will be played.

10. View Account Information-
   INPUT: Click on the My Profile button/tab/link.
   OUTPUT: Account Information webpage should get viewed.
   PRECONDITION: The webpage should present in the database.

11. Share songs-

INPUT: Click on the Share button/tab/link of the song which you want to share & select the medium (WhatsApp, Facebook, Instagram etc.) to which you want to share.

OUTPUT: Song details with a link will get shared.

12. Control music (Play, Pause, Repeat, Shuffle)-

INPUT: Click on the Play/Pause/Repeat/Shuffle button/tab/link/icon.

OUTPUT: Whichever action/task is selected gets performed by the system.

13. Capture Image/Video-

INPUT: User's Face.

OUTPUT: Image/ video will be captured.

PRECONDITION: Camera/Webcam should be there to capture image/video.

14. Detect Emotion-

INPUT: Captured Image.

OUTPUT: Expressions are analysed & emotion is detected.

15. Display mood wise Playlists-

INPUT: Detected Emotion.

OUTPUT: Playlist will be displayed according to the current mood of the user.

16. Play 1st song from the displayed playlist-

INPUT: Displayed Playlist.

OUTPUT: A very 1st song from the playlist will get played automatically.

3.2.3 EXTERNAL INTERFACE REQUIREMENTS:

3.2.4.1 User Interfaces:

There are 4 different ways of users to interact with the application/system-

1. Viewers (Unknown Persons who visit site)
2. New Users (Who are ready to start with online)
3. Existing Users (Who are already using online)
4. Administrator (Main role, maintains the database & permissions)

3.2.4.2 Hardware Interfaces:

1. Laptop/Desktop PC:
    - core i3 & above processor
    - 8GB RAM
    - 500GB HDD

    Purpose of this pc is to show the mood-wise playlists, show songs with their details & multiple facilities as requested by the user.

2. Wi-Fi Router:
    Wi-Fi router is used for internet connectivity and data transmission from PCs to servers, a Wi-Fi router is necessary.

3. Speakers:
    Speakers are required because they help user to hear songs with much more precision than listening with headphones.

4. Desktop Camera/ Webcam:
    Camera is required to capture the real time video/ image of the user to extract their facial expression so that their current mood/emotion is detected.

3.2.4.3 Software Interfaces:

1. Client Side:

    - Microsoft/ Linux OS
    - Browser: Chrome
    - Camera: Minimum 16 Megapixel
    - Speaker
    - RAM: 4 GB RAM.
    - Space Required: 8 GB

2. Server Side:

    - Microsoft/ Linux OS
    - Tomcat Server
    - Browser: Chrome
    - Speaker
    - RAM: 4 GB RAM.
    - Space Required: 8 GB

3.2.4 NON-FUNCTIONAL REQUIREMENTS:

3.2.5.1 Performance Requirements:

The system shall be built upon an internet connection of the server, simultaneous access to the system is expected. The processor must be capable of handle real time functionalities activated by defined users & communication medium. All failures reported must be handled instantaneously for users' safety.

- Time for registration & login should be less than 10 seconds.
- The system should support 100 users at a time.
- The UI screen should respond in 5 seconds.
- The system should give response in 1 seconds after checking users request.

3.2.5.2 Safety & Security Requirements:

- Registered users can access their own accounts only.
- Authorized users can have access to their accounts.
- Only admin can have access to records of all the users.
- All the administrative and data entry operators have unique logins so system can understand who is login in to system right now no intruders allowed except system administrative nobody cannot change record and valuable data.

3.2.5.3 Software Quality Attributes:

1. Usability-

   Website application/system can be used again and again without distortion. The users of the system are the members & the administrator who maintains the system. As Compared to users, administrator will have more knowledge of internet of systems & rectify all the problems in the system.

2. Reliability-

   The system is safety critical. The emergency behaviour shall not occur without reasons.

3. Availability-

   The system shall be available all the time.

   - In normal mode, request by a user for a service should be handled within 1 Second.
   - When in load operating conditions, the system should be available 100% for the user.

4. Adaptability-

The system should be designed to be adaptable to the subsequent Web interfaces.

3.2.5 SYSTEM REQUIREMENTS:

3.2.6.1 Database Requirements:

MongoDB database is used as the datastore, which will store login details for user authentications & playlists created with multiple songs along with their details.

3.2.6.2 Software Requirements:

a. Operating System: Windows, Linux
b. Browser: Chrome, Mozilla Firefox, Microsoft Edge
c. Microsoft platforms access is also required.

3.2.6.3 Hardware Requirements:

a. Processor: Intel Core i3 & above.
b. RAM: 8 GB.
c. Space Required: 4 GB
d. Minimum 12 Megapixel (MP) Resolution camera (for testing on android device)
e. Minimum 8 Megapixel (MP) Resolution Webcam (for testing on laptop/desktop)
f. Speakers

3.3 ANALYSIS MODELS- SDLC MODEL TO BE APPLIED: ITERATIVE MODEL

We used the SDLC Iterative Model for the development. You can start with some software specifications and develop the initial version of the software using this methodology. A fresh iteration is used to develop a new version of the software if the software needs to be changed after the previous release. Each iteration of the Iterative Model is completed in a precise and set time frame.

The Iterative Model allows you to look back at prior phases and observe how changes were made. At the end of the Software Development Life Cycle (SDLC) procedure, the project's ultimate outcome was renewed.

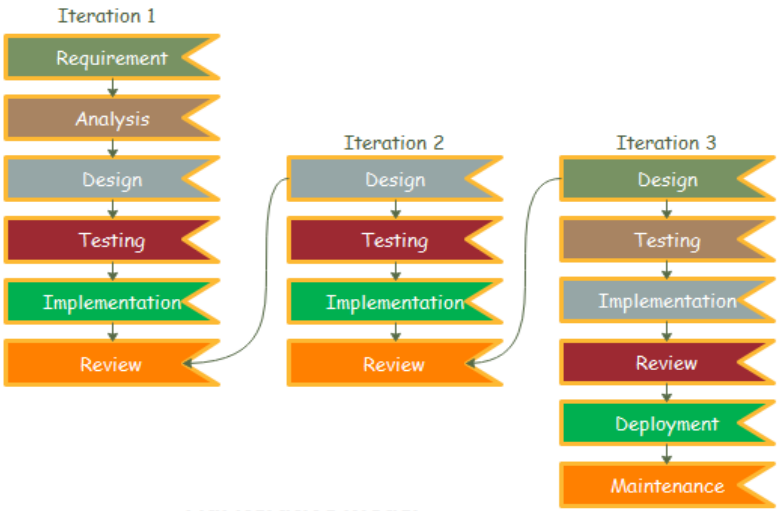


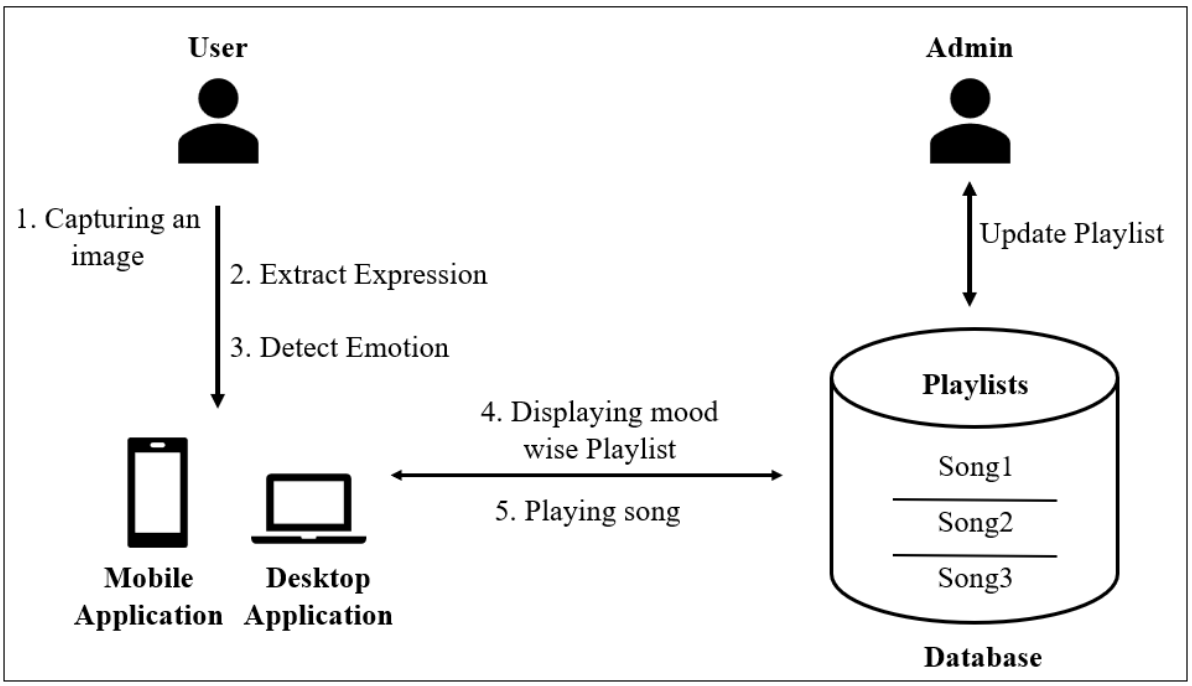
Fig- 3.3 Iterative Model of SDLC
(Source: https://static.javatpoint.com/tutorial/software-engineering/images/software-engineering-iterative-model.png)

We have used this model for the following reasons:

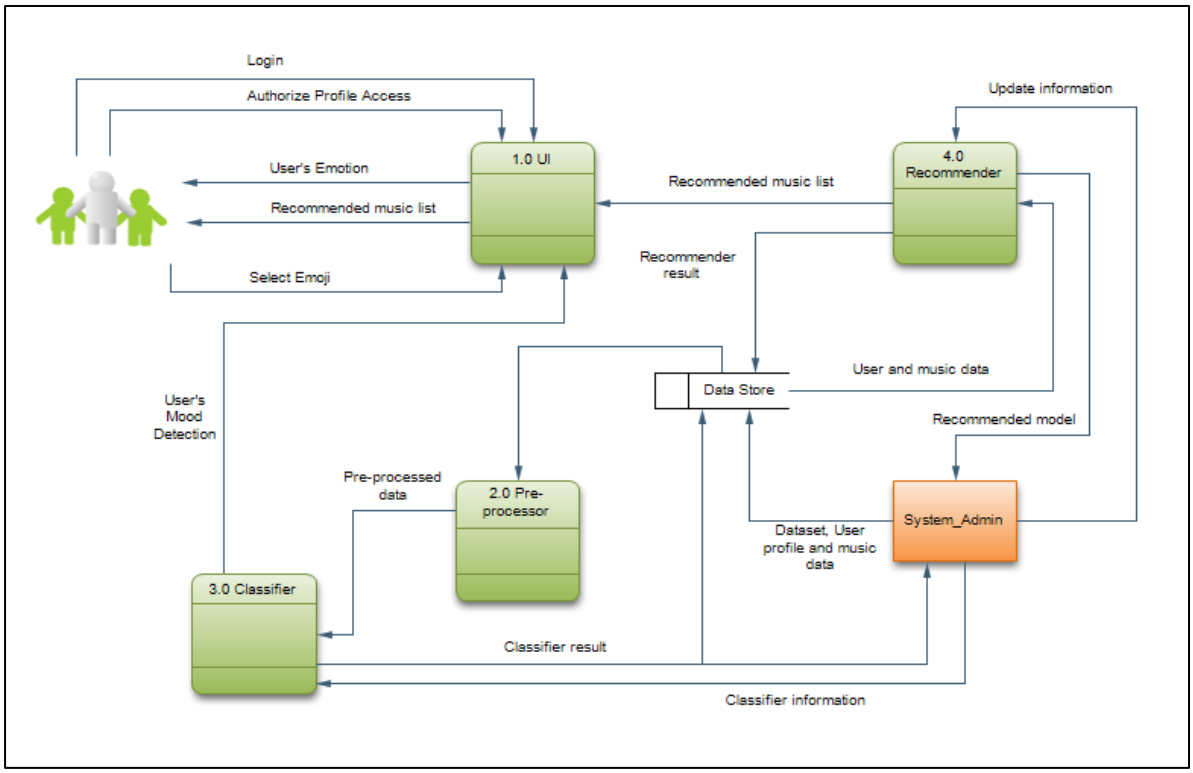
i. Our requirements are defined & ready in a clear and understandable manner.
ii. The project that we have developed is a massive software programme.
iii. Our project is open for the demands for future modifications.
iv. Because of this model, Parallel development of different modules is possible.

Chapter 4. SYSTEM DESIGN

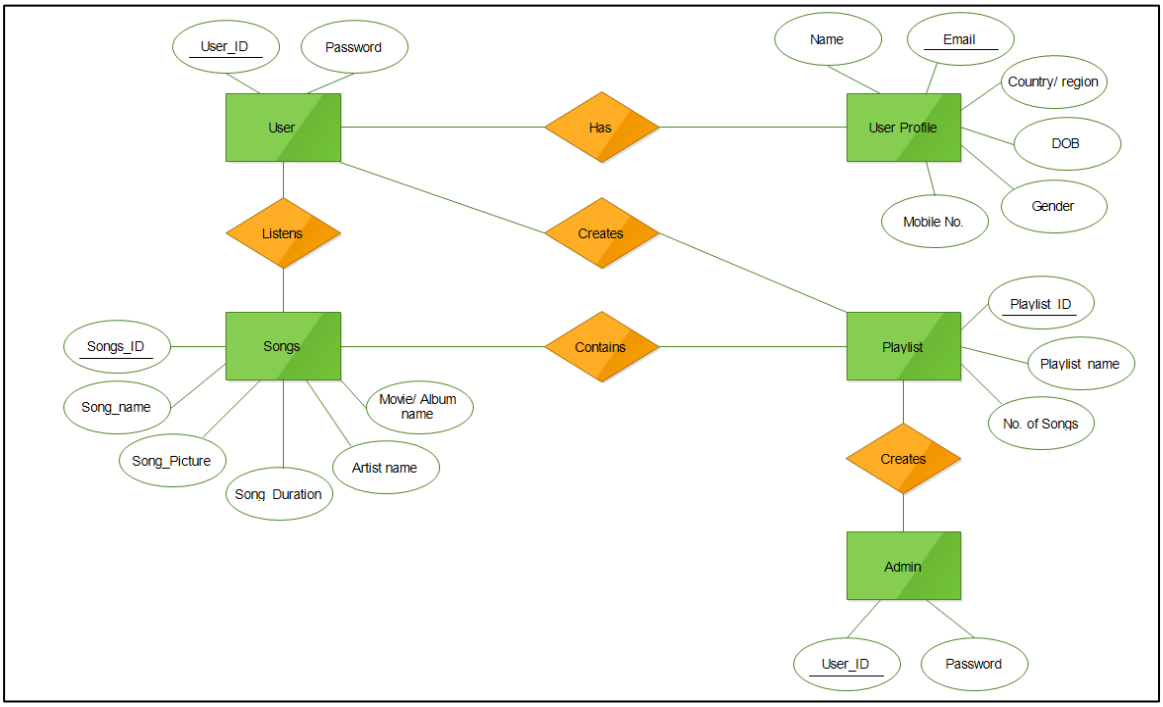
4.1 SYSTEM ARCHITECTURE:



4.2 DATA FLOW DIAGRAM:

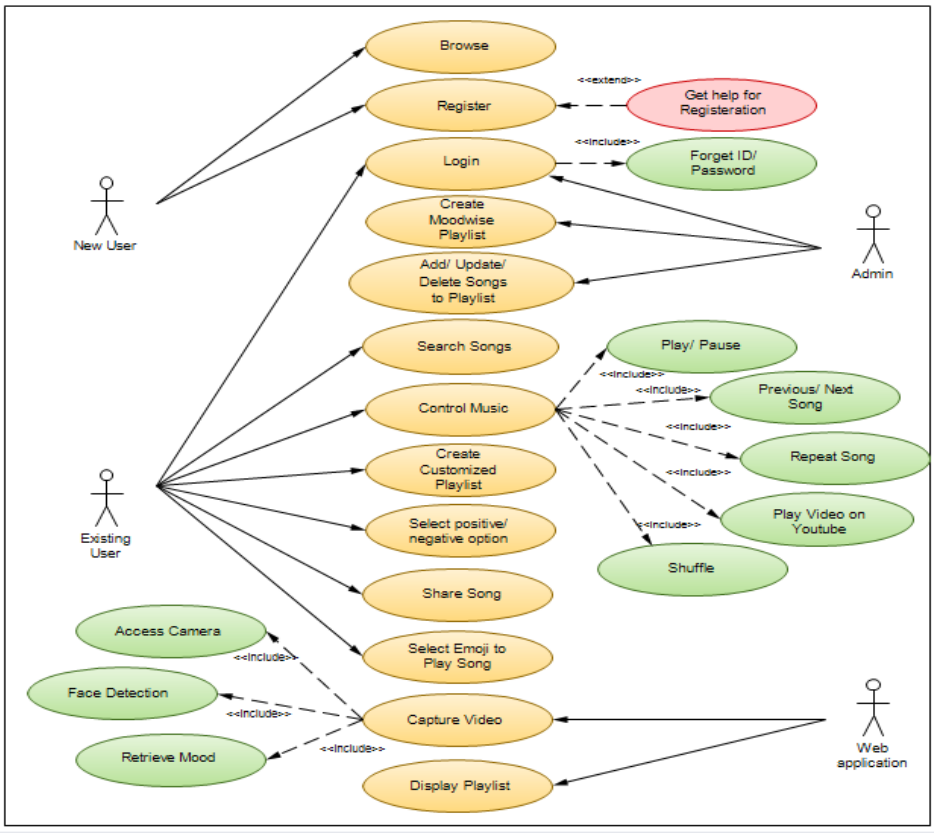


4.3 ENTITY RELATIONSHIP DIAGRAMS:

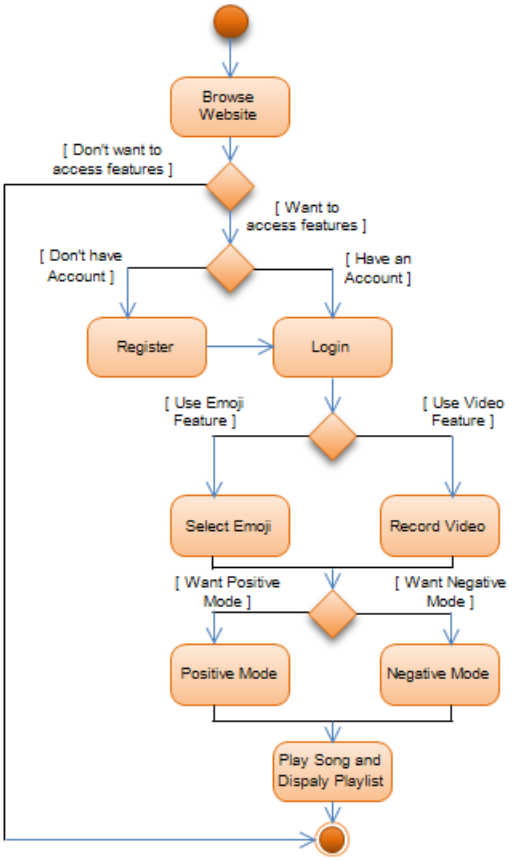


4.4 UML DIAGRAMS:

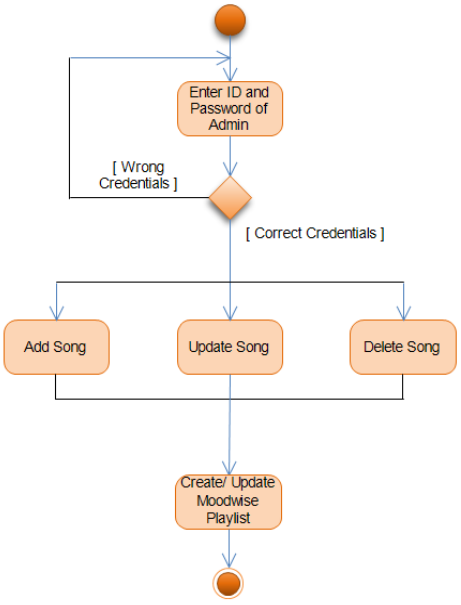
4.4.1 Use Case Diagram:



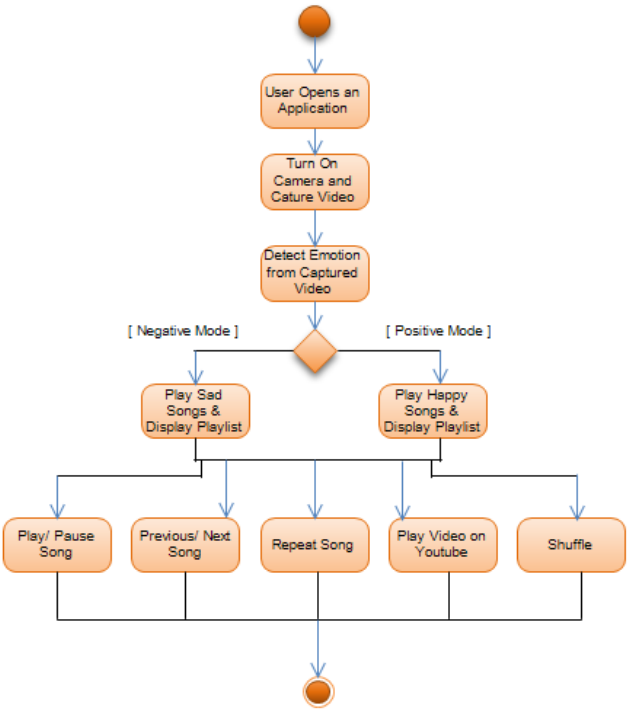
4.4.2 Activity Diagram:



(Activity: User)

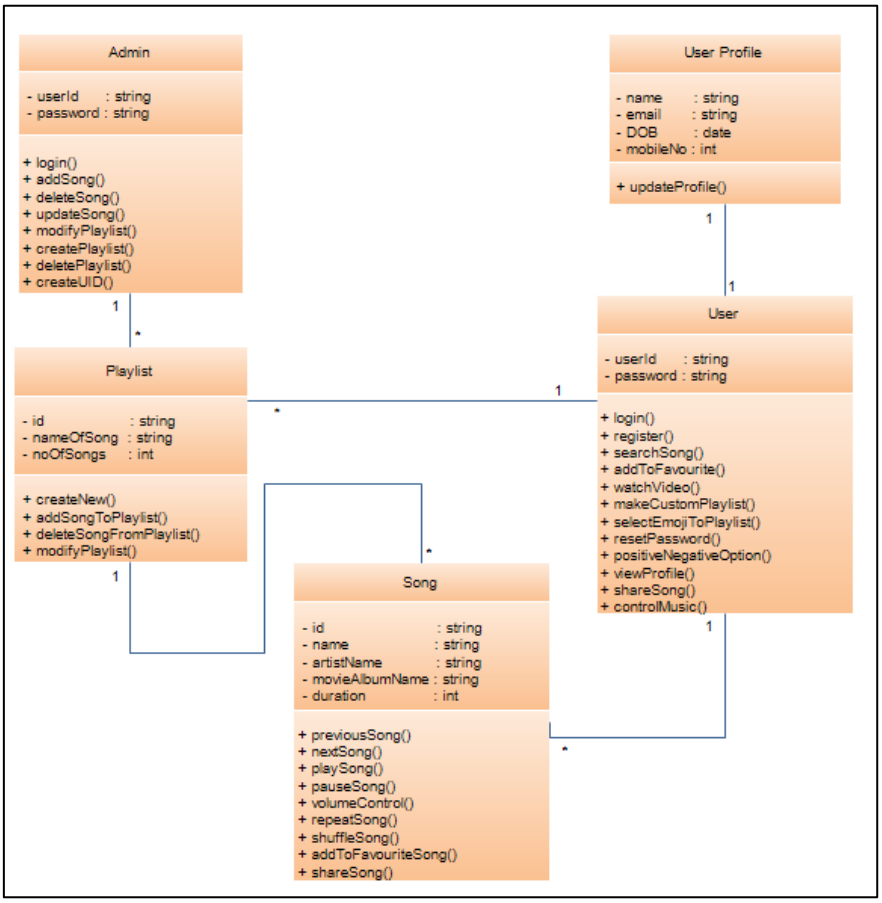


(Activity: Admin)

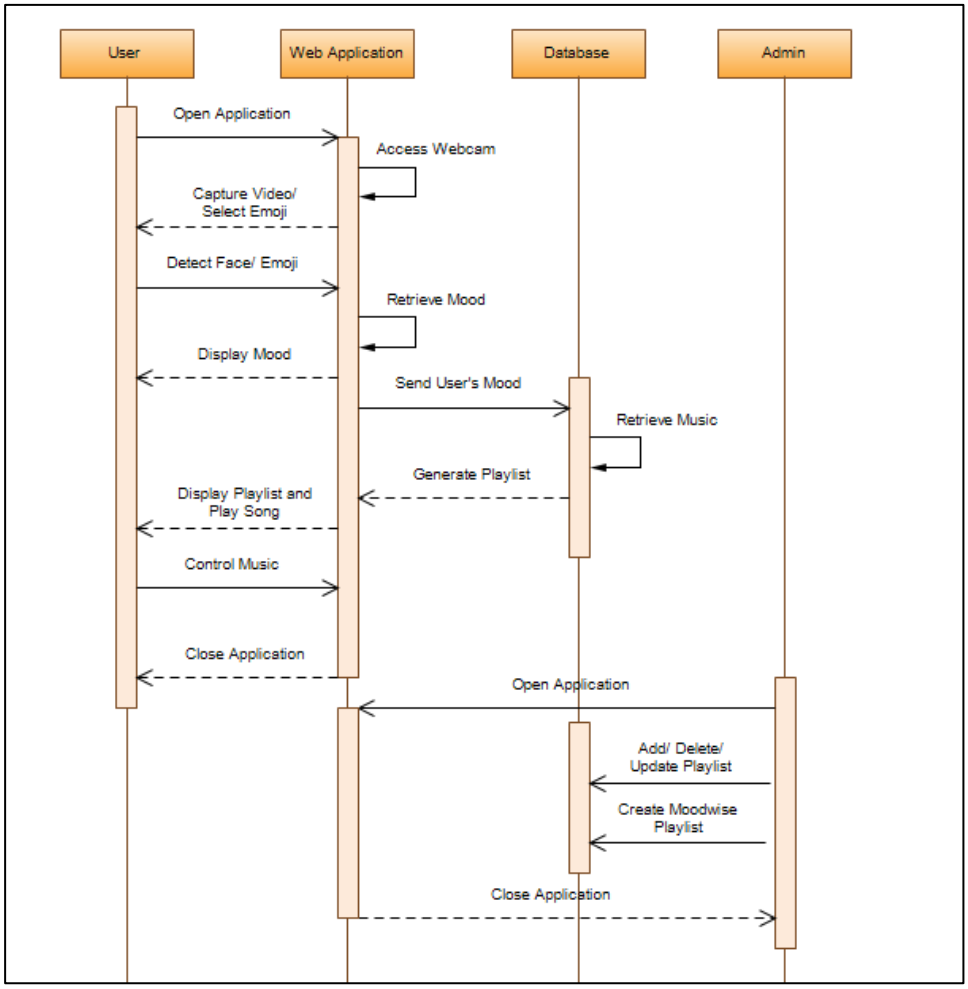


(Activity: Web Application)

4.4.2 Class Diagram:

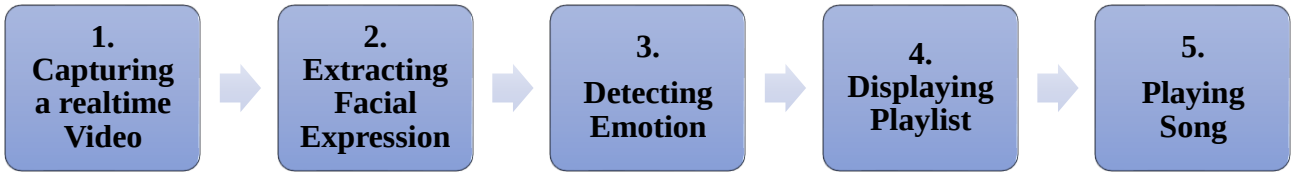


4.4.3 Sequence Diagram:



Chapter 5. PROJECT IMPLEMENTATION

5.1 OVERVIEW OF PROJECT MODULES:



i. **Capturing an Image:** The user gives input which is in the form of an image captured by the camera/ webcam of the user.

ii. **Extracting Facial Expression:** Using the python libraries, the application will extract the facial expressions of the user for the further processing.

iii. **Detecting Emotion:** With the help of extracted facial expression, application will classify the emotions as happy, sad, neutral or anger.

iv. **Displaying Playlist:** The mood wise playlist is chosen according to the facial emotion of the user & gets displayed on the screen.

v. **Playing Song:** At last, the 1st song from the displayed playlist gets played to boost the user's mood after successful detection of sentiments & user can also select the song from the displayed playlist by his/her own.

5.2 TOOLS & TECHNOLOGIES USED:

- **Technologies Used:**

i. Deep & Machine Learning- Deep learning is a type of machine learning that trains computers to learn by mimicking human behaviour. It's an area of computer science that lets computers learn without having to be explicitly programmed. The beauty of machine learning is that you can use models to learn how to differentiate instead of depending on human judgement.

ii. Real Time Video Processing- Video processing is a sort of signal processing that employs video filters and uses video files or video streams as input and output signals. It's a method of enhancing or extracting useful info from a video by applying and executing various operations on it. It's a group of signal processing techniques in which a video serves as the input and the output is either the video or its characteristics/features.

- **Platform Used:**

    i. Tomcat Server- Its primary purpose is to provide as a framework for hosting Java server pages & Java servlets. It's one of the server-side programming languages that allows developers to run and create dynamic content independently.

- **Languages Used:**

    i. JavaScript- JavaScript is a scripting or programming language that allows you to construct complex web page features such as exhibiting real-time content updates, interactive maps, animated 2D/3D images, scrolling video jukeboxes, and so on. It is mostly used to develop the application's frontend.

    ii. Python- Python is a programming language that may be used to create websites and software, as well as automate processes and perform data analysis. It was utilised to build the backend of your application.

- **IDE/Development Tools used:**

    i. Visual Studio Code- Visual Studio Code is a lightweight code editor with debugging, task execution, and version control capabilities. To run JavaScript code for this project, VS Code is utilised.

    ii. Jupyter Notebook- The Jupyter Notebook App is a server-client web application that allows you to edit and run notebook documents. It is used to run Python scripts in this project.

    iii. MongoDB Atlas- MongoDB Atlas is a fully managed cloud database that handles all aspects of installation, monitoring, and recovery on your selected cloud service provider (AWS, Azure, and GCP). MongoDB Atlas is the best way to deploy, run, and scale MongoDB in the cloud.

5.3 DATASET USED:

We used a dataset to train our models that is: FER-2013. FER stands for Facial Expression Recognition, which is FER-2013 Dataset contains approximately 30,000 facial RGB labelled images of different emotions/expressions with the size restricted to 48×48, and the image labels of it can be divided into 7 types: 0=Happy, 1=Sad, 2=Fear, 3=Neutral, 4=Disgust, 5=Surprise, 6=Angry by giving a 24.4 percent baseline for random guessing. The pictures in FER-2013 are grayscale and 48x48 pixels and include both posed and unposed headshots. The FER2013 dataset was developed by compiling the results of each emotion's Google image search as well as synonyms. Also, in FER-2013 the training set consists of 28,709 image examples and the public test set consists of 3,589 labelled image examples.

5.4 ALGORITHM DETAILS:

(A) CNN (Convolutional Neural Network)-

Facial expressions are the simplest way of expressing the mood of an individual. The facial expressions are captured employing a webcam and face detection is finished by using the Haar cascade classifier.

The captured image is input to CNN which learns features and these features are analysed to work out this emotion of the user then the music is played in step with the emotion. during this project, seven emotions are considered for classification which include happy, sad, anger, surprise, neutral, disgust and fear. This project consists of 4 modules-face detection, feature extraction, emotion detection, and songs classification. Face detection is completed by the Haar cascade classifier, and have extraction and emotion detection are done by CNN. Finally, the songs are played in keeping with the emotion recognized.

Convolutional Neural Networks (CNNs) are a type of Artificial Neural Network that is commonly used for image classification.

CNN is a deep learning model for processing data that combines a grid pattern, similar to photographs, that is inspired by the organisation of the animal cortex region and meant to learn spatial hierarchies of characteristics, from low- to high-level patterns, automatically and adaptively.

CNN is a mathematical construct made up of three different types of layers (or building blocks): convolution, pooling, and fully linked layers. The first two layers, convolution and pooling, extract features, while the third, a completely linked layer, transfers the extracted features into the final output, such as classification.

A convolution layer is an important part of CNN, which is made up of a series of mathematical operations such as convolution, which is a specific type of linear operation. Pixel values are stored in a two-dimensional (2D) grid in digital images, i.e., an array of numbers, and a tiny low grid of parameters called the kernel, an optimizable feature extractor, is applied at each image position, making CNNs highly efficient for image processing because a feature may occur anywhere within the image. Extracted features can hierarchically and steadily become more sophisticated as each layer feeds its output into the next.

Training is the process of adjusting parameters such as kernels in order to reduce the difference between outputs and ground truth labels using optimization algorithms such as backpropagation and gradient descent, among others.

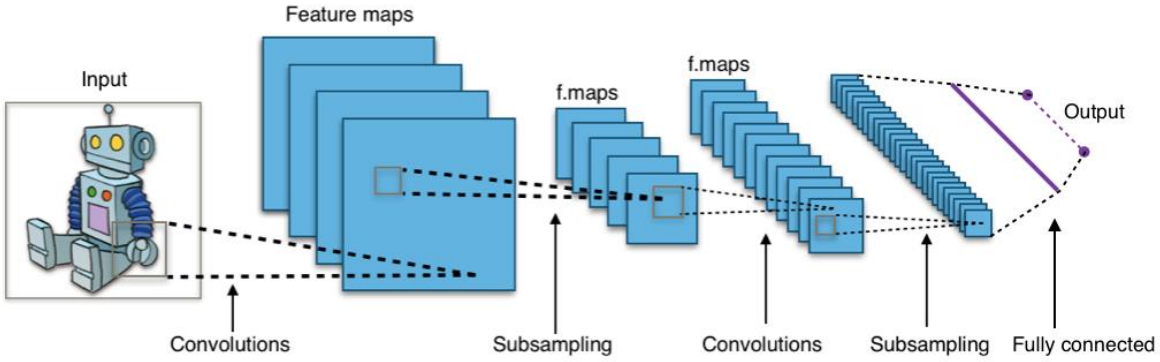


Fig- 5.1 CNN
(Source: https://en.wikipedia.org/wiki/Convolutional_neural_network)

Chapter 6. SOFTWARE TESTING

6.1 TYPES OF TESTING:

(A) Black Box Testing: A software testing method that checks an application's functionality without having particular knowledge of the application's code or internal structure. The requirements and functionality are the basis for the tests.

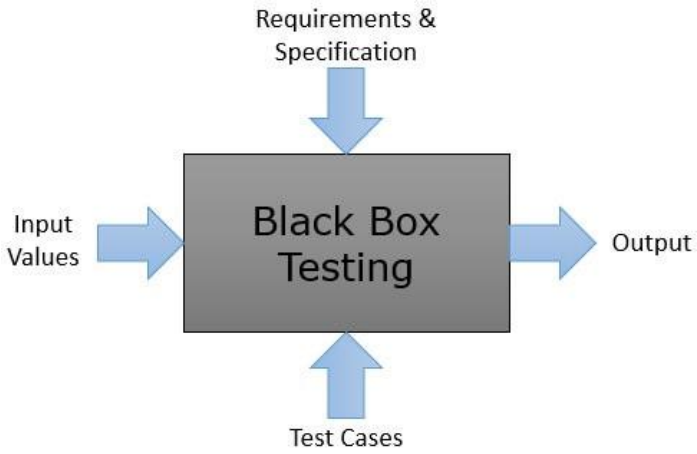


Fig- 6.1 Black Box Testing
(Source: https://binaryterms.com/wp-content/uploads/2020/03/Black-Box-Testing.jpg)

(B) **Unit Testing:** Unit testing is a software development technique that examines the smallest testable elements of a programme, known as units, separately and independently for appropriate operation.

(C) Integration Testing: It is a sort of software testing in which the various parts, modules, or components of a software programme are all tested together. However, various programmers may have created these modules.

(D) Regression Testing: The programme gets updated whenever a new module is added. This type of testing ensures that the entire component works properly after it has been integrated into the overall programme.

(E) White Box Testing: White box testing is a way of evaluating and verifying a software system's inner workings, including its code, infrastructure, and links to other systems.

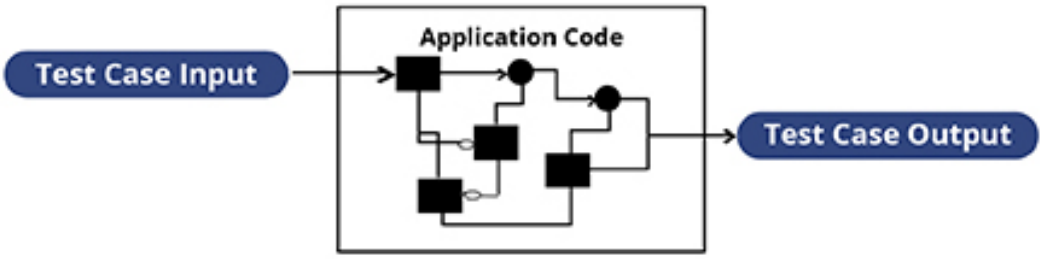


Fig- 6.2 White Box Testing
(Source: https://cyberhoot.com/wp-content/uploads/2020/03/White-Box-Software-Testing-Invensis1.jpg)

6.2 TEST CASES & TEST RESULTS:

Table- 6.2 Test Cases & Test Results

Precondition/ Assumption	Test case ID	Test case name	Test case description	Test steps			Status Pass / Fail
				Steps along with input data	Expected result	Actual result	
Open web browser and enter valid URL of emotion-based music player website.	TC1	Authenticate Login ID	To verify that Login ID must be Email ID or mobile number.	1.Enter Login ID as Email ID. 2.Enter correct password. 3.Click on "Login" button	Message displayed "Login Successful".	Message displayed "Login Successful".	Pass
	TC2	Authenticate Password	To verify that password must be greater than 6 characters.	1.Enter valid login ID 2.Enter 2-character password 3. Click on "Login" button	An error message "Password should be greater than 6 letters" should be displayed	An error message "Password should be greater than 6 letters" displayed	Pass
	TC3	Authenticate Password	To verify that password should contain at least 1 special character and 1 number	1.Enter valid login ID 2.Enter invalid password (like "aabbcc12") 3. Click on "Login" button	An error message "Password should contain at least 1 special character and 1 number" should be displayed	A "Successful Login" message displayed	Fail
After successful login, home page should be opened.	TC1	Check "Select emoji to play" option.	According to selected emoji that particular playlist should be displayed.	1. Click on "Happy" Emoji.	Playlist of happy songs should be displayed.	Playlist of happy songs displayed	Pass
	TC2	Validate whether all artists are displayed after clicking on "Artists" tab.	After clicking on artists tab, the list of all artists should be displayed.	1. Click on "Artists" tab.	List of all artists should be displayed.	List of all artists displayed.	Pass

After successful login, click on search tab. Search page must be opened.	TC1	Validate whether the searched is displayed after searching it.	Verify that after searching for a particular song that song should be displayed.	1. Enter the name of the song.	After searching for a particular song that song should be displayed	After searching for a particular song that song displayed	Pass
	TC2	Validate whether the "Repeat" button is working properly in "Currently playing" tab.	Verify that after clicking on repeat button that song is repeated or not.	1. Click on repeat button	After clicking on repeat button that particular song should be repeated.	After clicking on repeat button that particular song repeated.	Pass
After successful login, click on favourites tab. Favourites page must be opened.	TC1	Validate whether the chosen song is displayed on "Favourites" page or not.	Verify that after clicking on favourites button that song is displayed on "Favourites" page or not.	1. Click on favourites button. 2. check whether the song is displayed on "Favourites" page or not.	Song should be displayed on "Favourites" page.	Song is displayed on "Favourites" page.	Pass
After successful login, click on recently played tab. Recently played page must be opened.	TC1	Validate whether the recently played song is displayed on "Recently played" page or not.	Verify that recently played song is displayed on "Recently played" page or not.		Recently played song should be displayed on "Recently played" page	Recently played song is displayed on "Recently played" page.	Pass
After successful login, click on create new playlist tab. Create new playlist page must be opened.	TC1	Validate whether user is able to create new playlist or not.	Verify that user is able to create new playlist or not.	1. Enter name of your new playlist. 2. Click on create button.	New playlist should be created.	New playlist is created.	Pass
After successful login, click on create on mood wise playlist tab. Create on	TC1	Validate that after clicking "Sad" tab happy songs playlist should be displayed.	Verify that after clicking "Sad" tab happy songs playlist should be displayed.	1. Click on "Sad" tab.	Sad song playlist should be created.	Sad song playlist is created.	Pass

Mood wise page must be opened.							
After successful login, click on my playlist tab. My Playlist page must be opened.	TC1	Validate that after creating a new playlist that playlist should be displayed on “My Playlist” page.	Verify that after creating a new playlist that playlist should be displayed on “My Playlist” page.	1. Create a new playlist. 2. The new created playlist should be displayed on the “My Playlist” page.	New playlist should be displayed on “My Playlist” page.	New playlist displayed on “My Playlist” page.	Pass
After successful login, click on Settings tab. Settings page must be opened.	TC1	Validate that if Auto-play option is working properly.	Verify that if Auto-play option is enabled then next song should be played automatically.	1. Enable Auto-Play option.	Automatically next song should be played.	Automatically next song should is played.	Pass

Chapter 7. RESULTS

7.1 OUTCOMES:

(A) Proposed Model-

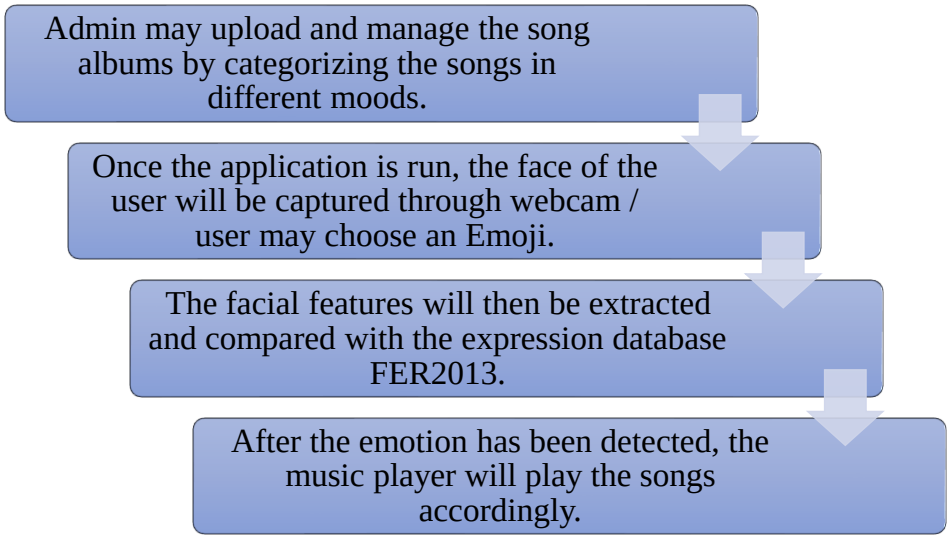


Fig- 7.1 Working of the proposed model

(B) Flowchart-

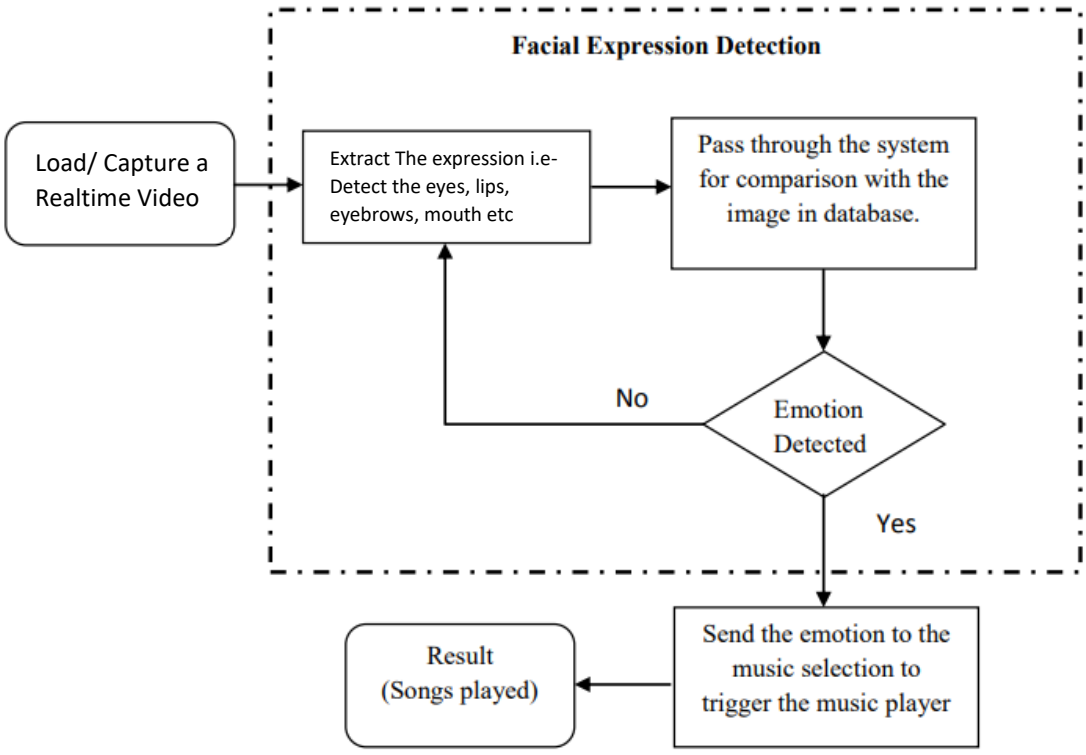


Fig-7.2 Flowchart of the Proposed System

7.2 SCREEN SHOTS:

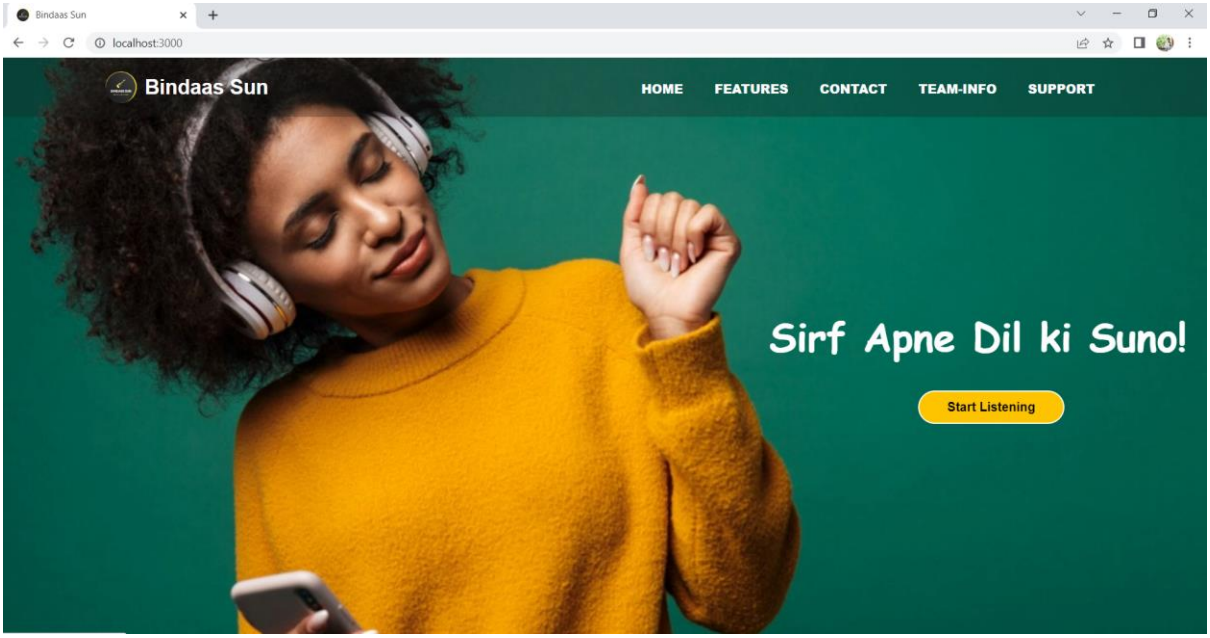


Fig- a. Home Page

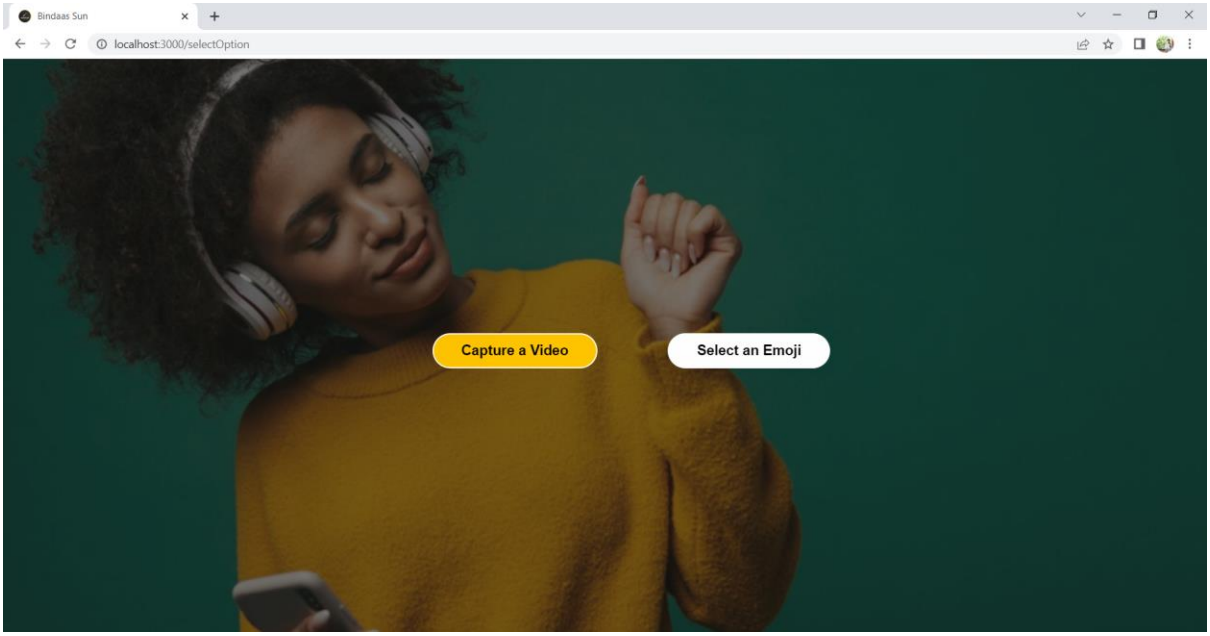


Fig- b. Mode selection: Selected Mode= Capture Video

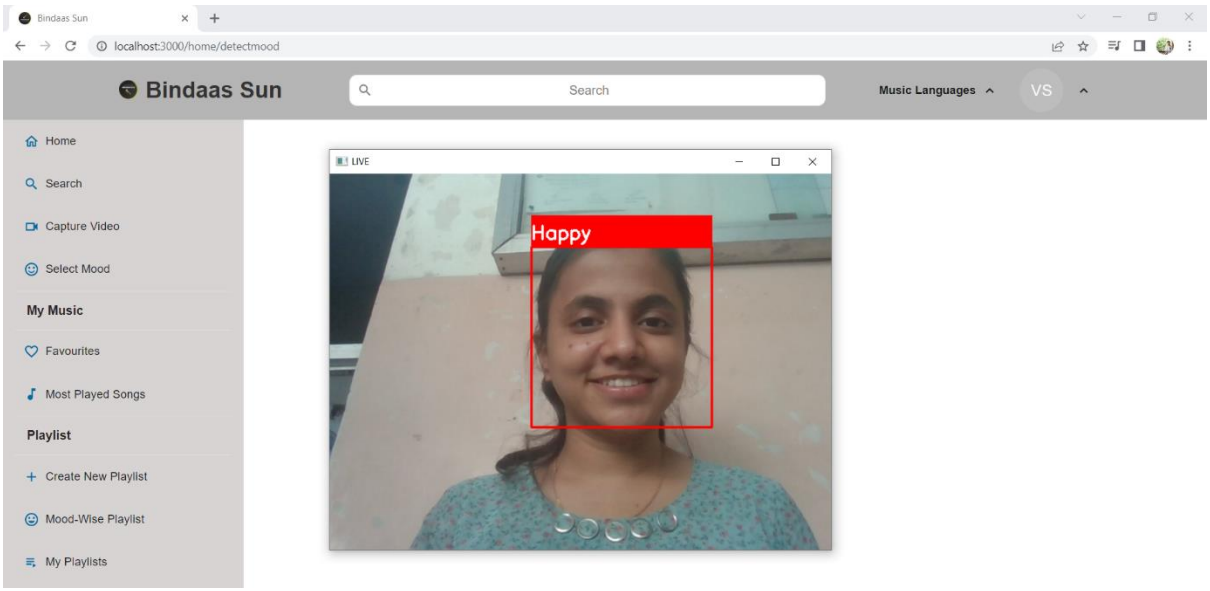


Fig-c. Capturing Real Time Video for Detecting Emotion

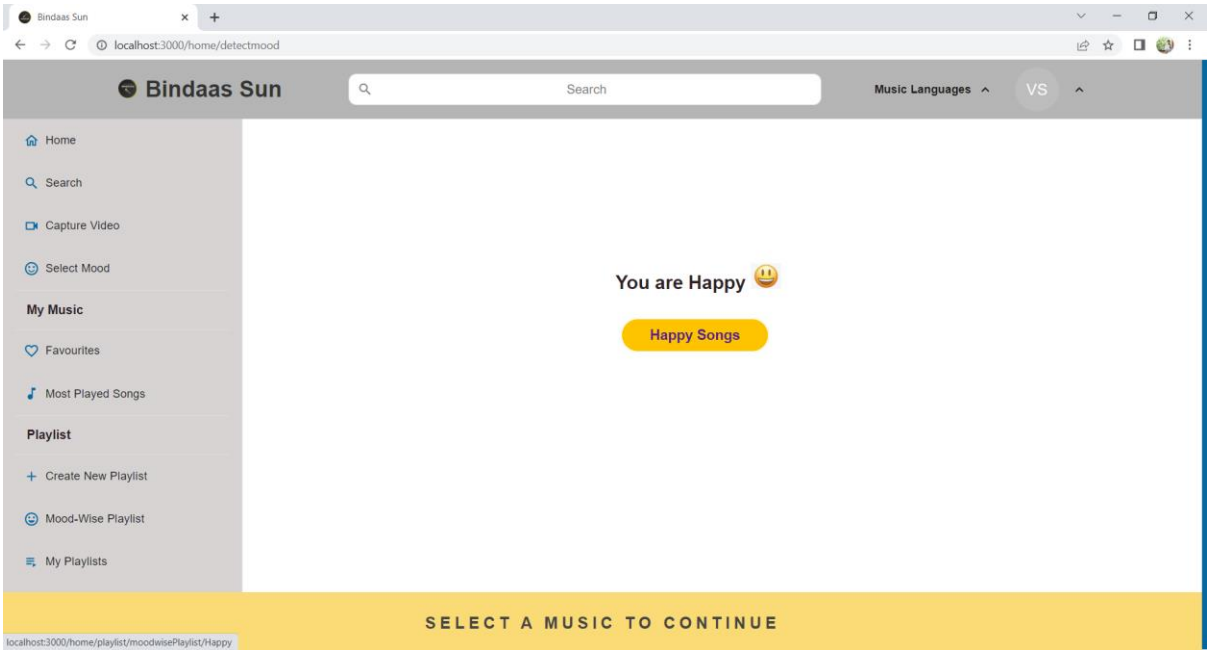


Fig-d. Detected Emotion

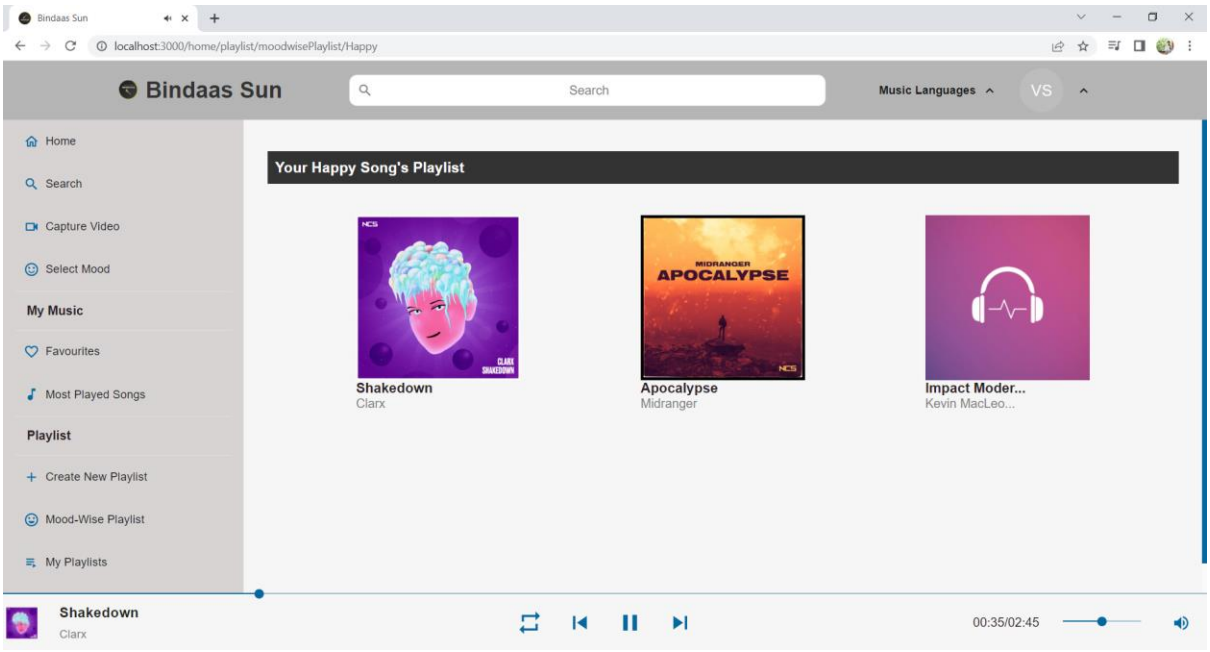


Fig-e. Displaying Mood-wise Playlist

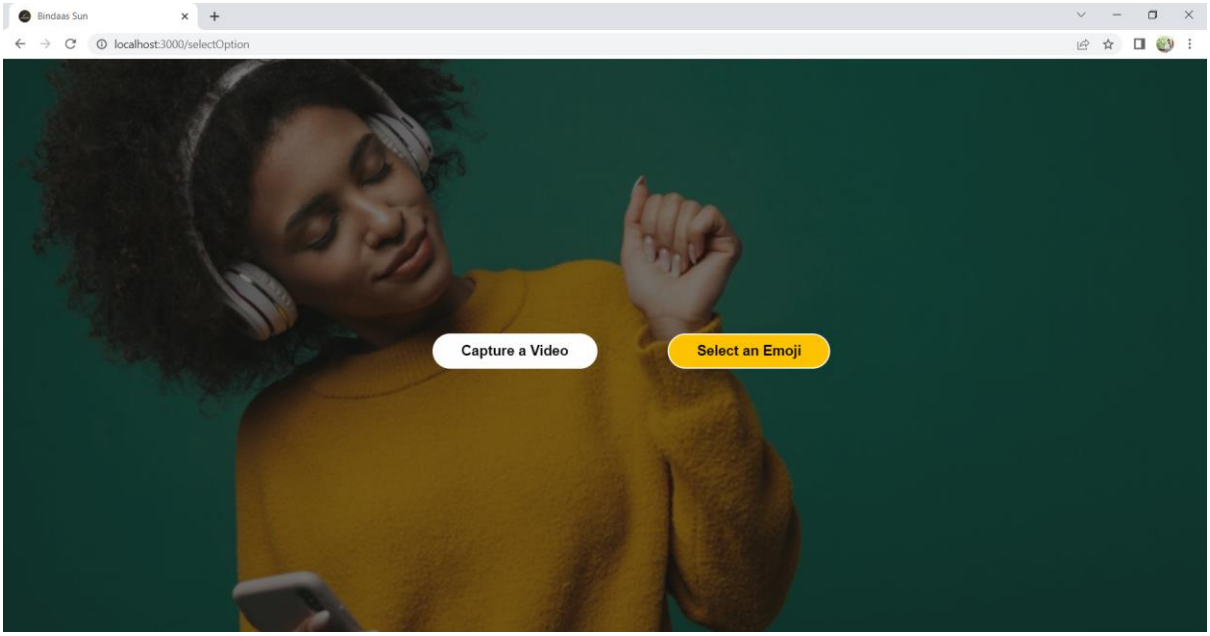


Fig-f. Mode selection: Selected Mode= Select Emoji

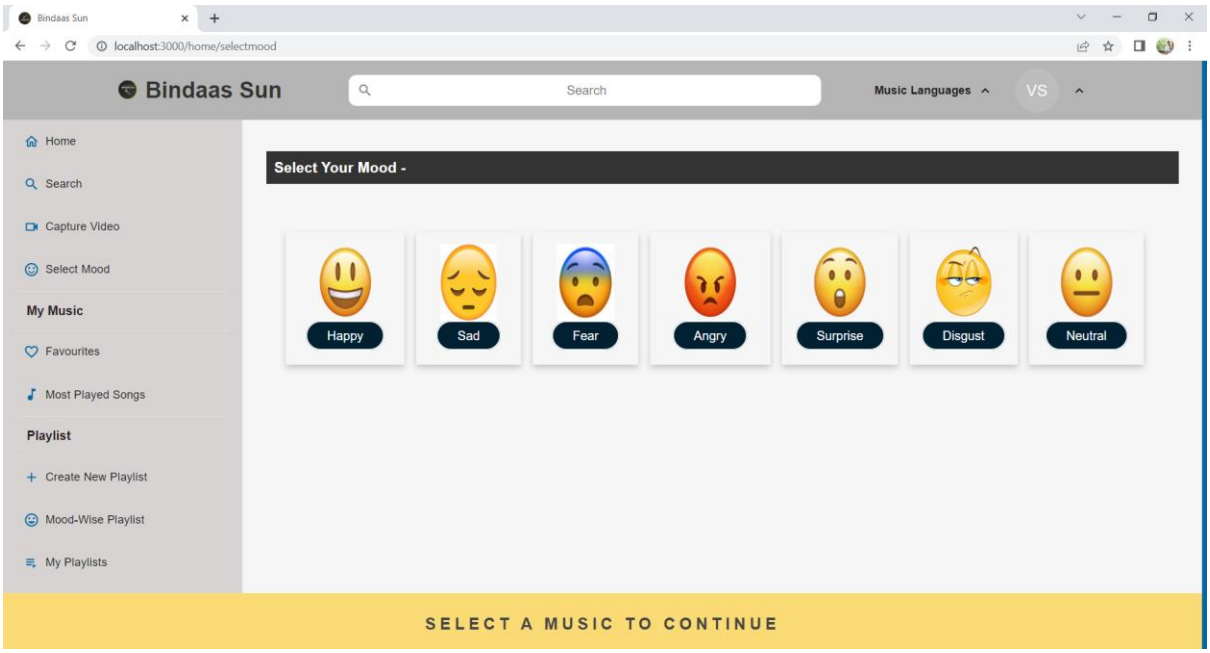


Fig-g. Choose mood by selecting an Emoji

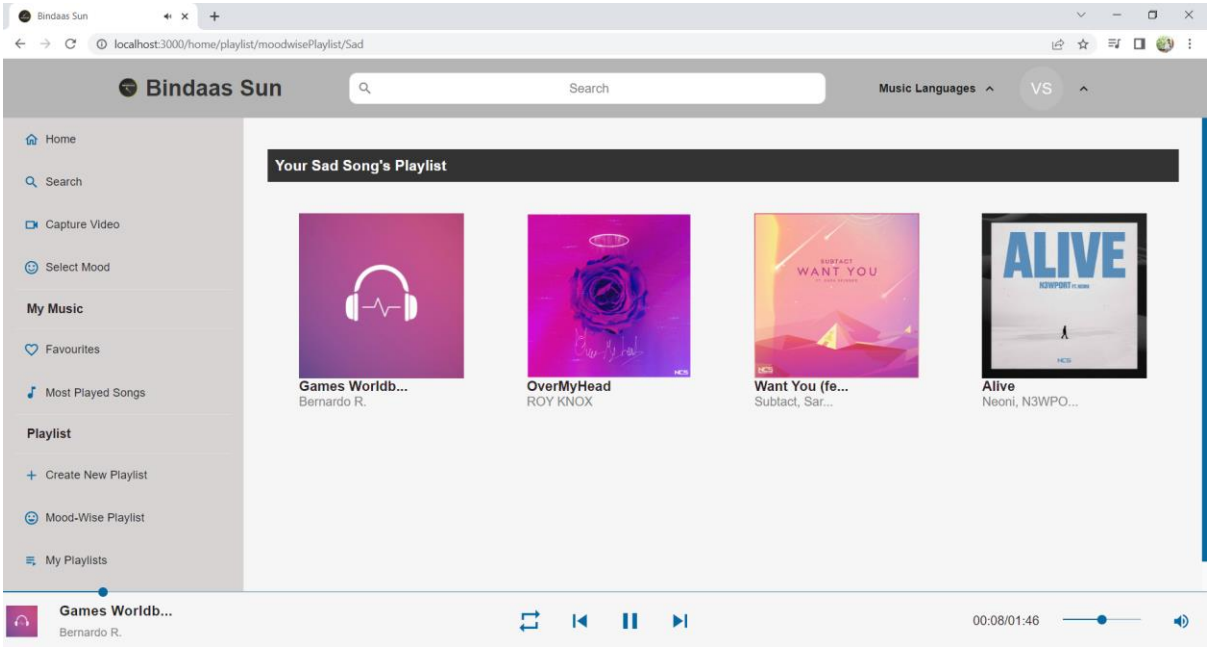


Fig-h. Displaying Playlist for the selected Mood

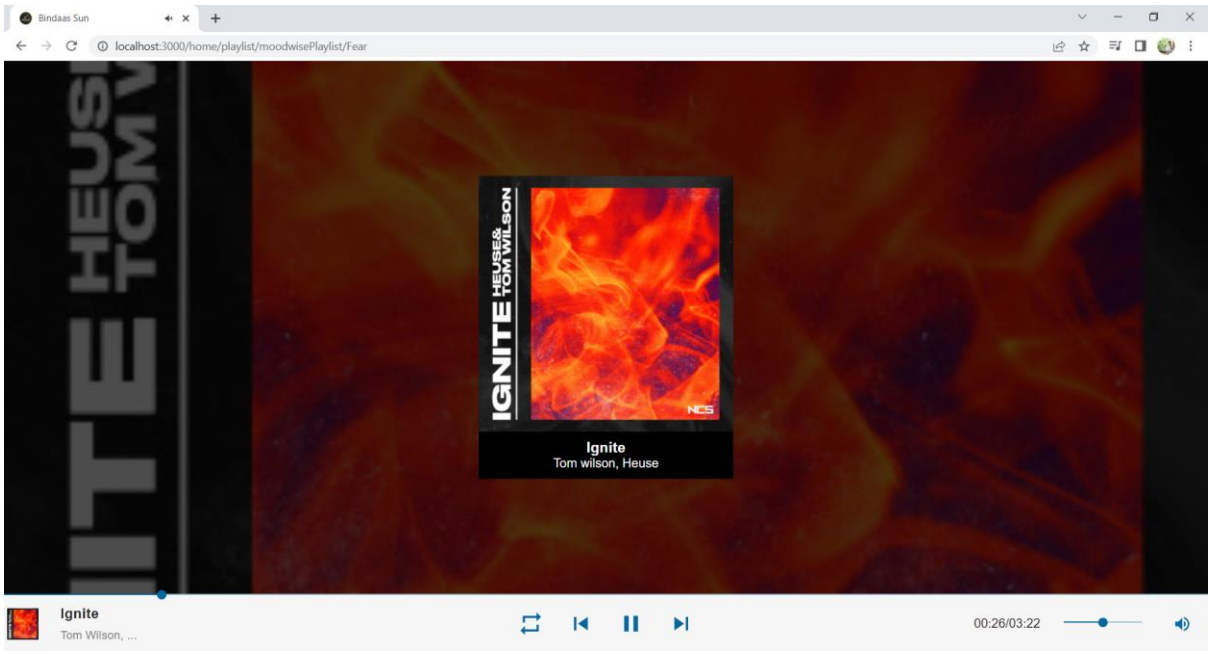


Fig-i. Play & Control Songs

Chapter 8. CONCLUSION & FUTURE WORK

8.1 CONCLUSION:

The study proposes a web application that implements an emotion-based music player. The Haar Cascade classifier is used to recognise faces taken by a webcam. In addition, the captured face is fed into a convolutional neural network (CNN), which extracts information from the facial expression and detects the emotion.

The application will then begin to play relevant music in accordance with the user's preference mode, based on the user's feeling. Positive songs will be played if the user picks the positive option, which will lighten and cherish the user. Users can, on the other hand, listen to negative music to stay in that mood for a while.

User can also cherish itself by watching the video of the of the particular song. To enhance the performance of the application and to get more accurate results more techniques and algorithms can be explored and implemented to eliminate uncontrolled environment affection.

8.2 FUTURE WORK:

- The upgraded application will allow user to play songs using speech recognition along with emotion detection.
- The emotion can also be detected using the heartbeat of a person which will help us to give more accurate results.

8.3 APPLICATIONS:

- The Emotion-Based Music Player automates and improves the music player experience for the end user.
- The webapp satisfies music listeners' basic needs without troubling them in the way that other apps do: it uses technology to improve the system's contact with the user in a variety of ways.
- It generates a music playlist based on the real-time mood of users.
- The system may avoid the wastage of a device memory & lessen the manually browsing of the music.
- To suggest a play-list for that emotion, to saves a lot of time for a user.

APPENDIX A- PLAGARISM REPORT

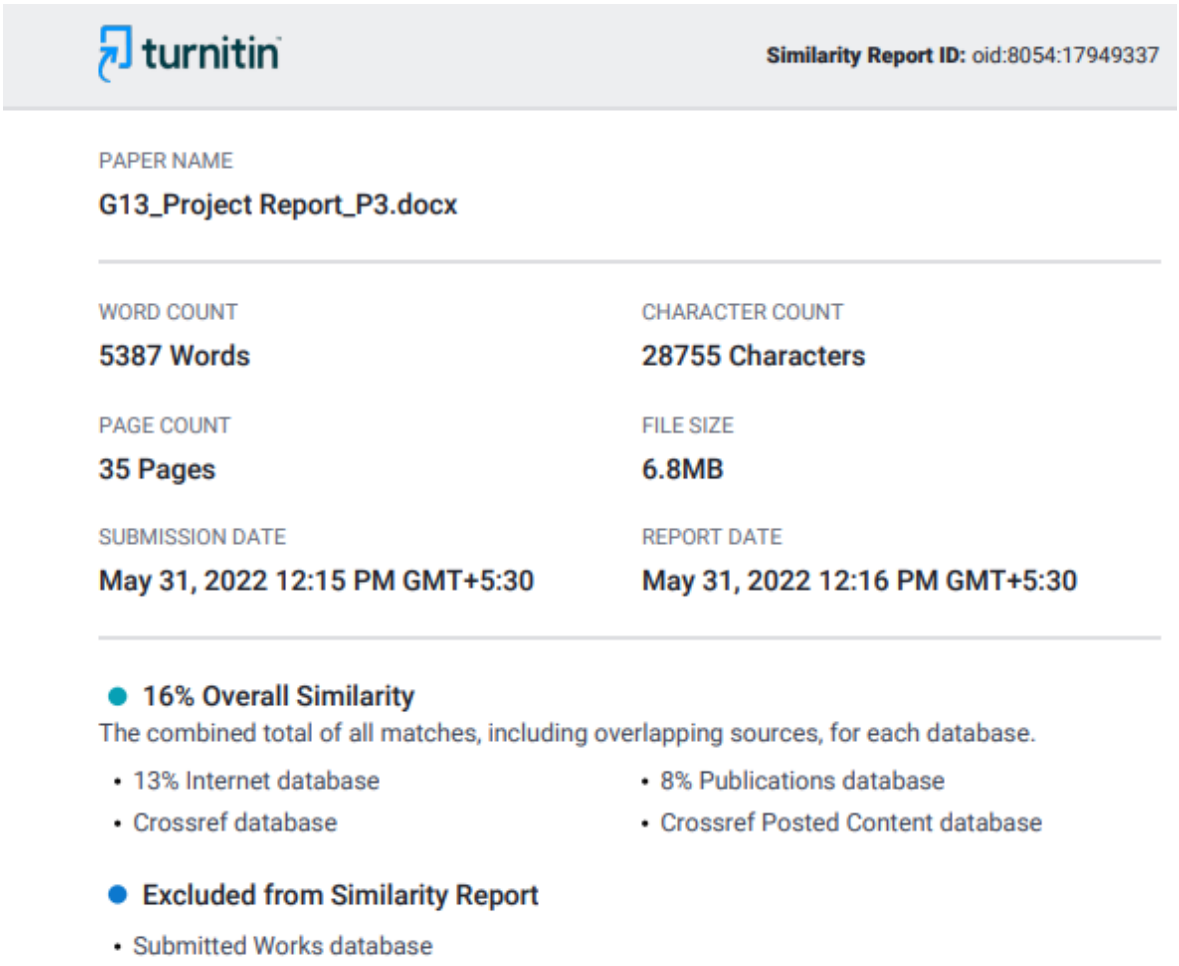


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Fig- A. Plagiarism Report by Turnitin

APPENDIX B- USER MANUAL

1) **Get the WebApp:**
   'Bindaas Sun' is available on desktop, mobile, tablets and more!

2) **Create Your Account:**

   a) Just choose SIGN UP from the login screen in the app. You can use either your email or phone number. Gender, date of birth, and what we should call you are all optional sign-up parameters (your display name).
   b) If you already have an account, Log in to the app through your Google account, email, or mobile number.

3) **Start Playing:**

   a) Investigate and learn! The more you use 'Bindaas Sun,' the better we get to know you and can make personalised music recommendations.
   b) Once you have logged in and are inside the app, there are several options for you to explore.
   c) You can click on the search button and type the name of any song, artist, movie or album.
   d) You can add music to a playlist or place it in your favourites accordingly.
   e) Browse through the homepage to explore various recommendations, discover music, playlists, and much more.
   f) You can operate the app in any mode: AUTO or MANUAL by simply selecting the option.
   g) You can play the songs directly by selecting an Emoji through 'Select Emoji' option.
   h) You can listen to the songs which you've listened most of the times while using the app by 'Mostly Played Songs' option.

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