Project Title,

EMOTION BASED MUSIC PLAYER

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1. INTRODUCTION

Music is crucial factor of fun for music listeners as well as music lovers, it plays a significant role in uplifting an individual's life. There are various music players available in market today, which contains features such as fast forward, backward, changeable playback speed, genre segregation, streaming playback with multicast streams, and volume modulation, among others, with the increasing advancements in the field of multimedia and technology.These capabilities fulfills user's basic needs, but the user will still have to actively search the song library and select songs that suit their current mood and behaviour.Facial expression based music player is a revolutionary concept that gives user a facility to play songs automatically considering feelings as basis. Its goal is to give user-favorite music based on the emotions sensed. In the current system, the user must manually select the songs because randomly played songs may not match the user's mood. Instead, it is the task of a user to segregate songs into different emotional categories and then select a song based on particular emotion manually before playing songs. The music will be played from the predefined folders based on the emotion. There are certain number of songs available in each sub directory, in which each sub directory corresponds to certain emotion. Programmer have access to change,replace or delete these songs which are available in these songs which are available in these sub folders according to user requirement.There is a possibility that at times,user might want to listen different songs in a particular mood.Let us consider an example,if a user is in sad mood,then it is completely his/her choice to choose a song according to their mood.Considering this scenario,the following are two certain possibilities:

1. User would like to carry forward his present emotion of being sad.
2. Else, user would like to refresh his/her mood turning it into happiness.

Therefore, depending on the choice of users the songs in the sub directories can be changed.

As the program runs successfully on system,

System Requirements

The following are the minimum requirements to develop this application

1. Hardware requirements

- Processor : 2 GHz
- RAM : 1 GB

2. Browser

- Chrome 51 or higher
- Firefox 47 or higher
- Opera 37
- Edge 105

3. Database

- Firebase
- NoSQL 0

4. API : Affective Emotion Recognition API

1.1 PROPOSED SYSTEM WORK

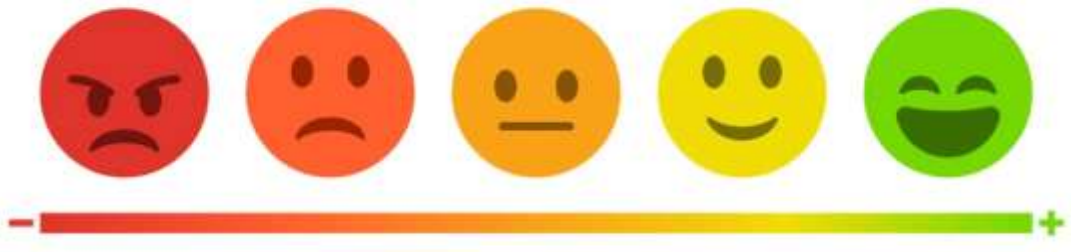
The suggested system can detect the user's facial expressions and extract facial landmarks based on those expressions, which can then be categorised to determine the user's sentiment. After the emotion has been identified, the user will be shown songs that match their emotions.

Emotion Based Music Player is a great tool for music fans who have a smartphone and access to the internet. Anyone who creates a profile on the system has access to the application. The application is meant to address the following user needs, as listed below:

1. Registering for an account or signing up, and then logging in
2. Adding music
3. Discarding songs
4. Updating the music

5. Recommendations and a personalised playlist

6. Emotions Capture



From above fig., Accordingly to which we can classify emotion directory for playing song we have chosen this 4 Emotions.

2.0 LITERATURE SURVEY

In market, many applications are available which gives us provision to create a playlist in music player but with the usage of emotions of user, a variety of techniques and approaches have been proposed and progressed. Only few fundamental emotions are focused with the usage of complex methodologies such as Voila and Jones.

Several scientific publications that give a brief overview of the concept are:

[1] Music is extremely significant in human culture as well as in modern technological technologies. Typically, the user is faced with the burden of manually searching through a playlist of songs in order to select one. Considering user's present emotion, a list of songs are generated with the help of an effective and precise algorithm. Existing methods for automated playlist building are computationally inefficient, inaccurate, and can involve the usage of additional gear such as EEG or sensors Speech, being the most ancient and natural manner of conveying sentiments, mood, and its processing are the most ancient and natural ways of doing so. The proposed system can be used to identify user's facial expressions as well as to draw facial landmarks from the expressions, which

can be further categorized to identify the present mood of user. The user will be presented songs that fit their emotions when the emotion has been recognized. Facial Expression Based Music Player is a fantastic app for music lovers with smart phones and internet access.

The application is accessible to everyone who creates a profile on the system. The following are the requirements that can be fulfilled with this programmed:

1. Making an account or signing up for one, and then logging in.
2. Adding music
3. Getting rid of songs
4. Keeping the music up to date
5. Recommendations and a playlist tailored to you
6. Feelings Captures automatically, resulting in a reduced calculation cost.

[2]A music collection is sorted with the help of an intelligent agent on the basis of emotions that each song gives and then recommends user a playlist according to their mood. The user's local music collection is initially clustered based on the emotion conveyed by the song, i.e. the song's mood.

Song's lyrics and music are taken into account to frequently assess. When a user wants to create a playlist that is mood-based, they take a snap of themselves at that time. The user's sentiment is recognized using facial detection and emotion identification techniques on this photograph. The user is then given a playlist of music that best suits this emotion.

[3]Stress factor is growing high in people because of factors like lousy economy, financial responsibilities and other factors. Listening to music can be a beneficial pastime for reducing stress. However,if the music and listeners present emotion does not match, it will be ineffective Furthermore, we do not have any music player in existence which can pick songs on the basis of the listener's mood. To address this issue, this study presents a facial expression-based music player that may suggest songs that support the user's emotions of sadness, happiness, neutrality, and anger. From a smart band or a mobile camera, the appliance receives the user's pulse or a facial image. The categorization algorithm is then used to detect the user's sentiment. This paper discusses two types of categorization approaches: gut rate-based and, as a result, facial image-based methods.

The device then plays music that are in the same mood as the user's emotion. Because the proposed approach is able to precisely characterize the pleasant mood based on the trial data.

4] Recording, playing, processing, and managing digital audio is simple. Because of its widespread use, gadgets for handling it are inexpensive, allowing more people to record and play music and speech. In addition, the internet has made it easier to obtain recorded audio. As a result, the number of people who own recorded music has significantly expanded. Audio files are compressed and stored in internal memory by most modern audio players.

As a result of steady decline in storage costs,the amount of music to be stored has increased.If every song contains 5Mbytes and stored in compressed format, a player with 16 Gbytes of memory may hold around 3,200 songs. It is a tough task to organize large amounts of music efficiently. People frequently listen to a small number of preferred songs again and over again, while others are unjustifiably ignored. Affection is a music collection management system that we created. Affection categorizes songs that express similar feelings and assigns an icon to each category. These indicators makesit easier for listeners to find music that is appropriate for their mood. Affection's usefulness has been proven in studies.

[5] The recognition of emotion with the usage of spoken speech signal as an input is what a smart music system is about. The speech emotion recognition (SER) system's goal is to find a person's emotional state from their voice. Anger, anxiety, boredom, happiness, and sadness are all identified in this study.Speech processing using the Berlin emotional database, then extracting necessary features and selecting acceptable pattern recognition or classifier algorithms to recognize emotional states are all critical components of implementing this SER system.

When the speech’s emotion is recognized it is the duty of system platform to automatically pick a piece of music from the collection of song of song playlists stored as a cheer-up technique. The results of the investigation demonstrate that when this SER system is used to classify five emotions, it achieves a success rate of 76.31 percent using the GMM model and an overall accuracy of 81.57 percent using the SVM model.

[6] Our way of life revolves around music.People tend to listen to music in many situations,could be in any way actively or passively,consciously or unconsciously feeling it as a kind of emotion expression. We describe a web-based interactive music system that is location and emotion aware in this study.The goal of this system is to provide user with their favourite music along with keeping a track of their whereabouts and emotions. The system begins by making recommendations based on expert knowledge.Incase,if the user is not satisfied with the recommendation,he/she can ignore it and can pick music of their own. For music preference learning, the user's interactions with the system, current location, and emotion are logged during this process. As a result, the system may adjust to the user's current musical tastes. Furthermore, the more the user interacts with the system, the more personalized music is created for him or her.

[7] The authors demonstrated a one-of-a-kind multi-modal access to massive MP3 music libraries. Retrieval is frequently accomplished using either a content-based or keyword-based approach. Speech is input by tongue utterances or singing, while manual interaction is input via scribbling, typing, or hard keys. Contextual knowledge of the time, date, season, user emotion, and listening habits is combined into the retrieval process to provide extremely robust retrieval results and automatically propose music to the user. Speech or visual reactions are used by the system to communicate with the user. The concepts displayed are tailored for use at home and on the go with tablet PCs, PDAs, and other PC solutions.

2.1PROBLEM STATEMENT

In inter personal relationships, being conscious of one's own emotions critical. Since the beginning of time, the automated recognition of emotions has been a hot academic topic. As a result, great progress in this subject has been made. Emotions are expressed through speech, hand and body gestures, and facial expressions. As a result, when it comes to extracting and comprehending emotion, the combination of human and machine communication is crucial. We used an emotion recognition technique that combined OpenCV face recognizer classes with an open source data flow framework in this project. Convolution neural networks perform better for

emotion recognition after the algorithm sharpens the image and removes some of the area that is responsible for more precise emotion recognition based on facial expression dynamically and discusses the application of feature extraction of facial expressions with a combination of neural networks for the recognition of different facial emotions (happy, sad, angry, neutral etc..). As we know very well that music has a huge impact on the mood of the person, this project focuses on the music player part to change the emotion of the person using the product. The emotion that is being recognized from the machine learning techniques mentioned above is made as the basis for which kind of the music is to be played for the particular person. The music player's User interface is designed using the commonly used web technology such as HTML CSS and Javascript. The emotion recognition algorithm is linked to this music player using the eel library present in the python programming language. The main aim of this project is to play the music according to the current person's emotion which is recognized by analysing the facial expression of the user.

MOTIVATION

[1] Sound Cloud, Spotify:

While using Sound Cloud and spotify we found that they recommend music based on search history and favourites cache tray. Also found that they use pattern analysis to recommend songs. On further exploring we found that there are expression recognition systems based on words we type. Then we consider why not consider a music recommendation system based on the mood of the user.

[1] 2016 Automatic emotion detection model from facial expression

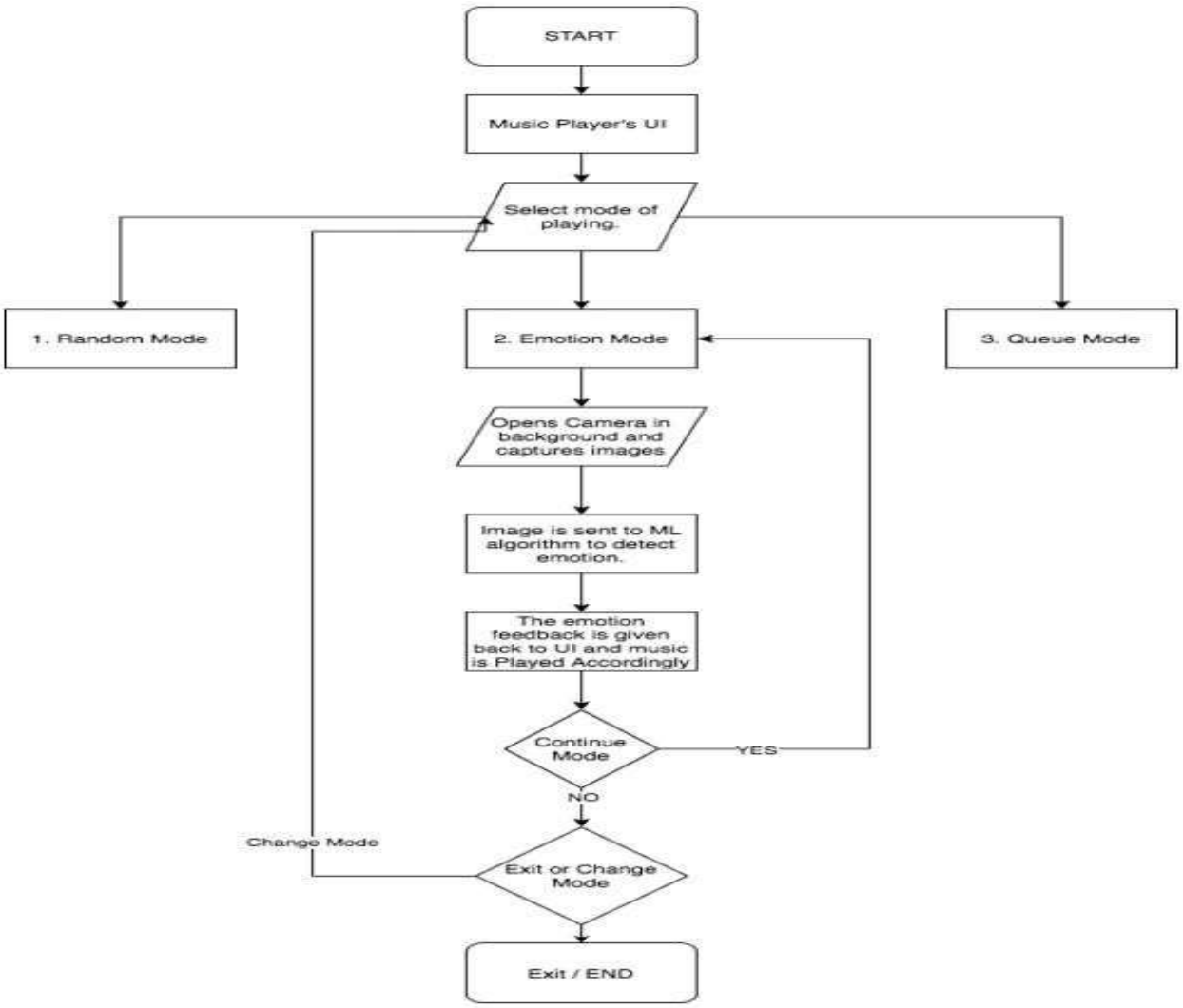
https://ieeexplore.ieee.org/document/78

Emotion recognition is a two-step process which starts with extraction of important features and finishes with classification. Feature extraction identifies a group of independent features that, when combined, can depict a facial expression. To recognize emotions, features are mapped into various emotion classes such as anger, happiness, sadness, disgust, astonishment, and so on. Both the collection of feature variables used for feature extraction and the classifier in charge of classification are equally important in determining the performance of a facial expression identification model. Even a sophisticated classification method may not be able to deliver a perfect result for a poorly chosen set of feature qualities in some instances. As a result, selecting superior characteristics is essential for achieving high classification accuracy and a high-quality result.

2.2 PROJECT OUTCOME: Product

We are going to make a product and it'll be a music player integrated with a face recognition algorithm. The algorithm will be able to identify the facial expression of the user and classify the human emotion generated. According to that, it will play a certain type of music that will be suitable for the user's current mood and sooth them. The music player will have a general mode also for someone who wants to listen to music in general. There will also be a queue mode if someone wants to listen to a certain type of playlist.

2.3 FLOWDIAGRAM:



2.4 PROCESS MODEL:

We are going to implement a **WaterFall Model.**

- The requirements for our project are clear and fixed.
- The definition of the product is consistent.
- Technology is well-understood and unchanging.
- In our project, there are no confusing criteria.
- The product is supported by resources with the necessary experience, and the majority of the technology were already in place.
- The project is short.
- So based on our project's features we consider the waterfall model as a suitable software model for our project.

3 Requirement Analysis:

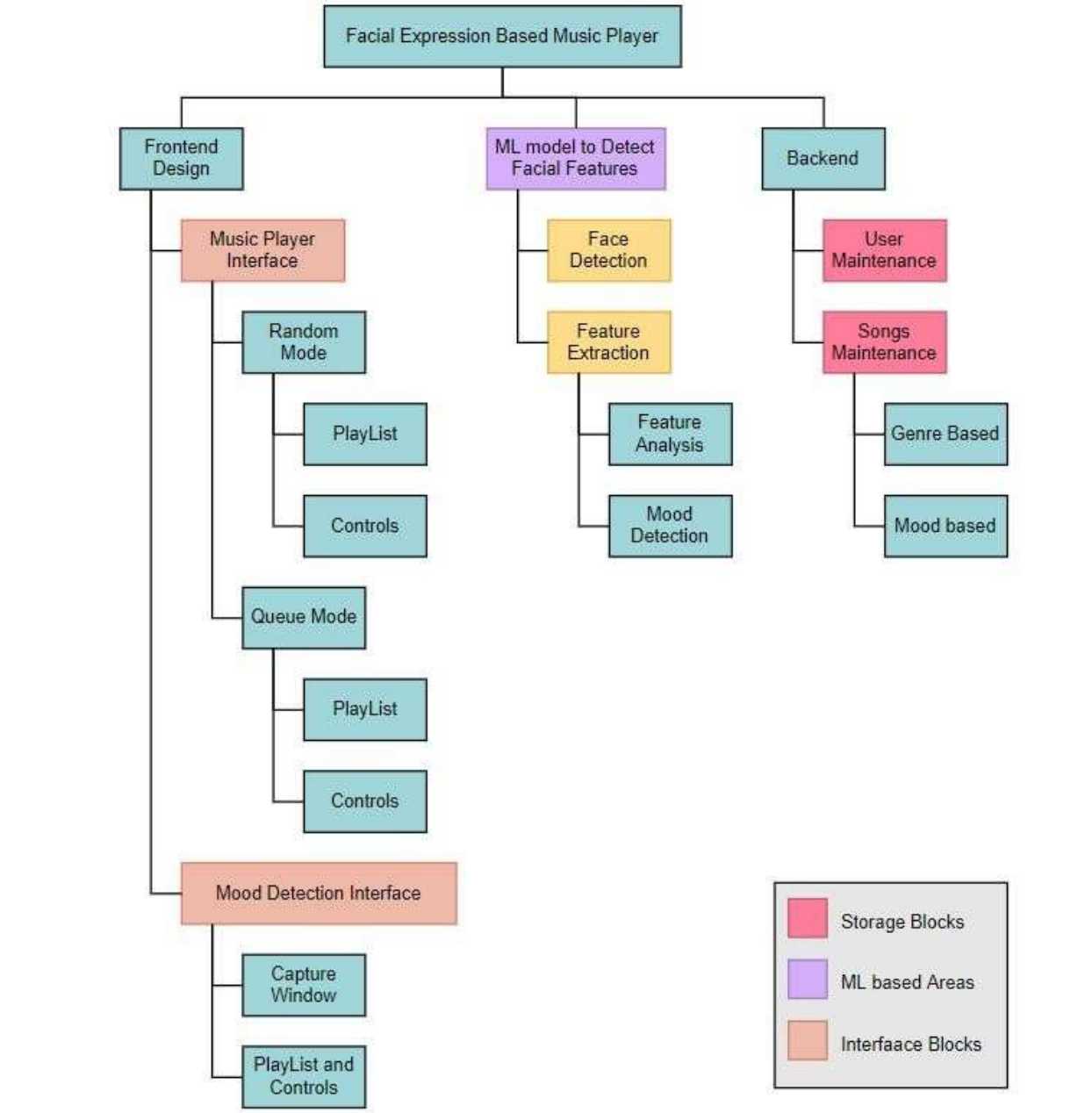
3.1 Functional Requirements:

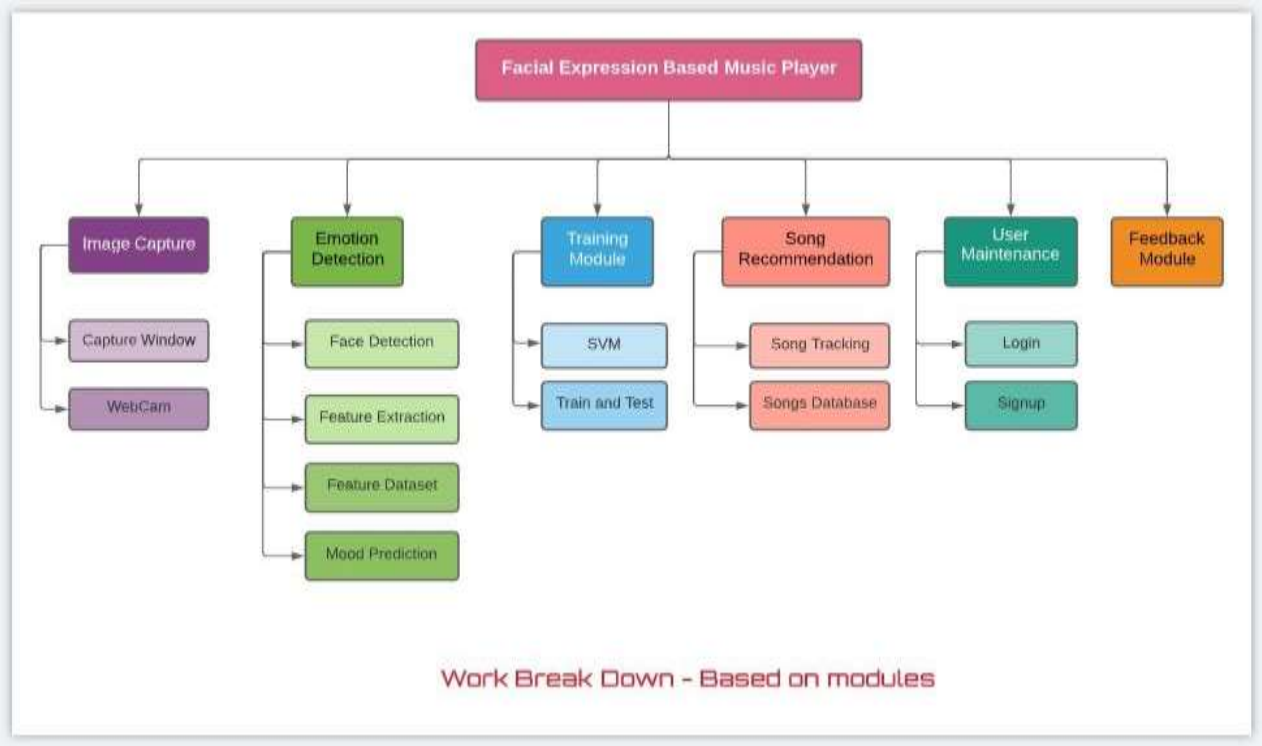
Title	Description
Image Capture	System to detect human face through a web cam and track the user.
Emotion Detection	The system will detect human emotions and classify them using SVM.
Training Module	To increase the accuracy of our model.
Song Recommendation	Suggests songs based on the emotion detected.
User Maintenance	Will keep track of users
Feedback Module	To get feedback from users

3.2 Non-functional requirements:

- Reliability - We'll include a regular mode, which helps users to use the app even in case of low network coverage.
- Maintainability - Every module is isolated. So, in case of any modifications other modules will not get affected.
- Extensibility - As modules are isolated any features can be added easily in future development.
- Simplicity - We'll make sure that users from all age groups can use our app easily.
- Resource Utilization – Use as few resources as we can so that users in low end devices can get a seamless experience.

Work Breakdown Structure:





Identifying Stakeholders:

This platform requires a variety of different stakeholders working to get her to provide users with the best experience, while simultaneously keeping the business alive by generating revenue.

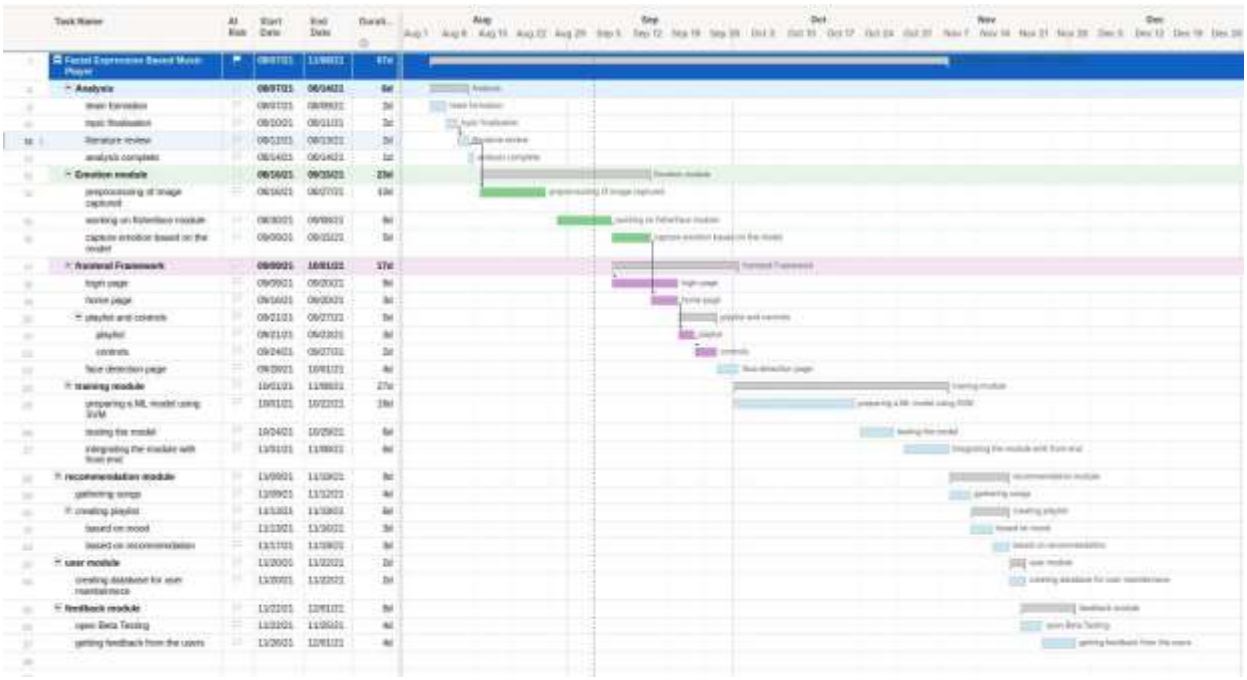
- **Service Stakeholders :** Advertisement companies to generate ad revenue. These are not the primary stakeholders but will be helpful to generate revenue.
- **External Stakeholders** : Individuals or groups outside of a business or project who can affect or be affected by the business or project are referred to as external stakeholders. Because they are generally the end users and consumers, they have the most influence on the long-term success of the business or project.

- **Users**-All the end users come under this.
- **Content creators –** Artists who are willing to use our platforms to make their albums exclusive.
- **Investors –** Investors wield most influence for the long term success of the business.

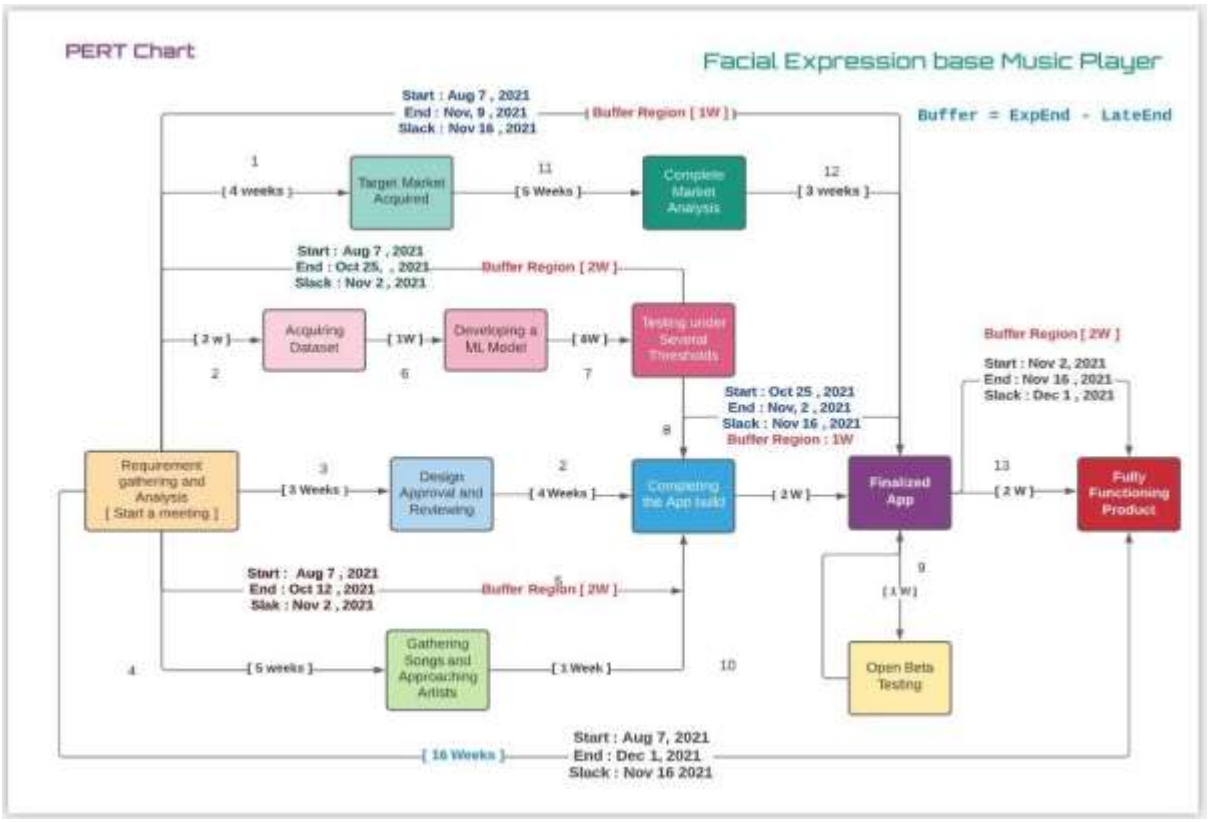
Community: Since the project is largely dependent on community effort, the community plays a key role in the stakeholders.

4.<u>Project Scheduling:</u>

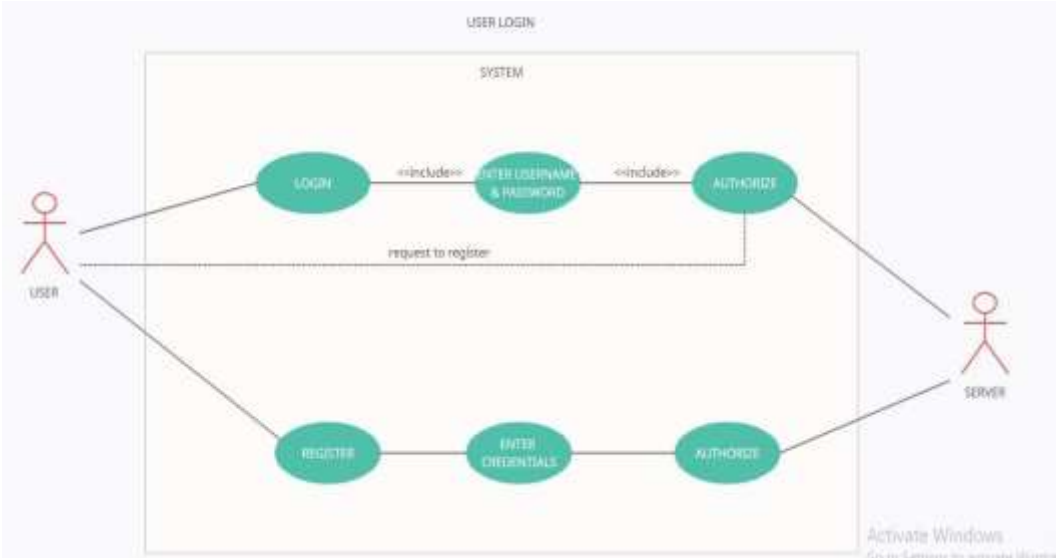
4.1 Gantt Chart:

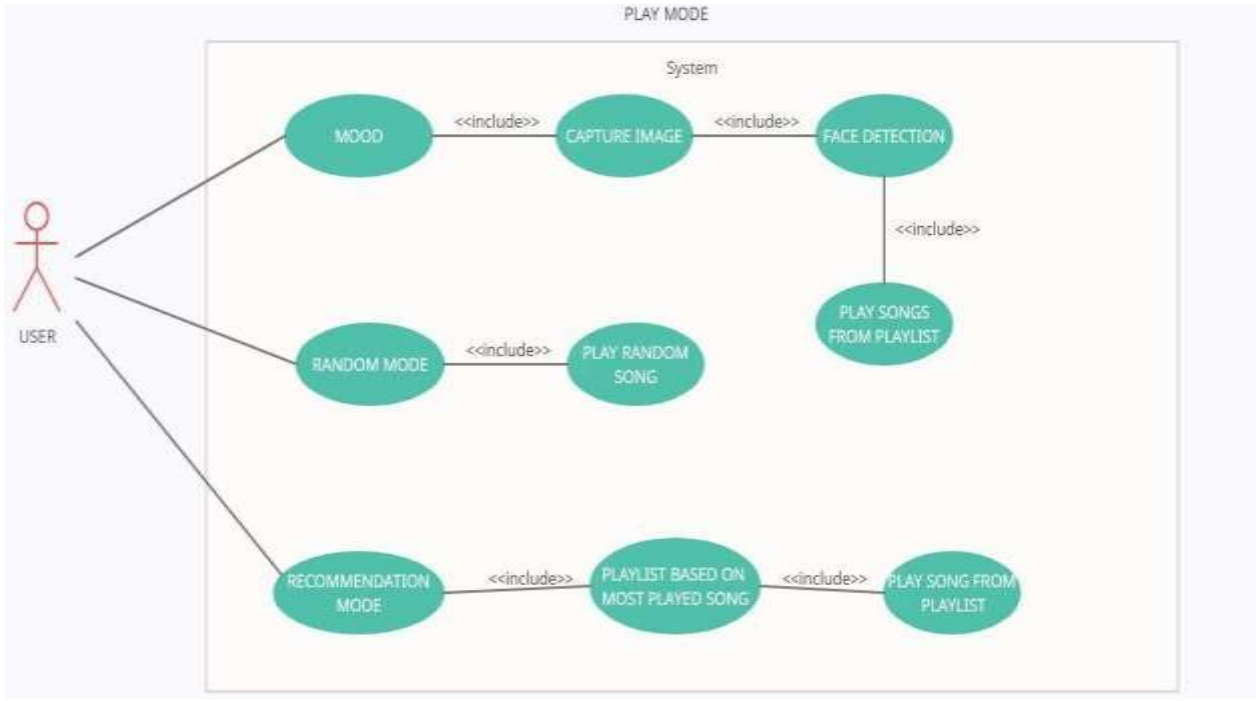


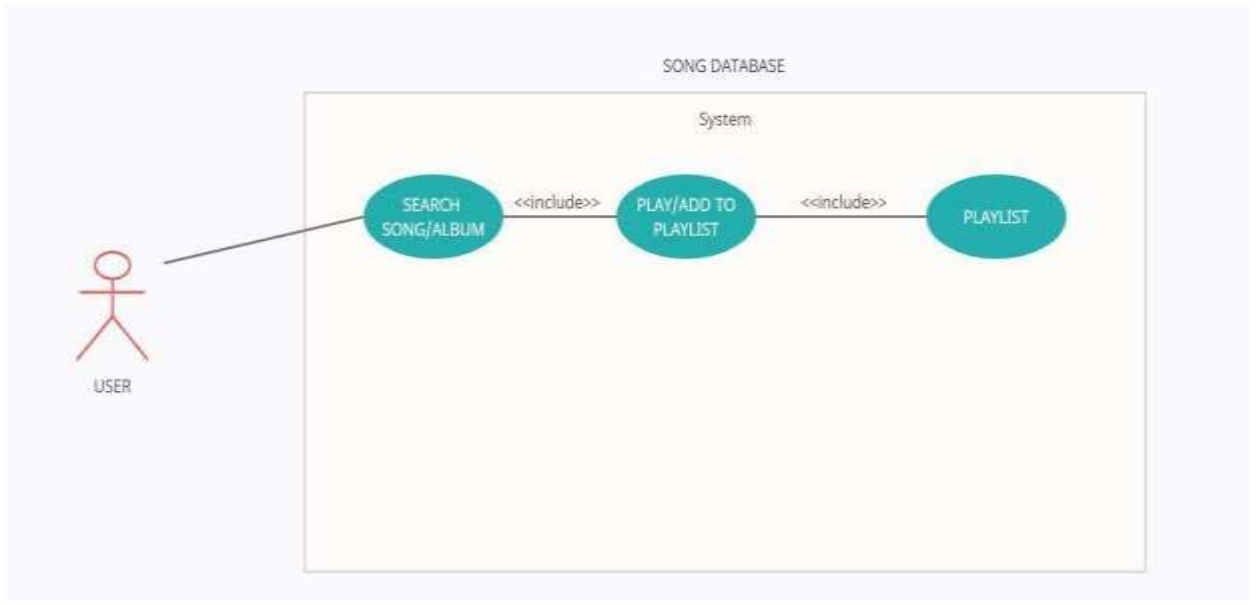
4.2 PERT CHART



Use-Case Diagram:




PLAY MODE
System
MOOD
<<include>>
CAPTURE IMAGE
<<include>>
FACE DETECTION
<<include>>
PLAY SONGS FROM PLAYLIST
USER
RANDOM MODE
<<include>>
PLAY RANDOM SONG
RECOMMENDATION MODE
<<include>>
PLAYLIST BASED ON MOST PLAYED SONG
<<include>>
PLAY SONG FROM PLAYLIST


SONG DATABASE
System
SEARCH SONG/ALBUM
<<include>>
PLAY/ADD TO PLAYLIST
<<include>>
PLAYLIST
USER

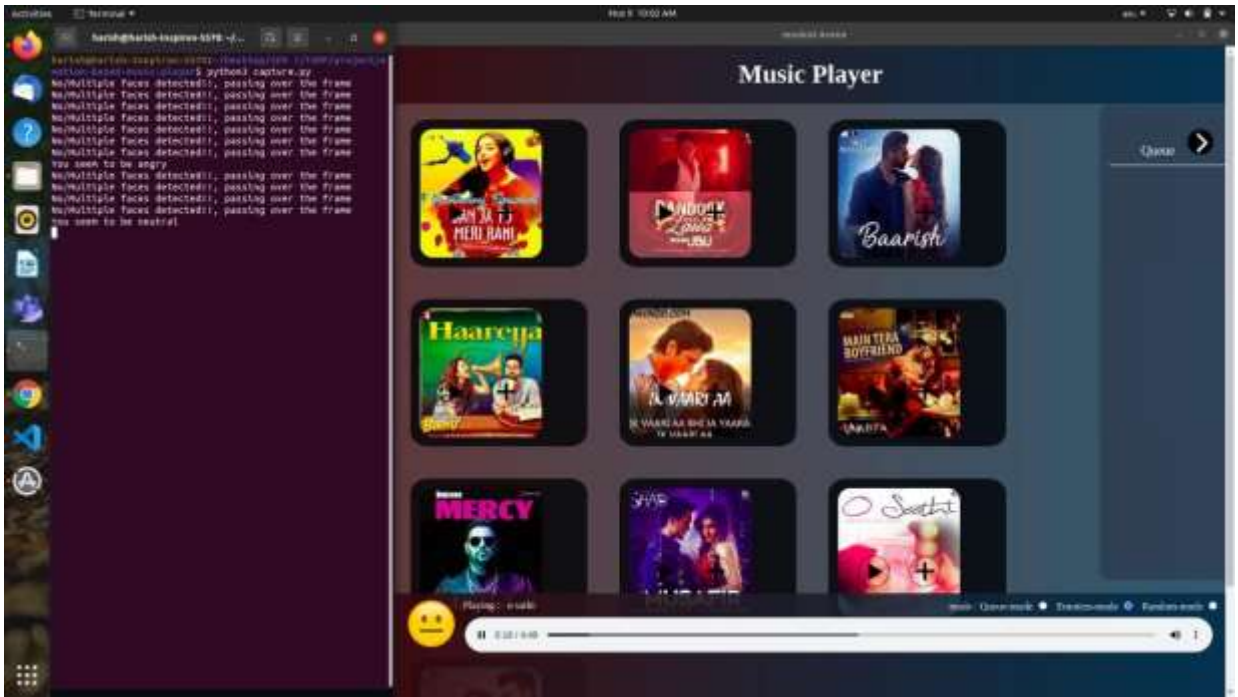
5 LiteratureReview:

Author	Title	Year of publication	Summary
S. Deebika, K. A.IndiraandJeslin e	A Machine Learning Based Music Player by Detecting Emotions	2019	This study involves the implementation of a Convolution Neural Network for emotion recognition and, as a result, the playback of a song. Multilayer perceptions are implemented by CNNs in order to achieve minimal processing. CNNs have been found to have little processing when compared to other image classification techniques. To improve visualization, we employ the back propagation training process to activate the filters. The mapping of emotion to a list of songs in accordance with the mood is done based on the emotion identified, and the song is then played. The PyCharm tool is used for analysis in this project.

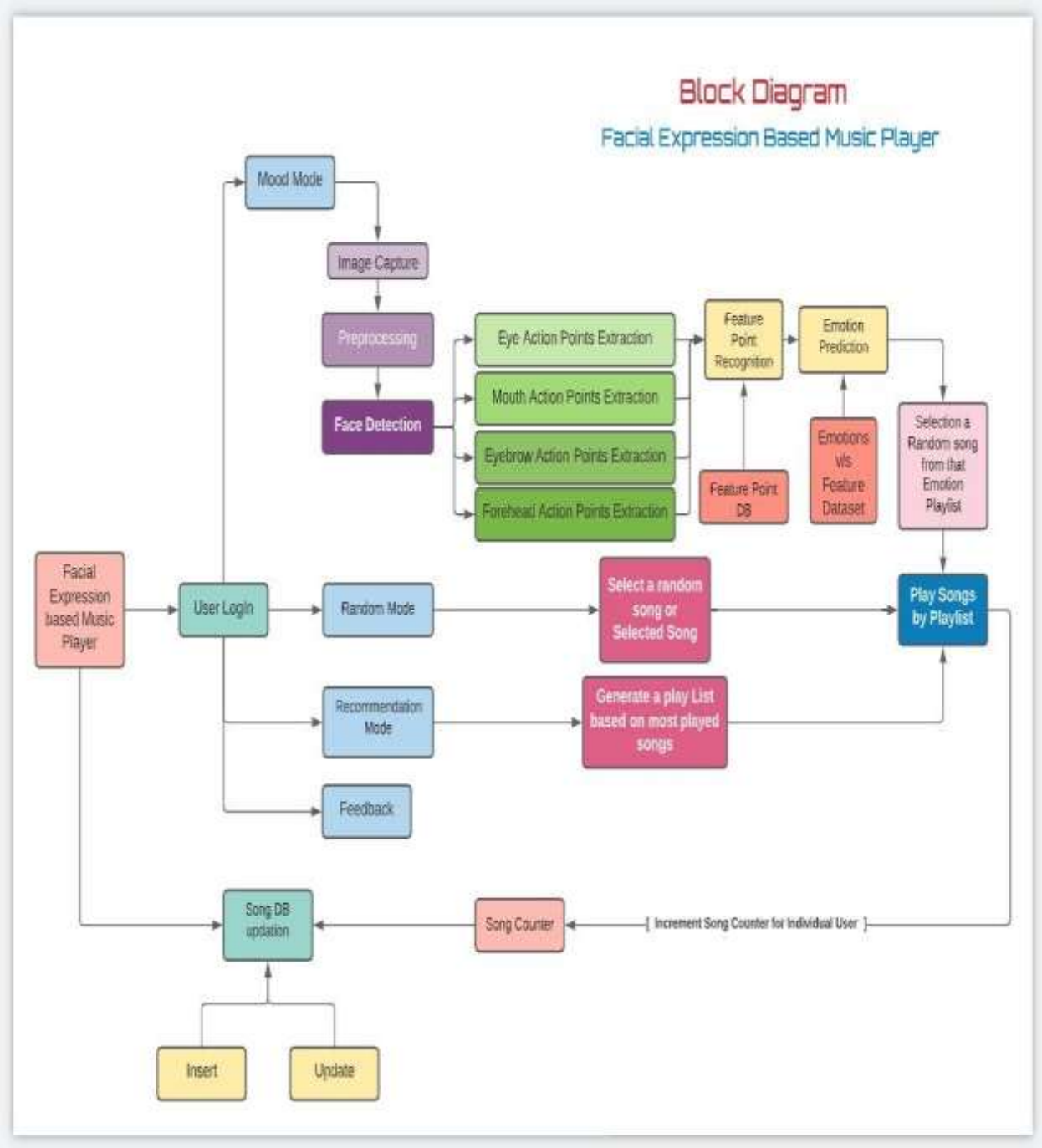
A. Arora, A. Kauland V.Mittal	Mood Based MusicPlayer	2019	This paper will investigate several classification algorithms in order to present a clear technique for I classifying songs into four mood categories and ii) detecting a user's mood through facial expressions, and then combining the two to create a user-tailored music playlist. Songs were categorised in two ways: by explicitly training models such as KNN, SVM, Random Forest, and MLP using selected audio features, and by predicting a song's arousal and valence values using these audio features.

Shlo kGil da,H usai nZaf ar,C hinta nSo ni,K shitij aWa ghur deka r	Smart music player integrating facial emotion and music mood recommendation	2017	The attributes of the user image are evaluated using a multi-layered convolutional neural network. An input layer, several convolutional layers, ReLU layers, pooling layers, and some dense layers (fully-connected layers), as well as an output layer, make up the convolutional neural network. We'll go over the technique for determining the mood mapping of each song. We'll use LibROSA, aubio pitch, and other cutting-edge audio extraction algorithms to extract the songs' acoustic properties. We'll train an artificial neural network based on these characteristics to successfully classify the music into four categories.
Ramya Raman athan;R adha Kumara n;R Ram Rohan; Rajat Gupta; Vishala kshiPra bhu	An Intelligent Music Player Based on Emotion Recognition	2017	To access the web camera of the computer in use, the system employs a video capture object. A web camera is used to capture several photos. We may need more than one facial image to effectively forecast the emotion. Blurred photos can be a source of mistake (particularly in low light settings), hence the many images are averaged to provide a blur-free image. Histogram equalization is an image processing technique that improves the image's contrast by leveling the image's range. This image is then cropped and transformed to grayscale, removing all ambiguity and leaving only the foreground of the image.

A. Alrihaili, A.Alsaedi,K. Albalawiand L.Syed	Music Recommender System for Users Based on Emotion Detection through Facial Features	2019	The suggested system detects emotions; if the subject is experiencing a bad feeling, a specific playlist will be supplied; if the detected emotion is positive, an appropriate playlist will be provided, which will comprise various forms of music to promote positive emotions. The suggested recommender system is implemented utilizing the Viola-Jones algorithm and Principal Component Analysis (PCA) methodologies, and we were able to successfully build it in MATLAB (R2018a).



6 PROPOSD METHODOLOGY DIAGRAM



6.1 Proposed Methodology Description:

The main aim of the project is to play the music according to the emotion of the user, which is detected from the facial expression of the User. This is made possible by using 2 technologies:

- One is the machine learning algorithms which are used to detect the emotion of the user from their facial expression, and
- The other one is the web development tools for developing the UI or frontend of the music player.

The music player opens with an interactive UI and offers 3 modes for the user to select from.

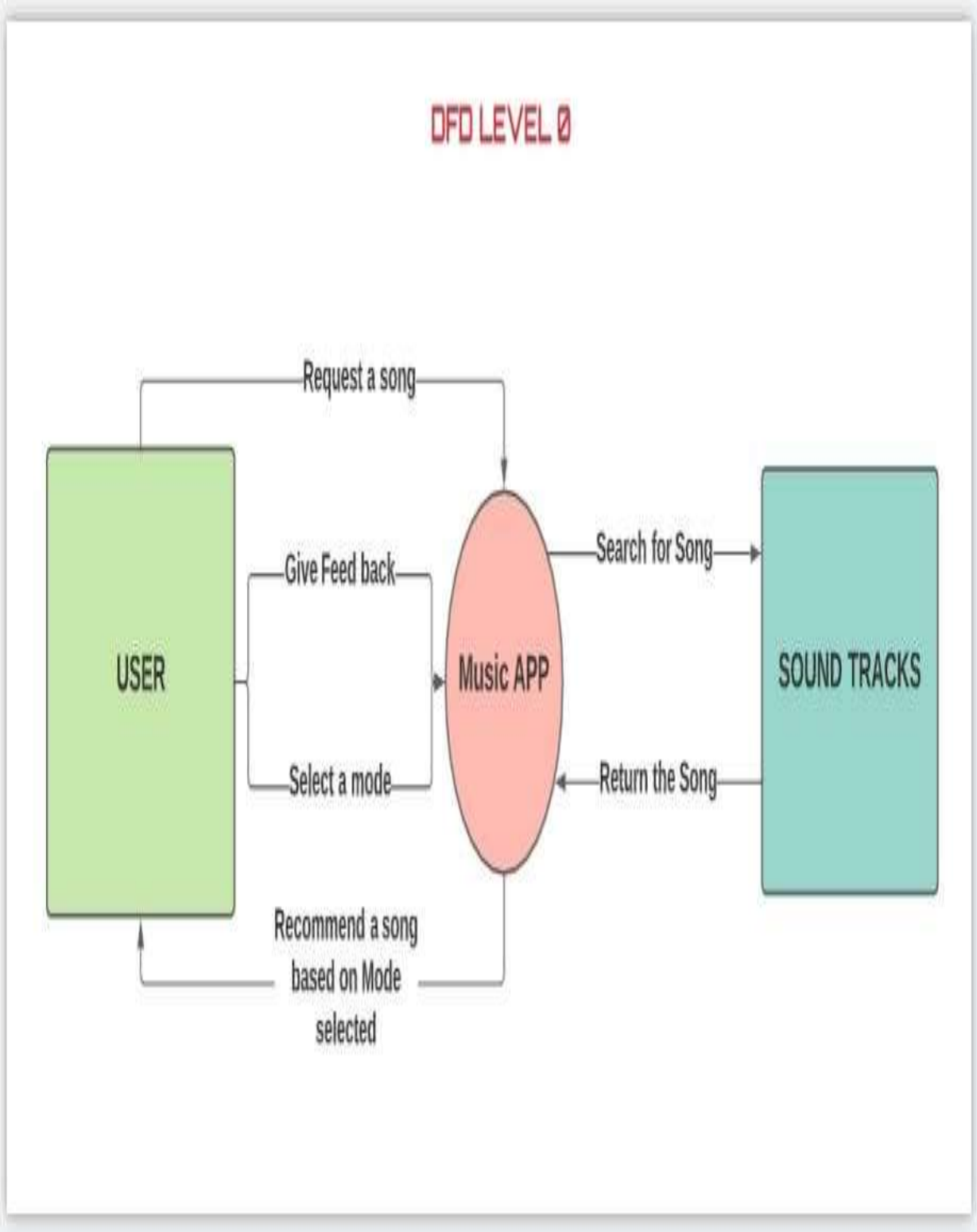
1. Random mode
2. Emotion mode
3. Queue mode.

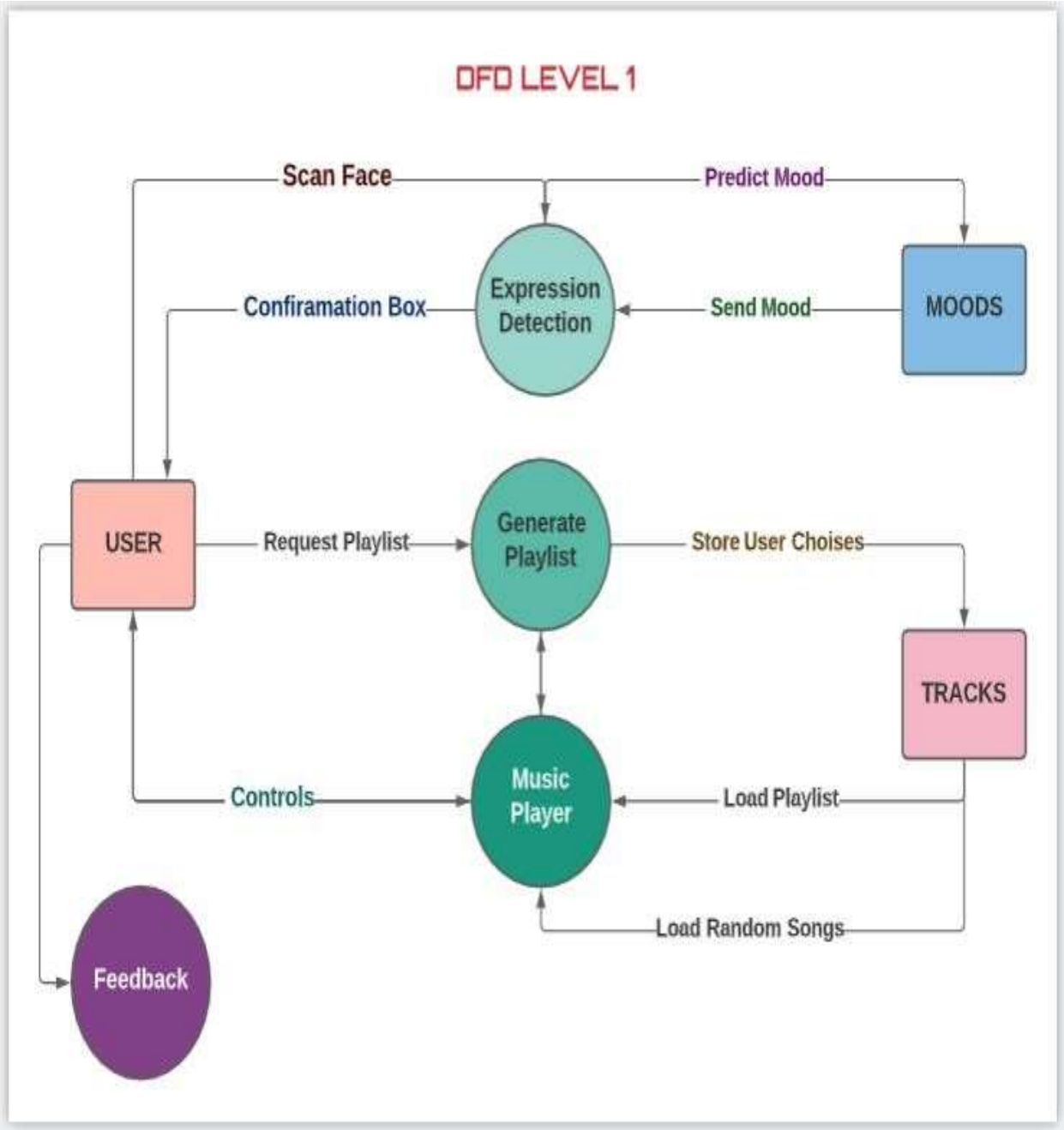
- In Random mode the music is played randomly irrespective of the emotion. In queue mode the music is played according to the playlist defined by the user. The main feature of the project is the emotion mode in which the music is played according to the emotion of the user. As soon as the user selects the emotion mode the algorithm accesses the device's camera and using the OpenCV library of python the image of the user is captured and sent to the algorithm for emotion analysis.

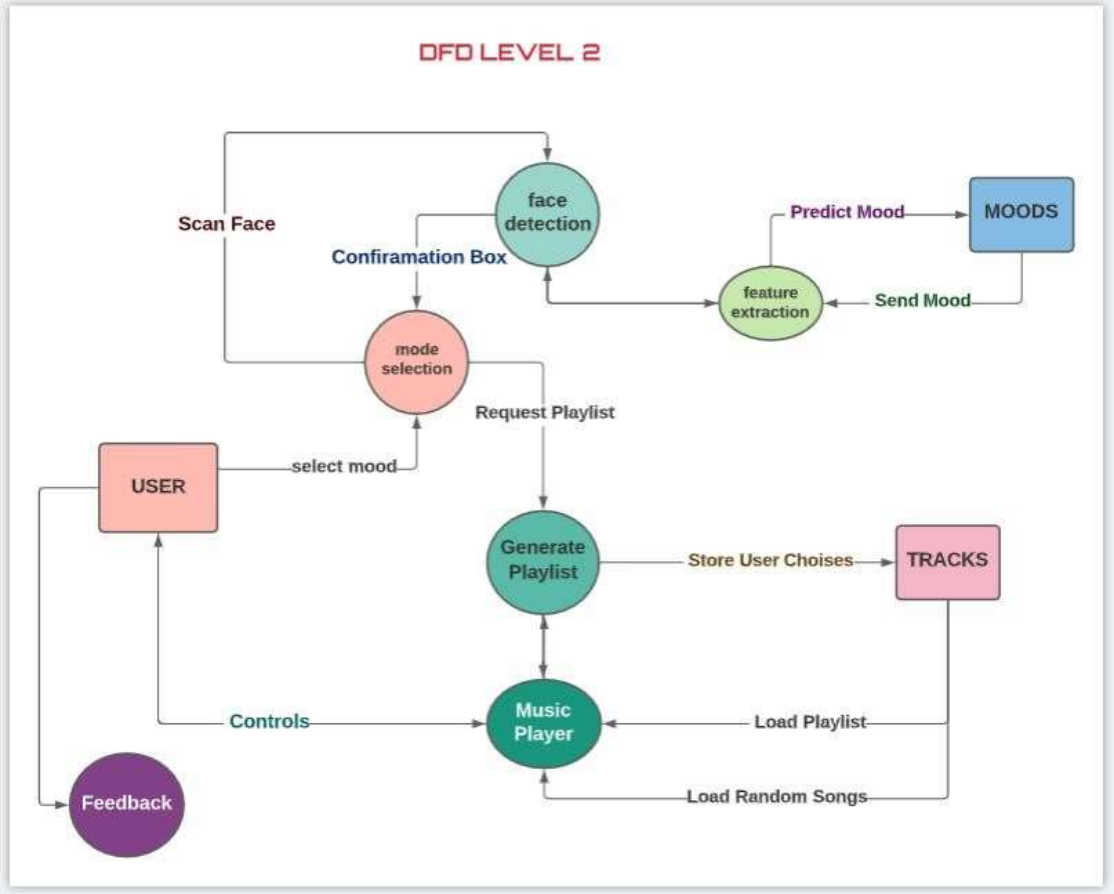
- The image captured is first grayscale and resized so as to predict the facial expression from the trained model. Then the trained model xml file is loaded for the Fisher face module which will predict the emotion of the user. The Fisher face module works by analyzing images then it will reduce the dimension of the data by calculating its statistical value according to the given categories and stores the numeric values in an xml file. While prediction it also calculates the same for a given image and compares the value with the computed dataset values and gives the corresponding result with confidence value. The emotion is then predicted by the algorithm in the categories of Neutral, Happy, Sad and angry. This is the working methodology of the back end that we have designed.

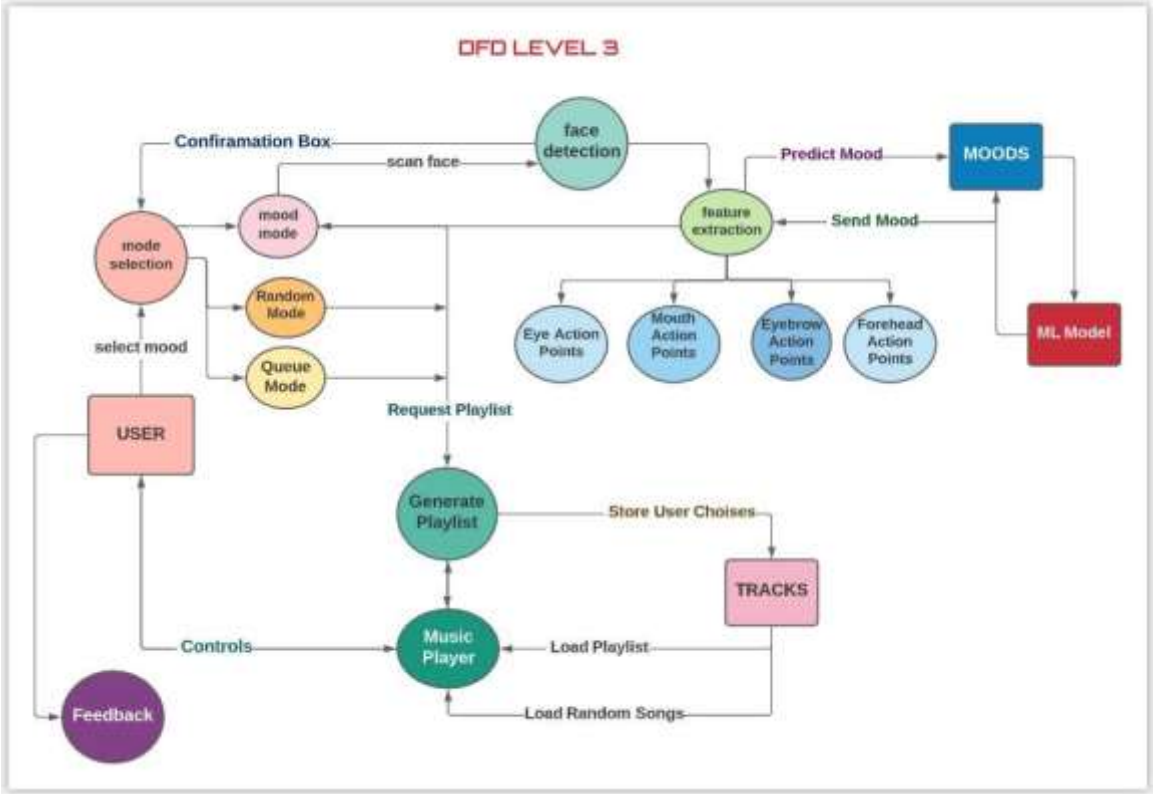
- For the User interface the music player is designed by using technologies such as HTML, CSS and JS. The UI is designed in an interactive format with users given the choice to choose from 3 different modes. When the user selects the Emotion mode the camera captures the image of the User and sends it to the back end algorithm. The emotion detected is retrieved from the backend and then the music is being played accordingly.

6.2 DATAFLOW DIAGRAM(DFD)



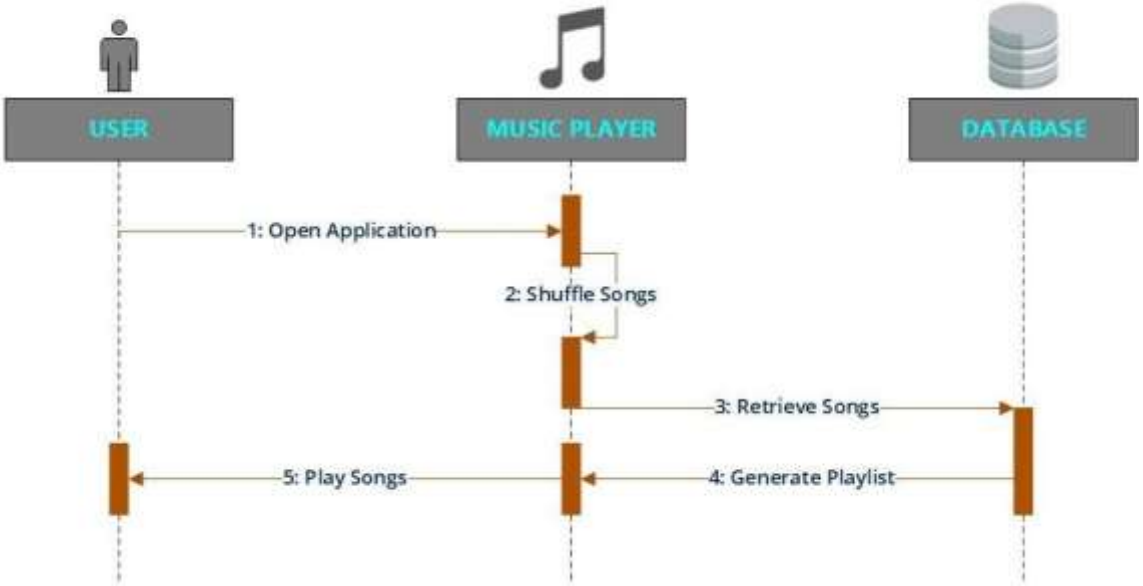

DFD LEVEL 1
Scan Face
Predict Mood
Expression Detection
Confiramation Box
Send Mood
MOODS
USER
Request Playlist
Generate Playlist
Store User Choises
TRACKS
Controls
Music Player
Load Playlist
Load Random Songs
Feedback


DFD LEVEL 2
face detection
Scan Face
Confiramation Box
Predict Mood
MOODS
feature extraction
Send Mood
mode selection
Request Playlist
USER
select mood
Generate Playlist
Store User Choises
TRACKS
Music Player
Controls
Load Playlist
Feedback
Load Random Songs


DFD LEVEL 3
Confiramation Box
face detection
scan face
Predict Mood
MOODS
mood mode
feature extraction
Send Mood
mode selection
Random Mode
Queue Mode
Eye Action Points
Mouth Action Points
Eyebrow Action Points
Forehead Action Points
ML Model
select mood
USER
Request Playlist
Generate Playlist
Store User Choises
TRACKS
Controls
Music Player
Load Playlist
Feedback
Load Random Songs

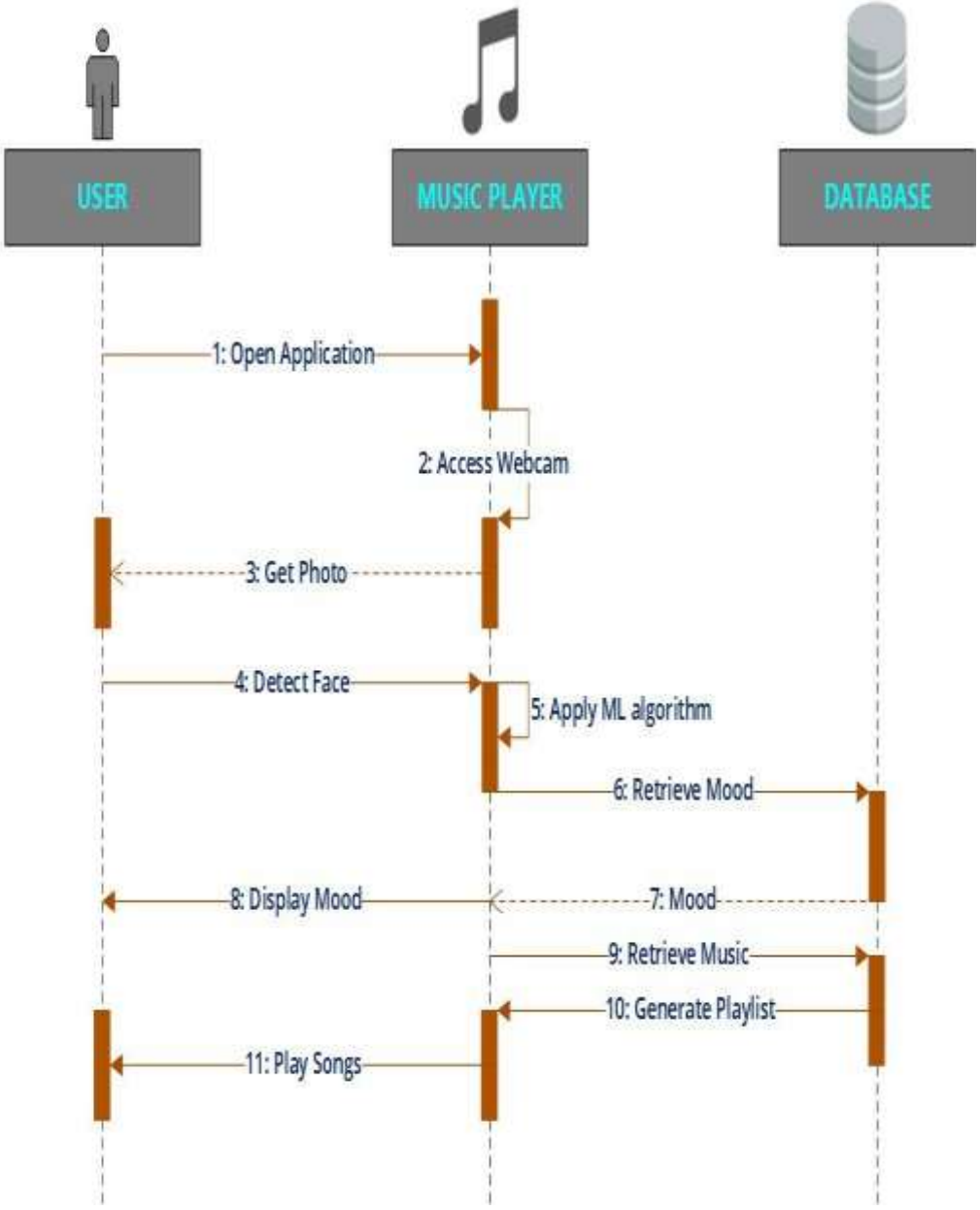
SEQUENCE DIAGRAM

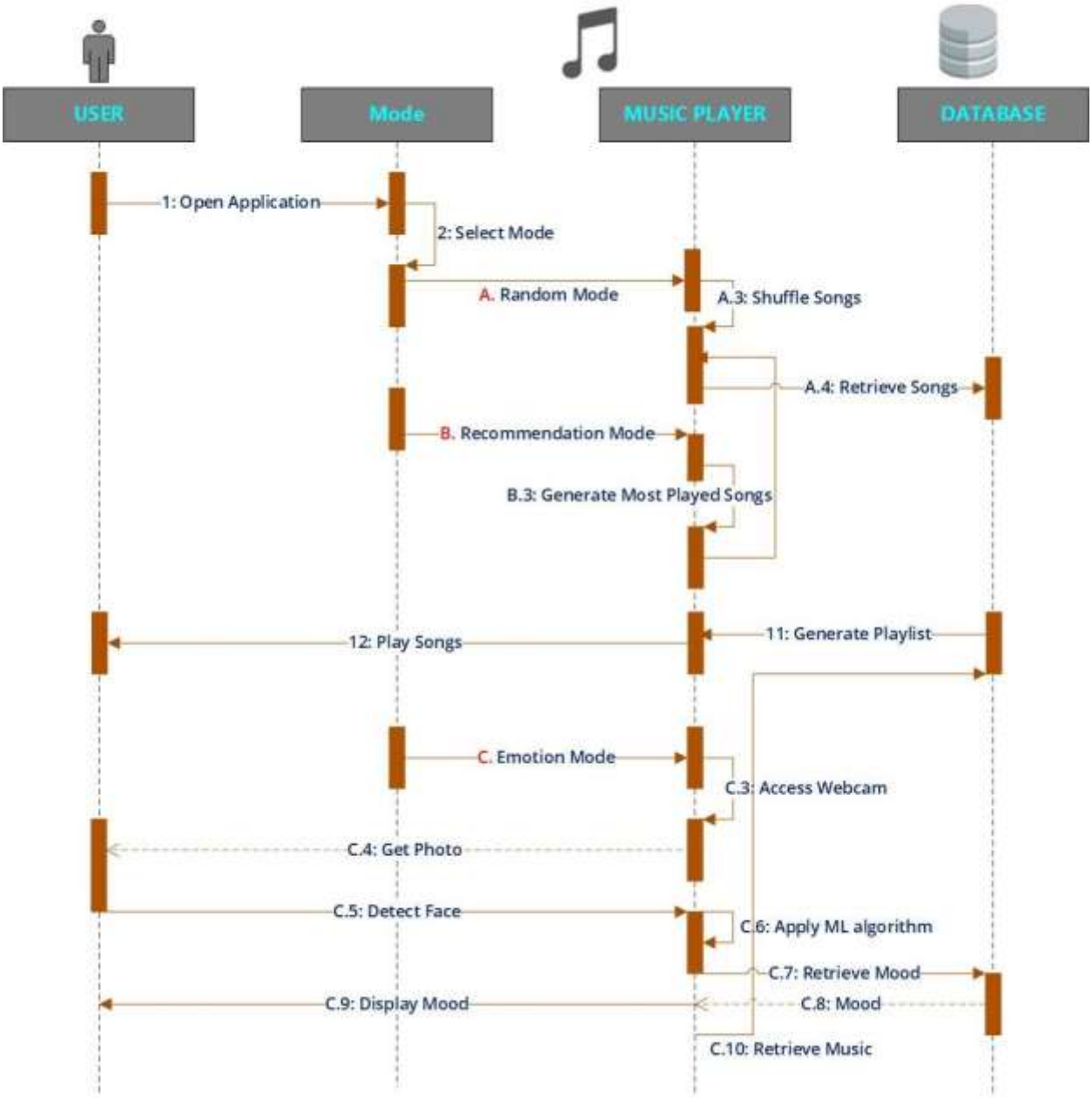
Random Mode



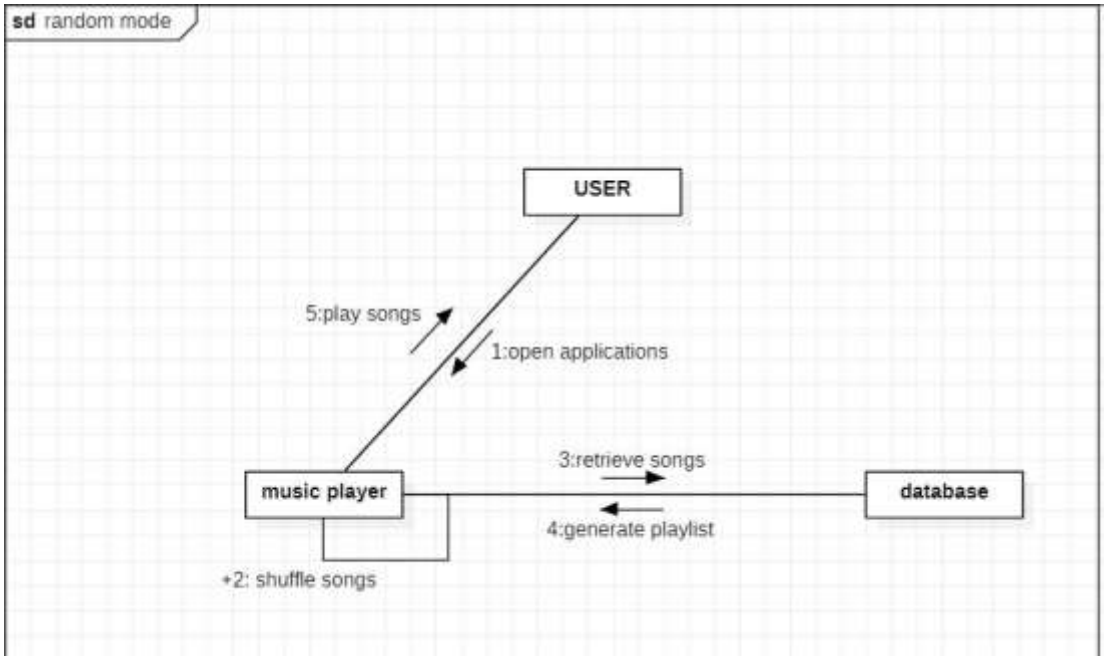
Recommendation Mode

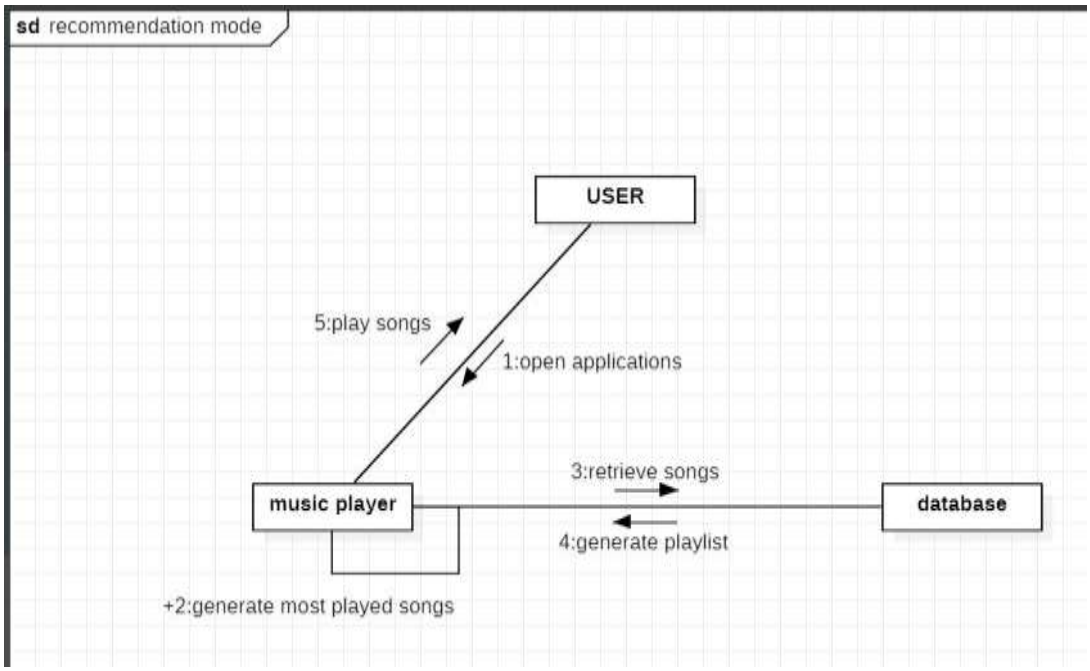
Emotion Mode

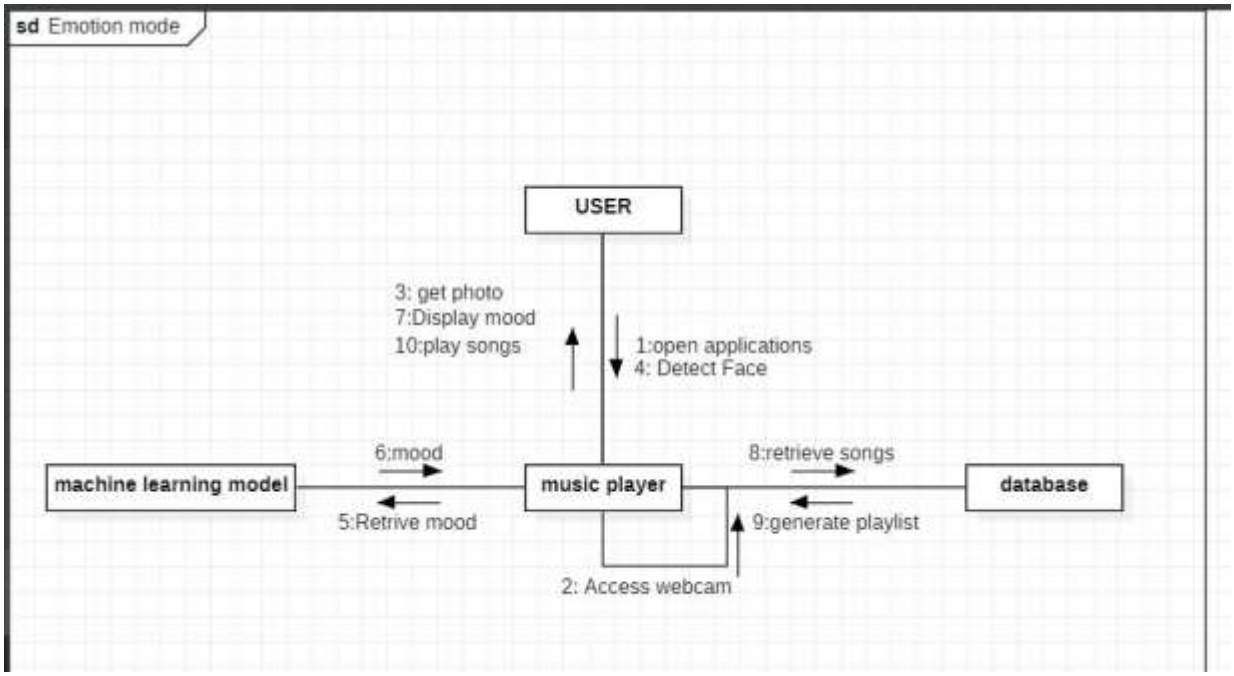



All-In-One
USER
Mode
MUSIC PLAYER
DATABASE
1: Open Application
2: Select Mode
A. Random Mode
A.3: Shuffle Songs
A.4: Retrieve Songs
B. Recommendation Mode
B.3: Generate Most Played Songs
12: Play Songs
11: Generate Playlist
C. Emotion Mode
C.3: Access Webcam
C.4: Get Photo
C.5: Detect Face
C.6: Apply ML algorithm
C.7: Retrieve Mood
C.9: Display Mood
C.8: Mood
C.10: Retrieve Music

COLLABORATION DIAGRAM

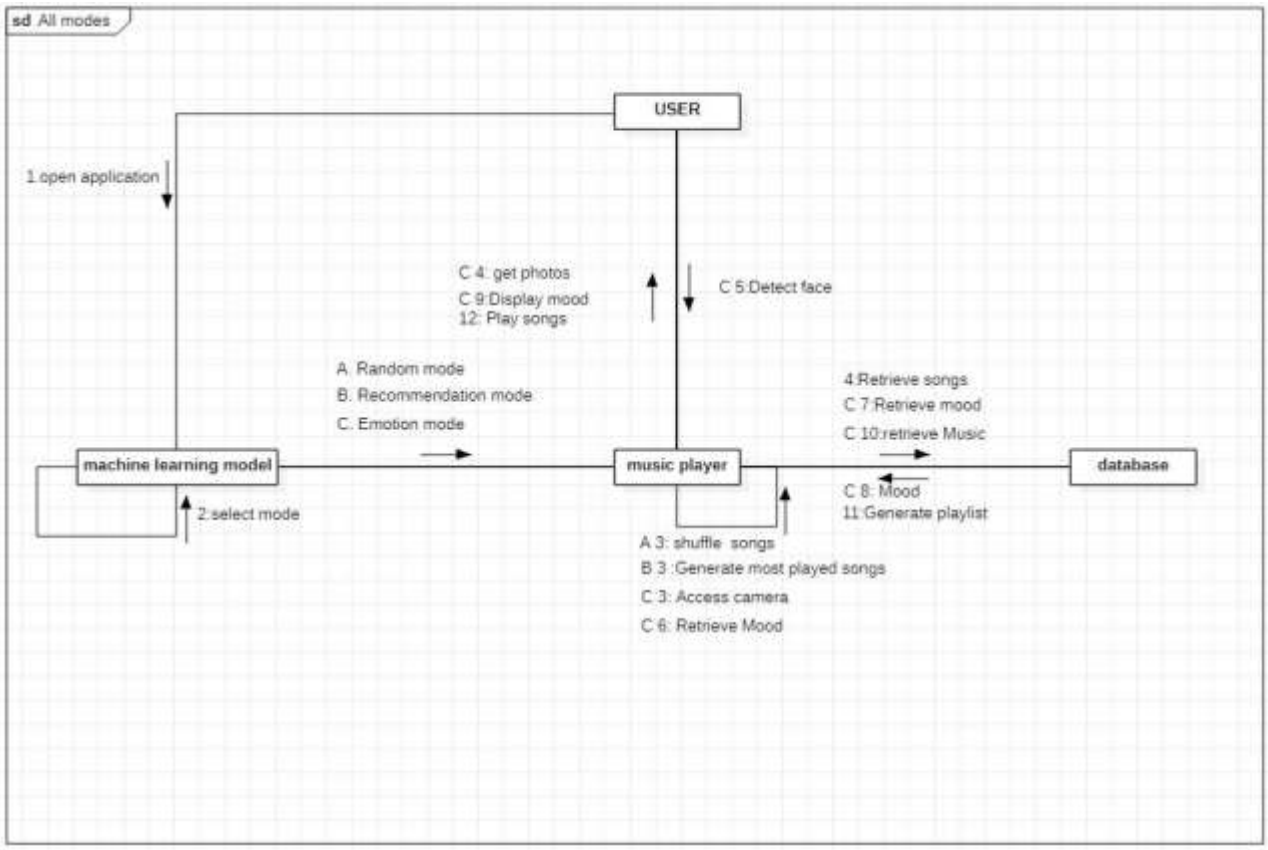




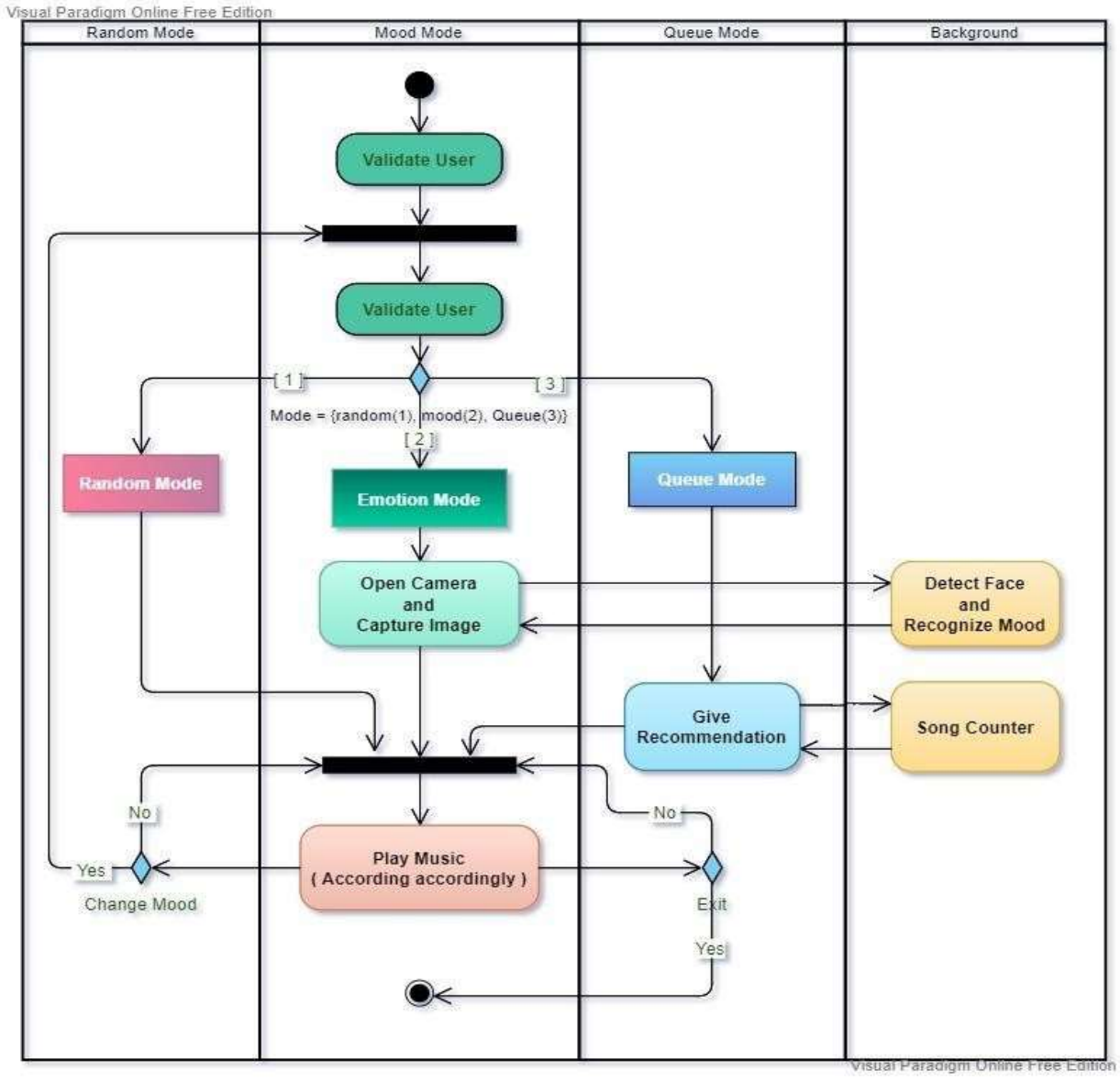


COLLABORATION DIAGRAM

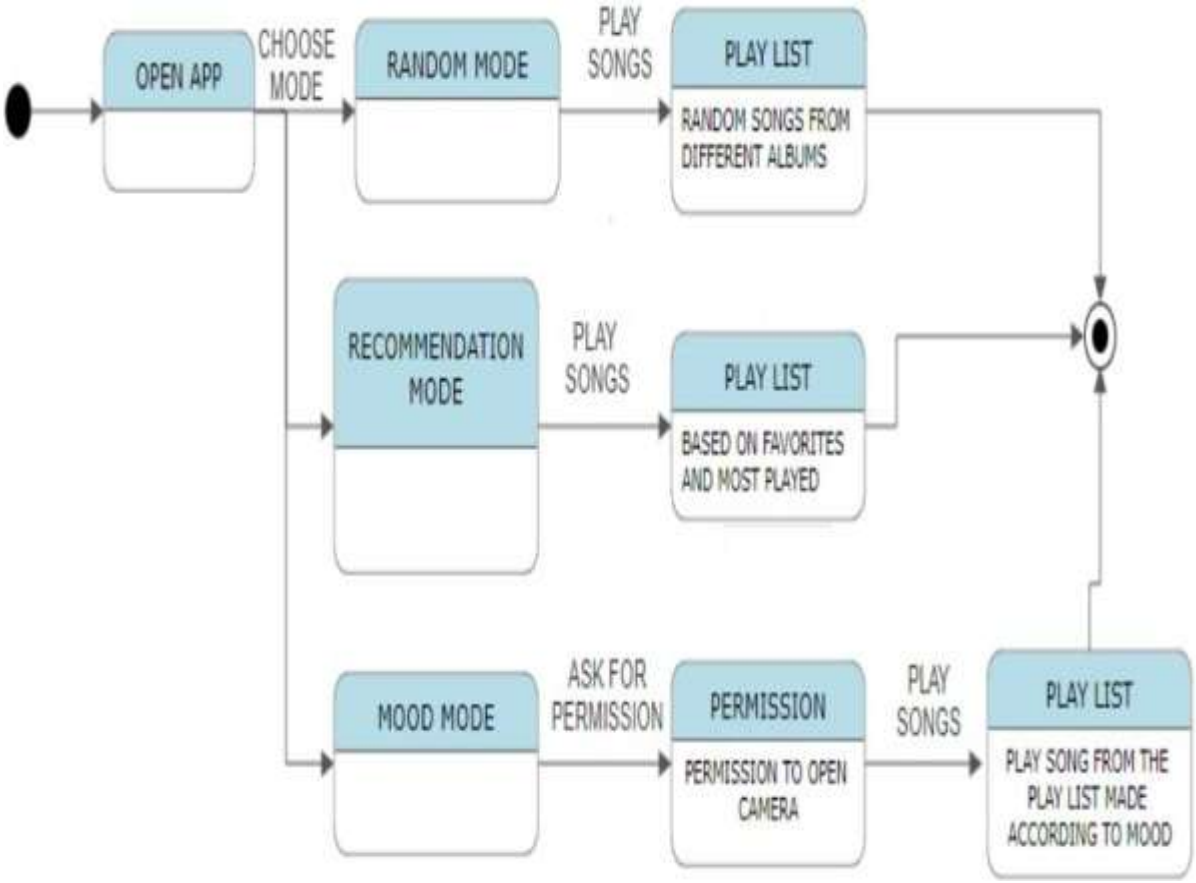
(All three modes combined)



ACTIVITY FLOW DIAGRAM:



State chart


OPEN APP
CHOOSE MODE
RANDOM MODE
PLAY SONGS
PLAY LIST
RANDOM SONGS FROM DIFFERENT ALBUMS
RECOMMENDATION MODE
PLAY SONGS
PLAY LIST
BASED ON FAVORITES AND MOST PLAYED
MOOD MODE
ASK FOR PERMISSION
PERMISSION
PERMISSION TO OPEN CAMERA
PLAY SONGS
PLAY LIST
PLAY SONG FROM THE PLAY LIST MADE ACCORDING TO MOOD

USER INTERFACE DIAGRAM

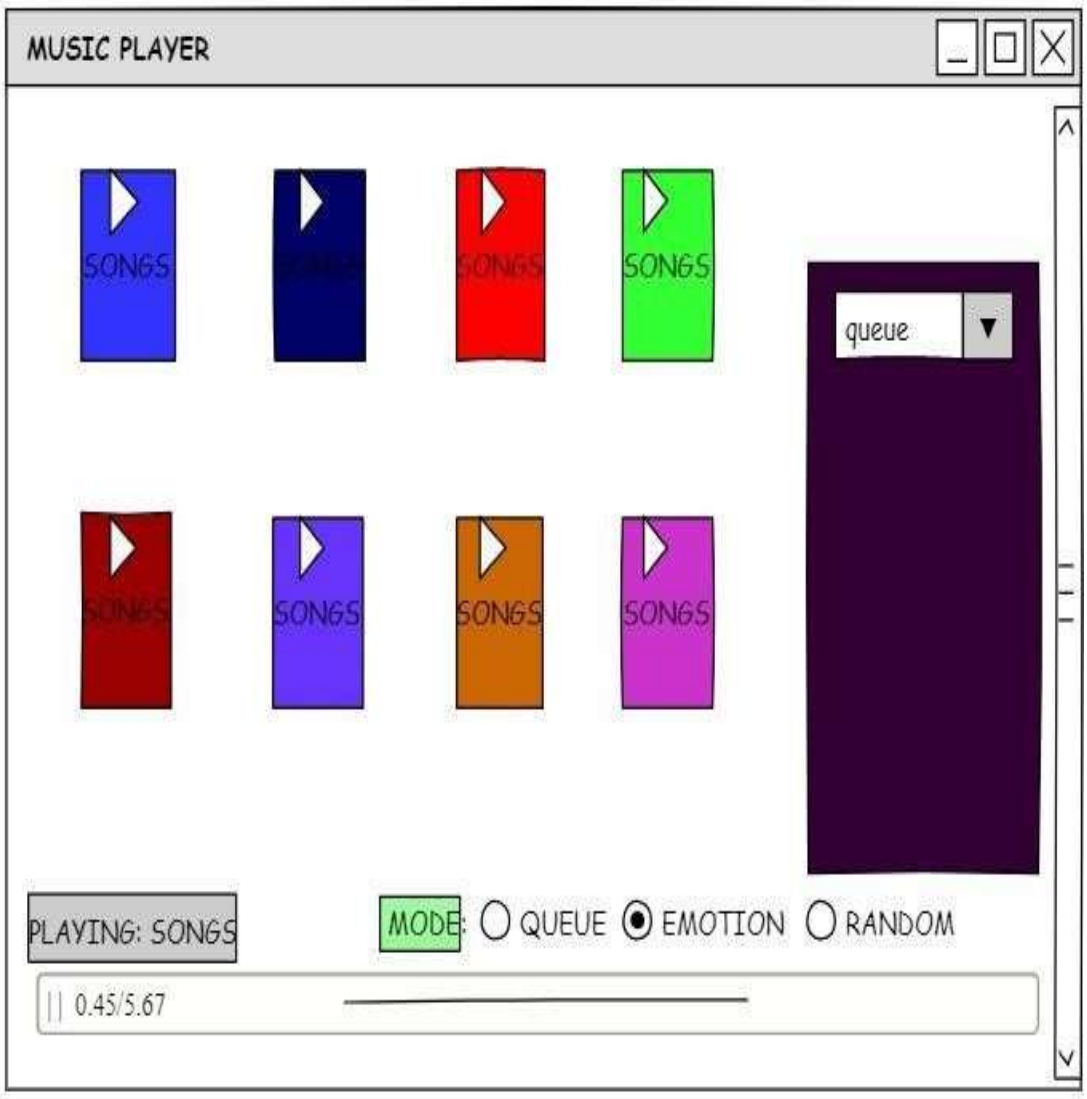


Fig: 1 (User Interface of Music Player)

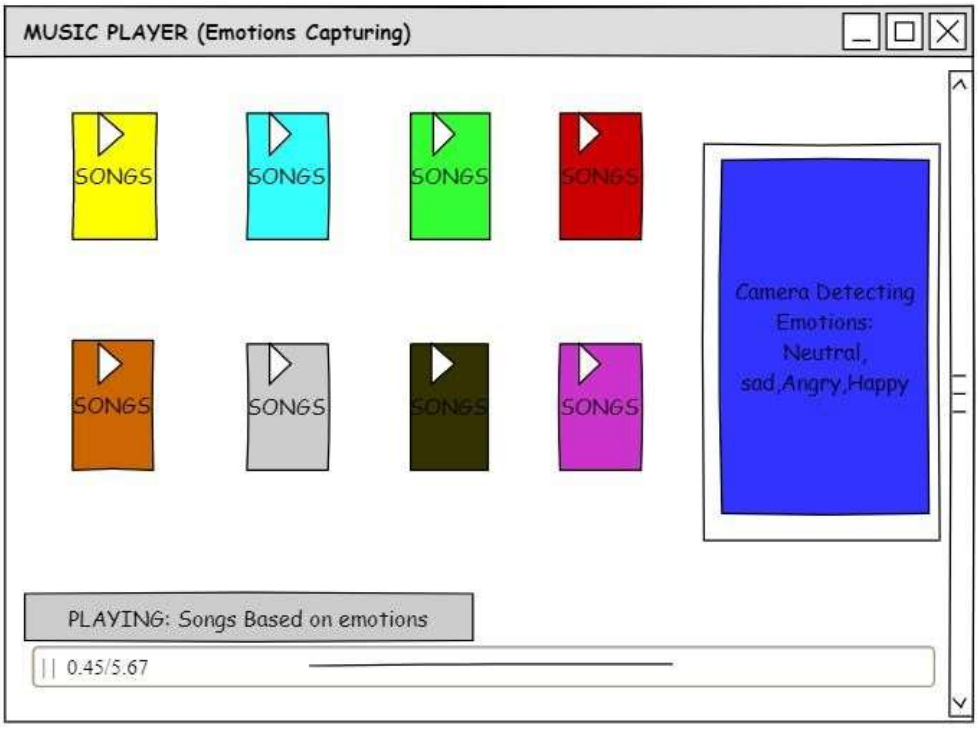


Fig: 2 (Emotions Capturing Interface of Music Player)

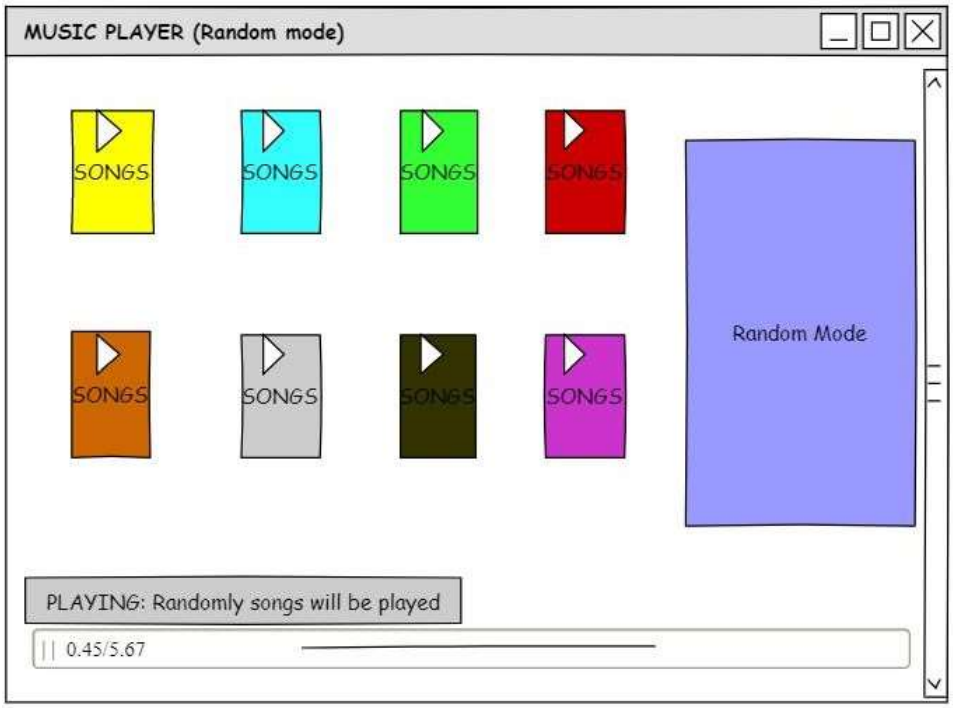


Fig: 3 (random mode Interface of Music Player)

Proposed Methodology:

The main aim of the project is to play the music according to the emotion of the user, which is detected from the facial expression of the User.

This is made possible by using 2 technologies: one is the machine learning algorithms which are used to detect the emotion of the user from their facial expression, and the other one is the web development tools for developing the UI or frontend of the music player. The music player opens with an interactive UI and offers 3 modes for the user to select form i.e.

1. Random mode
2. Emotion mode
3. Queue mode.

In Random mode the music is played randomly irrespective of the emotion. In queue mode the music is played according to the playlist defined by the user. The main feature of the project is the emotion mode in which the music is played according to the emotion of the user. As soon as the user selects the emotion mode the algorithm accesses the device's camera and using the OpenCV library of python the image of the user is captured and sent to the algorithm for emotion analysis.

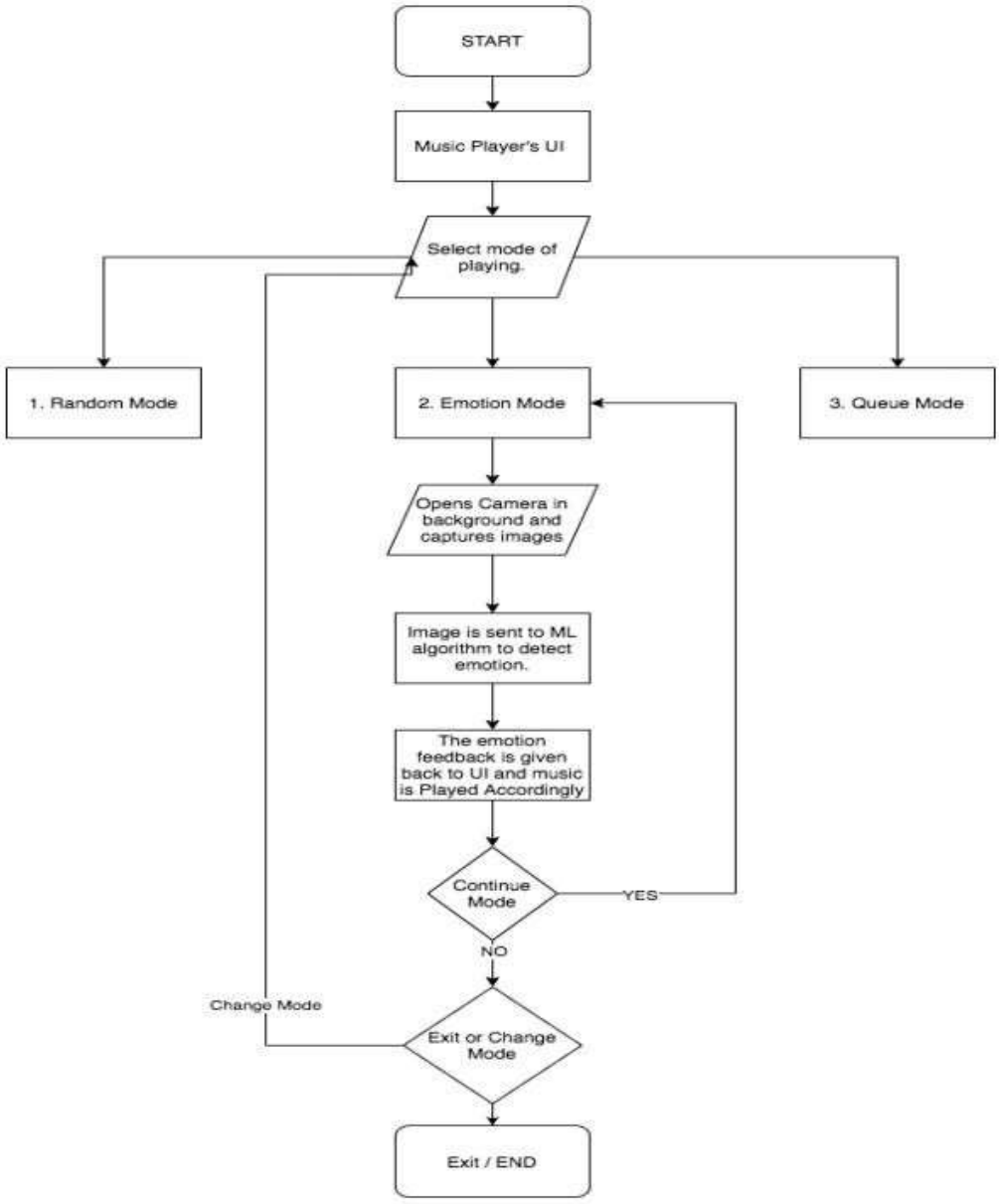
The image captured is first grayscale and resized so as to predict the facial expression from the trained model of the haar cascade which is trained from the frontal face data. Then the trained model xml file is loaded for the fisherface module which will predict the emotion of the user.

The Fisherface module analyses photographs before reducing the data's dimension by calculating its statistical value based on the provided categories and saving the numeric values in an xml file. While predicting, it also computes the same for a given image, compares the value to the computed dataset values, and returns a result with a confidence value.

The emotion is then predicted by the algorithm in the categories of Neutral, Happy, Sad and angry. This is the working methodology of the backend that we have designed. For the User interface the music player is designed by using technologies such as HTML, CSS and JavaScript. The UI is designed in an interactive format with users given the choice to choose from 3 different modes.

When the user selects the Emotion mode. The camera captures the image of the User and sends it to the backend algorithm.

The machine learning algorithm and the web based interface is being linked y using the EEL library of python which allows to integrate the functions of python in JavaScript and vice-versa. The emotion detected is retrieved from the backend and then the music is being played accordingly.


START
Music Player's UI
Select mode of playing.
1. Random Mode
2. Emotion Mode
3. Queue Mode
Opens Camera in background and captures images
Image is sent to ML algorithm to detect emotion.
The emotion feedback is given back to UI and music is Played Accordingly
Continue Mode
YES
NO
Change Mode
Exit or Change Mode
Exit / END

7. IMPLEMENTATION

7.1 CODE:

```
var songrun=false;
var count=1;
var mod=1;
var path=["songs\\ban ja rani.mp3"
,"songs\\Banduk meri laila.mp3"
,"songs\\barish.mp3"
,"songs\\haareya.mp3"
,"songs\\ik vari aa.mp3"
,"songs\\main tera.mp3"
,"songs\\mercy.mp3"
,"songs\\musafir.mp3"
,"songs\\o sathi.mp3"
,"songs\\phir bhi.mp3"];

var sname=["Ban Ja tu meri Rani",
"Banduk Meri Laila",
"Barish",
"Haareya",
"Ik vari aa",
"main tera boyfriend",
"mercy",
"musafir",
"o sathi",
"Phir Bhi"
];

var sd=["Artist: Guru Randhawa<br>Movie: Tumhari Sulu<br>Released: 2017",
"Artists: Ash King, Jigar Saraiya<br>Featured artists: Sidharth Malhotra, Raftaar<br>Movie: A Gentleman<br>Released: 2017"
,"Artists: Ash King, Shashaa Tirupati<br>Movie: Half Girlfriend<br>Released: 2017<br>Awards: Zee Cine Award for Song of the Year"
,"Artist: Arijit Singh<br>Movie: Meri Pyaari Bindu<br>Released: 2017<br>Nominations: Mirchi Music Awards for Best Song Producer - Programming & Arranging"
,"Artist: Arijit Singh<br>Movie: Raabta<br>Released: 2017"
,"Artists: Arijit Singh, Neha Kakkar, Meet Bros<br>Movie: Raabta<br>Released: 2017<br>Composer(s): : Sohrabbudin (Original); Sourav Roy (Revamped).<br>Genre: Dance music"
,"Artist: Badshah<br>Released: 2017<br>Nominations: Mirchi Music Awards for Best Song Engineer - Recording and Mixing"
,"Artist: KK<br>Movie: Shab<br>Released: 2017"
,"Artist: Arijit Singh<br>Movie: Shab<br>Released: 2017"
,"Artists: Arijit Singh, Shashaa Tirupati<br>Movie: Half Girlfriend<br>Released: 2017<br>Written: 2001 (lyrics)<br>Lyricist(s): Manoj Muntashir<br>Composer(s): Mithoon"];

var bool=[];
```

```
for(var i=0; i<sd.length; i++)
      bool[i]=false;

var icon=["images\\\\1.jpg",
"images\\\\2.jpg",
"images\\\\3.jpg",
"images\\\\4.jpg",
"images\\\\5.jpg",
"images\\\\6.jpg",
"images\\\\7.jpg",
"images\\\\8.jpg",
"images\\\\9.jpg",
"images\\\\10.jpg"];

var mood=[["1","2","3"],["4","5"],["6","7","8"],["9","10"]];
var mmm=["1.png","1.png","1.png","2.png","2.png","3.png","3.png","3.png","4.png","4.png"];

var songs=new Array(icon.length);
for (var i = 0; i<icon.length; i++) {
      songs[i]=new Array(4);
      songs[i][0]=path[i];
      songs[i][1]=sd[i];
      songs[i][2]=icon[i];
      songs[i][3]=mmm[i];
      console.log(songs[i][0]);
      console.log(songs[i][1]);
      console.log(songs[i][2]);
      var ins=document.createElement("div");
      ins.id='b'+i;
      //ins.onclick=function(){
      //next(this);
      //};
      ins.setAttribute("class", "song");
      document.body.appendChild(ins);
      document.getElementById('b'+i).innerHTML='<div id="pic" style=\'background-image: url(\"'+songs[i][2]+'\");\'>  <input type="button" id="'+"a"+i+'" class="play" > <input type="b
      document.getElementById('a'+i).onclick=function(){
            play(this);
      };
```

```
	document.getElementById('c'+i).onclick=function(){
		addq(this);
	};
}



function setmod(elem){
	mod=elem.value;
	if(!songrun){
		if(mod==2)
			getTime();
		if(mod==3)
			rand_play();
	}
}

function play(elem){
	console.log(elem.id);
	var x=elem.id.charAt(1);
	var z=songs[x][0];
	document.getElementById("sname").innerHTML=sname[x];
	document.getElementById("sel").src= z;
	document.getElementById("main_slider").load();
	document.getElementById("main_slider").play();
	document.getElementById("emoji").style.backgroundImage="url('"+songs[x][3]+"')";
	songrun=true;

}

var eqc=1;
var sqc=1;

function addq(elem){
	console.log(elem.id);
	var x=elem.id.charAt(1);
	if(!songrun){
		var z=songs[x][0];
```

```
            document.getElementById("sname").innerHTML=sname[x];
            document.getElementById("sel").src= z;
            document.getElementById("main_slider").load();
            document.getElementById("main_slider").play();
            document.getElementById("emoji").style.backgroundImage="url('"+songs[x][3]+"')";
            songrun=true;
            return;
      }
      if(bool[x]==true)
            return;

      bool[x]=true;
      var l=document.createElement("label");
      l.id="e"+eqc;
      l.name=x;
      l.innerHTML=sname[x]+"<br>";
      //var text=document.createTextNode(sname[x]+"<br>");
      //l.appendChild(text);
      document.getElementById("queue").appendChild(l);
      eqc=eqc+1;
}

function nextsong(){
      if(sqc==eqc){
                        alert("Queue is empty.");
                        return;
            }
            var elem=document.getElementById("e"+sqc);
                  var xa=elem.name;
                  var pa=songs[xa][0];
                  bool[xa]=false;
                  document.getElementById("sname").innerHTML=sname[xa];
                  document.getElementById("sel").src= pa;
                  document.getElementById("main_slider").load();
                  document.getElementById("main_slider").play();
                  document.getElementById("emoji").style.backgroundImage="url('"+songs[xa][3]+"')";

                  songrun=true;
                  document.getElementById("queue").removeChild(elem);
```

```
                  sqc=sqc+1;

}

function next_in_Q(){
                  songrun=false;
                  if(sqc==eqc){
                        alert("Queue is empty.");
                        return;
                  }
                  var elem=document.getElementById("e"+sqc);
                  var xa=elem.name;
                  var pa=songs[xa][0];
                  document.getElementById("sname").innerHTML=sname[xa];
                  document.getElementById("sel").src= pa;
                  document.getElementById("main_slider").load();
                  document.getElementById("main_slider").play();
                  document.getElementById("emoji").style.backgroundImage="url('"+songs[xa][3]+"')";
                  songrun=true;
                  document.getElementById("queue").removeChild(elem);
                  sqc=sqc+1;
                  }

function rand_play(){
      var index=Math.random()*path.length;
      index=parseInt(index);
      var pa=songs[index][0];
      document.getElementById("sname").innerHTML=sname[index];
      document.getElementById("sel").src= pa;
      document.getElementById("main_slider").load();
      document.getElementById("main_slider").play();
      document.getElementById("emoji").style.backgroundImage="url('"+songs[index][3]+"')";
      songrun=true;

}
function moody(val){
      var index=Math.random()*mood[val].length;
      index=parseInt(index);
      var pa=songs[mood[val][index]-1][0];
```

```
function moody(val){
      var index=Math.random()*mood[val].length;
      index=parseInt(index);
      var pa=songs[mood[val][index]-1][0];
      document.getElementById("sname").innerHTML=sname[mood[val][index]-1];
      document.getElementById("sel").src= pa;
      document.getElementById("main_slider").load();
      document.getElementById("main_slider").play();
      document.getElementById("emoji").style.backgroundImage="url('"+songs[mood[val][index]-1][3]+"')";
      songrun=true;
}

async function getTime() {
               let value = await eel.getEmotion()();
               if(value=="angry")
                 moody(0);
               else if(value=="happy")
                 moody(1);
               else if(value=="sad")
                 moody(2);
               else
                 moody(3);
           }
```

7.2 Alignment:

```
#first{
      width: 97.1%;
      height: 50px;
      background-color: rgba(44, 62, 80,.8);
      position: fixed;
      padding: 20px;
      top: 0;
      margin-left: 0;
      }
#queue{
      color: white;
      font-size: 20px;
      font-family: "Segoe Script";
      margin-right: 0px;
      margin-top: 27px;
      margin-left: 1100px;
      width: 230px;
      height: 600px;
      background-color: rgba(1,1,1,0.9);
      border-bottom-right-radius: 10px;
      border-top-left-radius: 10px;
      border-bottom-left-radius: 10px;
      border-top-right-radius: 10px;
      position: absolute;
      z-index: -1;
      overflow: hidden;
}
```

```
#next{
            border-color: rgba(1,1,1,0.5);
            background:transparent url("next.png");
            /*mix-blend-mode: multiply;*/
            background-size: cover;
            border-bottom-left-radius: 50%;
            border-top-left-radius: 50%;
            border-bottom-right-radius: 50%;
            border-top-right-radius: 50%;
            height: 40px;
            width: 40px;
            margin-left: 20px;
            margin-top: 0px;
            z-index: 2;
      }
      #next:focus{
            outline: none;
      }
      #next:hover{
            box-shadow: 0px 0px 5px 5px white;
            border-color: black;
            background-color: rgba(1,1,1);
            border-bottom-left-radius: 50%;
            border-top-left-radius: 50%;
            border-bottom-right-radius: 50%;
            border-top-right-radius: 50%;
            z-index: 2;

      }
```

```
#third{
                    width: 100%;
                    height: 80px;
                    padding: 20px;
                    padding-bottom: 0px;
                    padding-top: 10px;
                    float: left;
                    position: fixed;
                    bottom: 0;
                    left:0;
                    background-color: rgba(1,1,1,0.8);
                    color:rgb(250,250,250);
                    font-family: "Segoe Script";
              }
               #mod{
                    display: inline;
                    position: absolute;
                    right: 50px;
              }
audio{
              position: fixed;
              margin-top: 28px;
              right: 20px;
              width: 90%;
              }
label{

       font-family: "Segoe Script";
       width: 500px;
       height: 10px;
}
```

```
#emoji{
      width: 75px;
      height: 75px;
      display: inline-grid;
      border-color: rgba(1,1,1,0.5);
      background:transparent url("next.png");
      /*mix-blend-mode: multiply;*/
      background-size: cover;
      border-bottom-left-radius: 50%;
      border-top-left-radius: 50%;
      border-bottom-right-radius: 50%;
      border-top-right-radius: 50%;
}
#xyz{
                    display: inline;
                    position: absolute;

              }
```

Modules Implemented:

Expression Detection and Recognition:

This part contains 5 modules namely,

- Image Capture
- Emotion Detection
- Training

All these work together to detect the mood of the user and display a corresponding emoji on the music player and play songs according to the emotion of the user.

- Recommendation Module

The system will detect human emotions and classify them using SVM.

OUTPUT FOR:

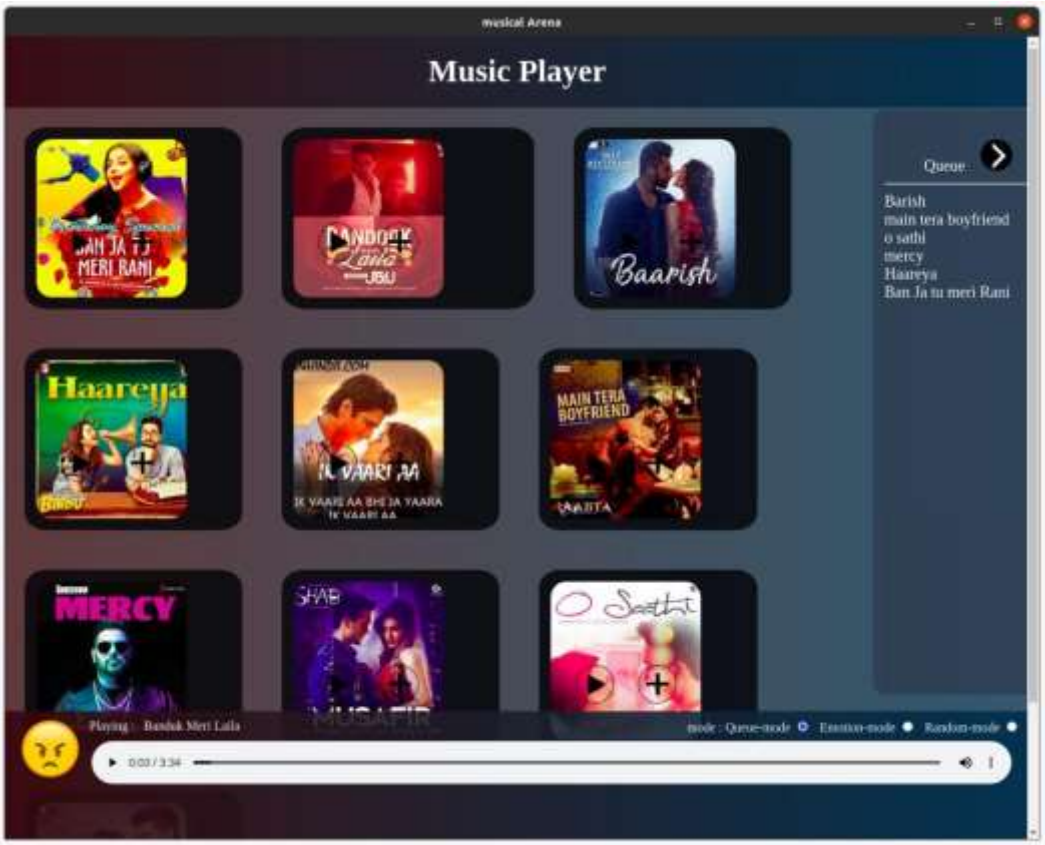
- Neutral mood

- Sad mood

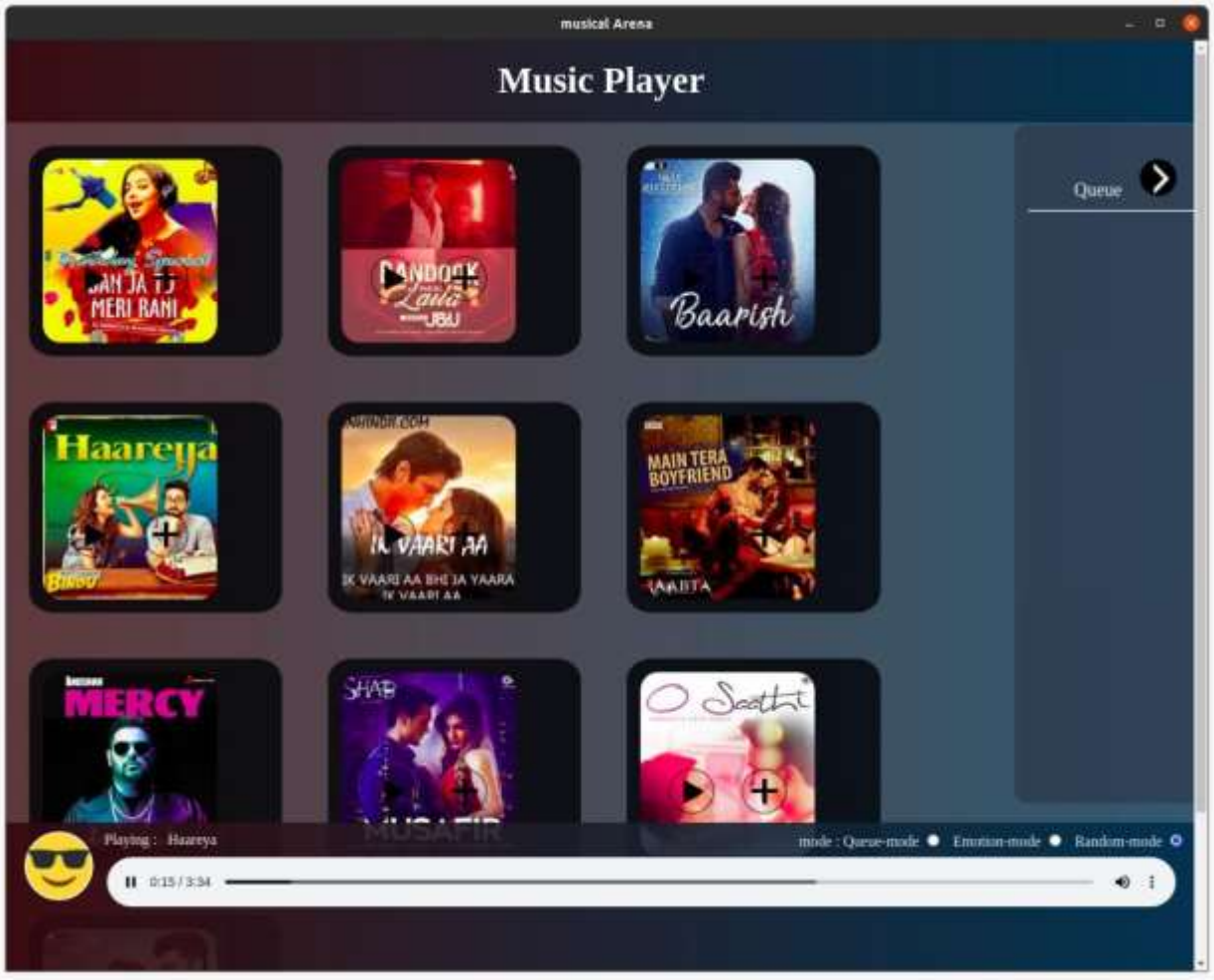
- Angry mood

- Happy mood

- Queue mode:



- Random mode:


musical Arena
Music Player
Queue
Baarish
Haareya
MAIN TERA BOYFRIEND
MERCY
Playing : Haareya
mode : Queue-mode
Emotion-mode
Random-mode
0:15 / 3:54

8. Testing

USABILITY TESTING

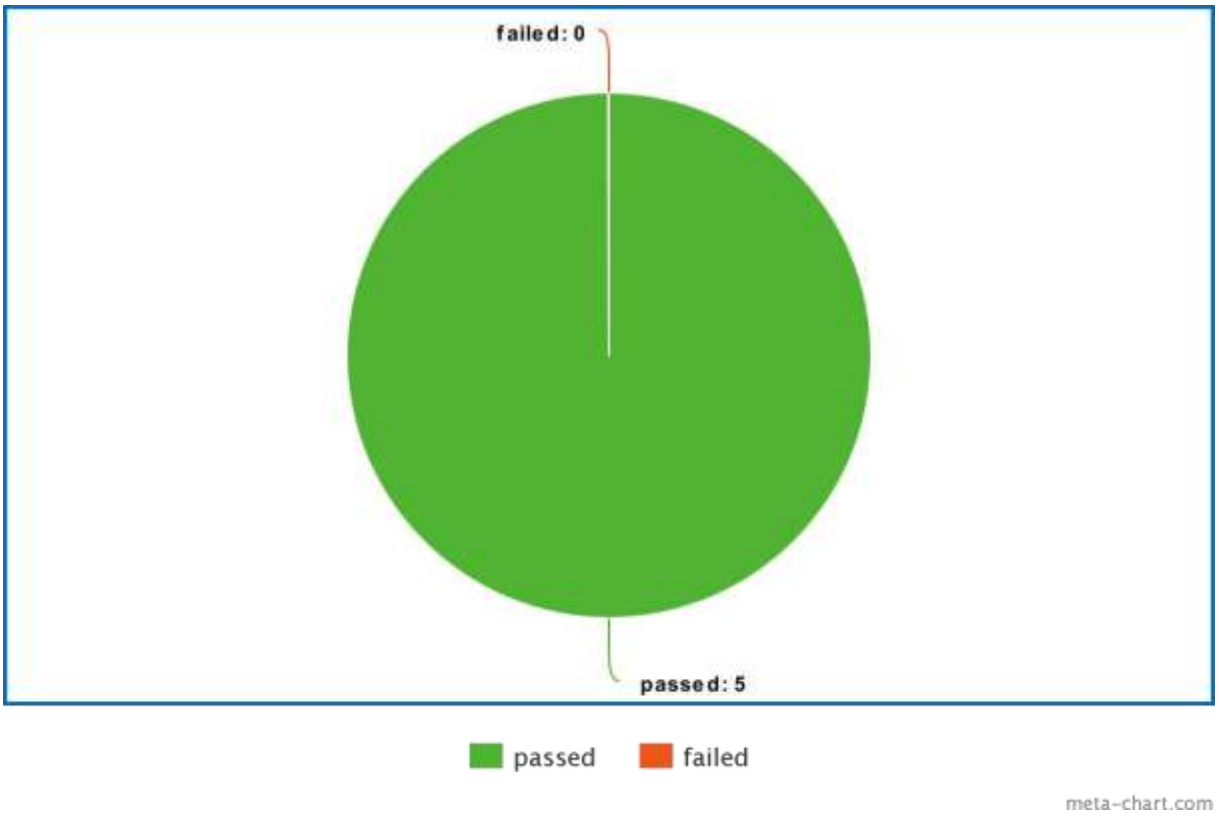
S.No.	Tests
1	Verify if a user can change the mode of playing
2	Verify if the random mode is working
3	Verify if the favorite mode is working
4	Verify if the facial recognition mode is working
5	Verify if a user can logout

Tests	Passed or failed	Time Taken
Verify if a user can change the mode of playing	PASSED	2mins
Verify if the random mode is working	PASSED	1min
Verify if the favorite mode is working	PASSED	1min
Verify if the facial recognition mode is working	PASSED	1 min
Verify if a user can logout	PASSED	1 min

Summary

- No of testcases planned vs executed: 5V5
- No of testcases passed vs failed: 5v0

Testcases planned	Testcases executed	Testcases passed	Testcases failed
5	5	5	0



UNIT TESTING

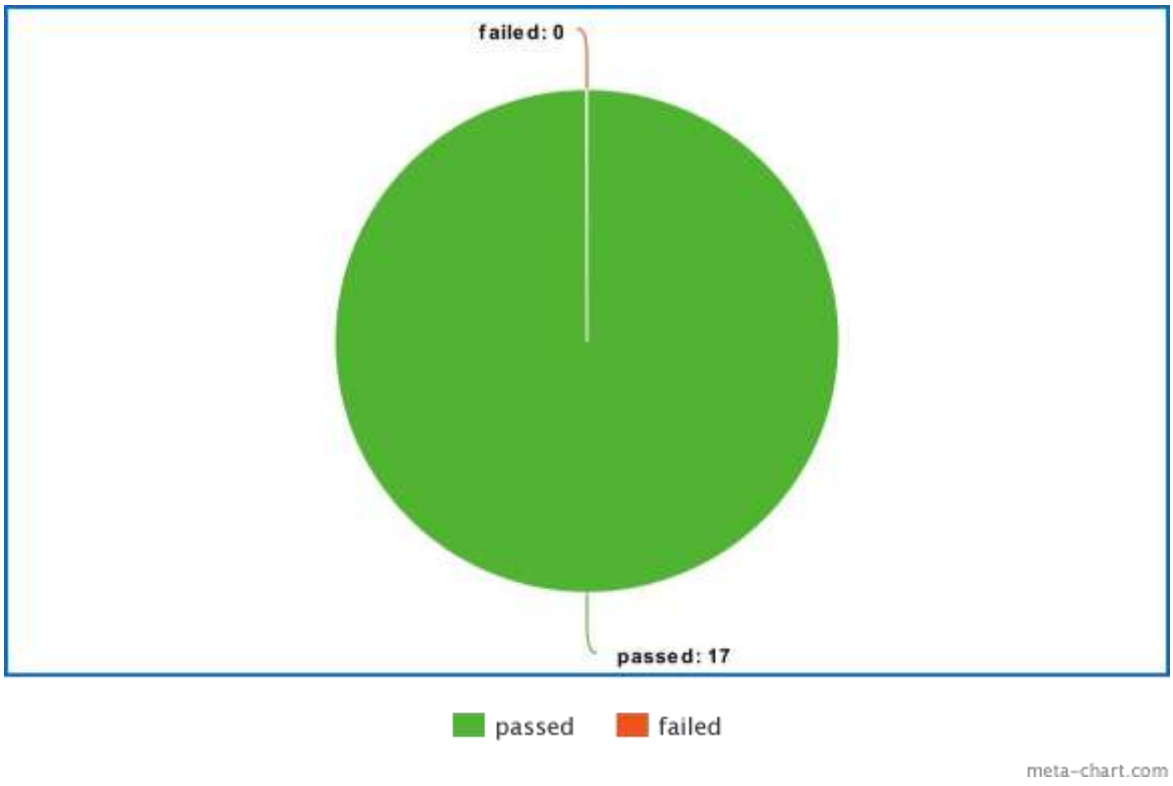
Test Case No.	TestCase	Expected Result	Actual Result	Pass/Fail
1	Change mode to random mode	Move to the random mode	Move to the random mode	Pass
2	Change song to next Song	Play next song	Play next song	Pass
3	Change song to previous song	Play previous song	Play previous song	Pass
4	Change to the favorite mode	Move to the favorite mode	Move to the favorite mode	Pass
5	Change song to next Song	Play next song	Play next song	Pass
6	Change song to next song	Play next song	Play next song	Pass
7	Move song using the Seek option	Can forward song Using seek	Can forward song using seek	Pass
8	Change to the emotion mode	Move to the emotion mode	Move to the emotion mode	Pass
9	Ask permission to access camera	Pop up option to access camera	Pop up option to access camera	Pass
10	Recognize the facial Expression of neutral mode	Detected the emotion of neutral mood	Detected the Emotion of neutral mood	Pass
11	Recognize the facial expression of sad mode	Detected the emotion of sad Mood	Detected the emotion of sad mood	Pass

12	Recognize the facial expression of angry mood	Detected the emotion of angry mood	Detected the emotion of angry mood	Pass
13	Recognize the facial Expression of happy mode	Detected the Emotion of happy mood	Detected the Emotion of happy mood	Pass
14	Change song to next Song	Play next song	Play next song	Pass
15	Changes on to next song	Play next song	Play next song	Pass
16	Move song using the seek option	Can forward song using seek	Can forward song using seek	Pass

Summary

- No of testcases planned vs executed: 17v17
- No of testcases passed vs failed: 17v0

Testcases planned	Testcases executed	Testcases passed	Testcases failed
17	17	17	0



ADVANTAGES

- Extremely quick computation of features
- Selection of features with efficiency
- Detector that is scale and location invariant
- We scale the features rather than the image (as with pyramid-filters).
- A generic detection technique like this can be trained to detect a variety of different things (e.g. cars).
- The user does not wish to choose songs by hand.
- There's no need for a playlist.
- The user does not want to categorise songs based on their emotional content.

DISADVANTAGES

- Only frontal photos of faces are most successful with the detector.
- Sensitive to changes in illumination.
- Due to overlapping sub-windows, we may get several detections of the same face.

9 Conclusion and Futurescope

Facial expression detection is a difficult subject in the field of image analysis and computer vision that has gotten a lot of interest in recent years due to its wide range of applications. We made a music player containing three modes Emotional, Random, Queue. The center of attraction “Emotion mode” which will play music according to the mood of the user. We made an user centric system and tried to make it easier for the user to operate the system. We developed an User Interface using front end so that this can be operated in any system. The field of expression recognition research can be further explored and improved. Despite the small dataset size, the training is done with a fisher face classifier, which achieves a 91 percent accuracy. We'll widen the emotions in future study by incorporating more datasets. These emotions can be recognised more accurately when a dataset with a higher number of photos is used. This would also help us expand our song catalogue and improve song matching based on the user's preferences. This project can be further enhanced by bringing in more emotions like disgust, fear, dissatisfaction ,confused etc. which can be done by increasing the dataset. Authorization of every registered human can be made stronger by training over larger dataset so that there is no chance of wrong analysis. With every emotion analysed in various situations for a particular person, a hypothesis of his mental health can be produced to further use this in medical diagnosis and psychological experiments. It can also be used to be made specialized or each and every user based on their likes and dislikes of the songs.

References

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4.2019 Facial Expression Based Music Playerhttps://ieeexplore.ieee.org/document/7732105
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6. Arora, A. Kaul and V. Mittal, "Mood Based Music Player," 2019 International Conference on Signal Processing and Communication(ICSC),NOIDA,India,2019,pp.333-337,doi:10.1109/ICSC45622.2019.8938384.
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9.2017AnEfficientReal-TimeEmotionDetectionUsingCameraandFacialLandmarM