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EMOTION BASED MUSIC PLAYER (EMOTIFY)

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***Abstract*—Music has become an integral part of everybody's life. We currently have a variety of music applications that can be connected to the internet and view suggested or related songs based on the playlist of the user, enabling users to exchange playlists and categorize songs into different genres.This paper proposes a system which would help the user identify their emotions through facial analysis and be able to listen accordingly to the best suited songs. This speeds up the process of finding the best suited songs by eliminating the manual work. Our proposed system uses Microsoft emotion recognition for facial analysis, a system that has already analyzed emotions and has the MicrosoftFace API which has analyzed over 1 million faces and presents an average true positive value up to 60%. This API helps capture and evaluate emotion from an image in the application. Within this system, computer vision components are usedto assess the emotion of the user by facial expressions. The camera of the device captures the user's image. The system can assess the user's emotions and map to predefined playlists based on the captured emotions.**

Keywords*— *Microsoft emotion recognition API, flutter, Firebase

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I.INTRODUCTION

Music is a major form of entertainment. Through the advent of technology, much focus has been given to the optimization of manual labor. There are still many traditional music players who need songs to be selected and arranged manually. User, the playlist needs to be generated and modified for every mood which takes time. Some of the music players have advanced features, such as lyrics and assisting the user by suggesting similar tracks. While some of these features are fun for users, when it comes to music players there is scope for improvement in the field of automation. Automatic selection of songs and arrangement of these gives a much better experience to the user.This can be achieved by responding via the system to the emotion of the user, saving time that could be spent inserting information manually.

In today's world, with increasing developments in multimedia and technology, various music players have been built features such as fast forward, reverse, variable playback speed (search & time compression), local playback, streaming playback with multicast streams. Although these features meet the basic needs of the user, the user has to manually search through the music playlist and select songs based on his current mood and behavior.Now in the contemporary world, where clicking a photograph and being attentive to music on the go is simply an aspect of daily life of everybody, always appreciating any changes in the functioning of these technologies that successively make the user experience better. With technological upgrades the level of software complexity has also increased. Facial-based Music Player is an immersive, sophisticated and creative smartphone (Android) based technology that can be used in a distinct way as a music player. The program operates very differently from the usual applications, as it scans and classifies the audio files on the device. This proposed program supported the countenance extraction saves time and energy leading to accurate songs.

This eliminates the risk from others that the user will have to play by prying the list of songs inside the playlist manually. Facial expression is perhaps the most ancient and natural way to express thoughts, emotions and mood and its algorithm takes less time and energy in the computation.

II.RELATED WORKS

In the year 2018, Ramya Ramanathan, Radha Kumaran, R.Ram Rohan, Rajat Gupta, Vishalakshi Prabhu presented a paper[1] on an intelligent music player based on emotional recognition where music clustering, music emotion recognition, music suggestion Audio function extraction and plotting was used on Thaye's graph. It has a downside of the audio features that will be performed on the general emotions to ensure a better and more precise calculation of the values of anticipation and valence.

In 2018, Sneha Lukose, Savitha S Upadhya and their team published a paper[2] on Music player focused on emotional recognition of voice signals that used cepstral coefficients for ser systemMel frequency. The lag found in this method was that to detect the emotions, SVM provides better accuracy.

In 2018, a paper[3]on EMOSIC was presented by Karthik Subramanian Nathan, Manasi Arun, Megala S Kannan, using Valence arousal plans Regression. The downside was that it was not practical to store a variety of music in

an device when we could actually use cloud storage for extended memory retirement.

Shlok Gilda, Yusain Zafar, Chintan soni presented a paper in 2018[4] Smart music player combining facial emotion recognition and music mood suggestion that uses action units for recognition. CNN for understanding feelings. Vectors to discover pattern. This system lacks only three emotions (happy, relaxed and angry) due to Less Robust, separate language not sponsored.

Vatsala Mittal, Anuja Arora and Aastha kaul presented a paper[5] on Mood Based Game in 2019 which is done using feature selection, classification and detection of facial mood.The downside of this method is that the extracted audio features could be sufficient to predict moods but the models could be enhanced by applying extraction features to each single file.

The key distinction between our proposed paper and current technologies is the use of the high-performance cross-platform called flutter, which can also be run on the web without changing the source code.

III. PROPOSED SYSTEM

The framework proposed uses Microsoft's azure face API to detect the emotion of the image being fed. The architecture of our frame work is shown in Figure 1.The application is designed using the most widely used architectural model, the Model-View-Controller model (commonly known as MVC). Here the application is divided into three key components that are interconnected: the model, the view and the controller.

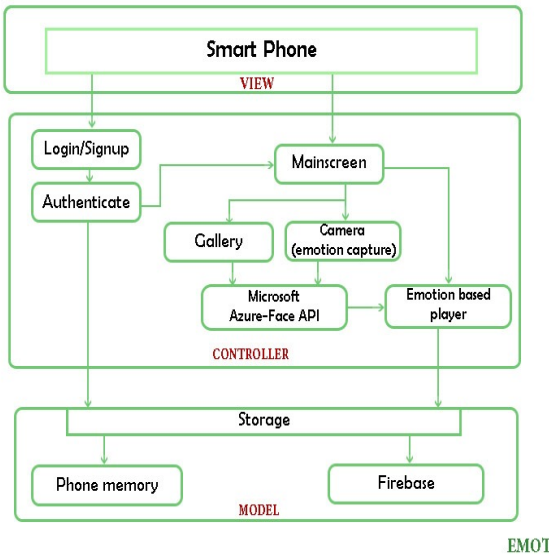

Figure 1. The architecture of the proposed emotion-based music player.

The top layer is where the end-user interacts with the application by clicking buttons, typing information, accessing camera, playing songs etc. This layer is responsible for presenting all data to the user based on application requirement. This layer also acts as a bridge between the user and the application.

The application's main feature resides in the Controller layer. In this layer the user's action is processed. All calls to the feature are made in the controller layer.In this view, actions such as logging into the application, authenticating the user whether the information entered is right or not, the options allowing the user to manually select the mood combined with evaluating the user's mood by clicking on an image. In addition, the analysis of facial attributes provided by the Microsoft Face API is performed in MVC architectural pattern's controller layer.

This layer is responsible for storing user data. The login credentials as well as authentication of the user, to the songs that the user uploads on to the application are stored in the firebase which is a part of the model layer. To some extent phone memory is used where the captured images of the user are stored temporarily and are later sent to the Microsoft Face API in the form of URL or binary data which helps us determine the mood of the user.

A project must be created on the firebase with the required specifications by defining it. The firebase generates a JSON file. We make use of the firebase plugins to register the user with a user name and a password for further authentication on the server. The email ID and password must follow the correct format to be registered else an error message is displayed out.

Login can be done only when the user ID is registered. The application provides two options for the type of songs to be played, one either by clicking on the icon present displaying the eight different emotions or by clicking on the camera icon. The dialogue box provides the user to capture their image or to select an image from the gallery. The image is stored in the local cache memory and an API call is made to the server. The output JSON file contains the detected emotion as one of its features. The resultant is a combination of a list of emotion type and its associated values. The emotion is selected based on the highest valued of the emotion type. The mapping of strings takes place and the corresponding file is selected and the songs under it are played automatically.

A. Firebase

Firebase can be aforum for developing mobile and web applications. Firebase offers a database in real time, which also has sync functionality. Our application's user interface was built using firebase kit. A JSON file is generated by firebase which connects the storage of our project to firebase. Using firebase plug-ins, necessary calls to the server were made so as to create/authenticate the user. All the songs on the playlist of the user are uploaded and stored in the firebase. And the songs are played by accessing their URL.

B. Microsoft Face API

Microsoft Face API is a technology provided by Microsoft that uses face algorithms based on cloud to detect and recognize human faces in photographs. It helps our software analyze user's facial expressions and determine the mood. The Face API can perform emotion

detection to detect emotions such as happiness, sadness, anger, disgust, fear, surprise, neutral and contempt. Our application performs emotion recognition via the REST API. Emotion recognition is performed by making a POST request to the detect API. The user captures the image which is placed in the body of the POST request as a URL or binary data. The API responds in a JSON format.

C. Flutter

Flutter is an open source UI software development kit which is used to build android, Mac, iOS, Windows, Linux, etc. applications. Flutter uses the programming language DART. The application is constructed using a widget tree. On the screen, we have control over every pixel which gives flexibility.

IV. SYSTEM REQUIREMENTS

Software Requirement	**Hardware requirements**
Chrome 51 or higher/ Firefox 47 or higher/ Opera 37 / Edge 10586. Firebase. Min 5'5-inch display MicrosoftFace API. Android OS.	Processor: 1.7 GHz RAM: 2 GB 20mb disk space

V. RESULTS

Microsoft emotion recognition API that we have used provides an accuracy of 60% which has been evaluated for over 1 million faces.

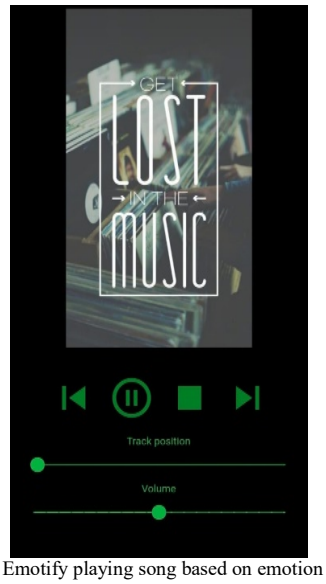

Figure 2. Emotify playing song based on emotion detected.

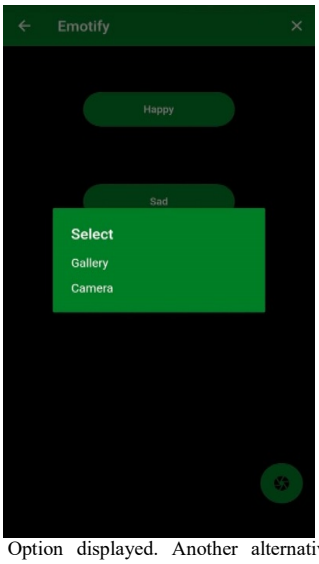

Figure 3. Option displayed. Another alternative way of deciding the emotion is either by selecting an image from the gallery or by capturing a picture of the user from the device. The picture selected will be sent to the Microsoft Face API in the form of a URL or binary data, the image is analyzed and the emotion is detected. And, songs are played accordingly.

The proposed system has proven to be successful in providing the correct emotion. After analyzing the picture, plays the accurate song according to the emotion.

VI. CONCLUSION AND FUTURE SCOPE

In our implementation, flutter is the SDK used which isadvantageous for running the single application on different platforms. It also provides same business logic in all platforms; it reduces the code development time and has its own high-performance cross platform rendering machine.

The limitations of the proposed paper include latency in the initial phase of the application, functionality is limited and also the facial expression can manipulate. The songs do not run in a loop. We look forward to overcome these limitations in the future.

In the future we can work efficiently on these limitations and enhance the user experience which on the whole could improve the system in various aspects.

By creating our own emotion recognition model, we can increase the accuracy of the emotion to be detected.

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