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Advanced Music Player With Integrated Face Recognition Mechanism

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Abstract- **Music is naturally interlaced with our day to day life. People tend to use music in the morning to smoothly complete their chores, to let loose after work and to make it through a training time. Students use music while learning and surgeons with music in the background perform their most intensive procedures. Basically, people use music to improve their mood. Positive condition of mind increases power of invention, improves decision making process, and strengthens social relationships. Moreover, positive state of mind lightens us from the stress, which can otherwise have a damaging effect on our health and well-being. The idea is to automate the interactions between the users and music player, so as to provide a user-friendly environment. This project introduces a music player which learns all the preferences, emotions and activities of a user and customizes its song selection accordingly. The various facial expressions of users can be recorded by the gadget to determine the emotion of the user at that instance so as to predict the genre of the music.**

Index Terms- **Snapdragon Processor, Face Recognition, Music Player, mood, AMPs.**

I. INTRODUCTION

The last 2 decades have changed our music listening experience. Music in today's world can be accessed from anywhere and at any time. We listen to music while walking on the road, while cleaning the house, while reading a book. Moreover, we listen to different kinds of music on different occasions. We need an energized music running in the background while cleaning whereas we need a clam environment while reading a book.

Music is an amazing mood enhancer, both in laboratory settings and in the real world. Moreover, it is believed that music's most important function is to enhance mood. So, what if your music player knew what effects a song has on your mood? Wouldn't that be amazing?

Players like this would create playlists on its own which can energize you, help you think better, and also help

relax. This could also select songs according to the situation you are in with a little more information given to it.

An approach to expand the music selection processes is by taking the advantage of the emotional intelligence. A music player with emotional intelligence could automatically generate playlists that can empower you, unwind you, or make you more satisfied. This is how such a music player can focus on affective qualities specific activities require.

In addition, this innovation can tune into your inclination, fitting the chose music to your current full of feeling state. Beside hedonic intentions, the capacity to affect temperament is likewise pertinent to one's intellectual execution, and wellbeing and prosperity.

Positive condition of mind increases power of invention, improves decision making process, and strengthens social relationships. Moreover, positive state of mind lightens us from the stress, which can otherwise have a damaging effect on our health and well-being.

The idea is to automate the interactions between the users and music player, so as to provide a user-friendly environment. This project introduces a music player which learns all the preferences, emotions and activities of a user and customizes its song selection accordingly. The various facial expressions of users can be recorded by the gadget to determine the emotion of the user at that instance so as to predict the genre of the music.

This music player learns from its user. Its gets trained for what music is preferred under what condition. After the initial training period, the music can use the internal algorithms to select the most appropriate songs that would best fit for user's emotion and condition.

The increasing knowledge of devices are able to give authentic data about user activity and emotions which has helped in development of human-aware mobile systems.

II. LITERATURE REVIEW

Mood is an emotional state and has been broadly considered in psychology. Mood is related but different from another important affective state, emotion, in several important cases. Mood is felt for less intensively but lasts longer than emotion for e.g. not for minutes and seconds but it persists for hours and days. Mood is a response to activities over a period of time whereas emotion is

response to a specific activity. Emotion is external that is visible to others while the mood is mood is internal. Because the mood has a long lasting nature it reflects the underlying feelings of the people [5].

Psychology and neural studies indicate that dynamic personal characters and fixed facial features can used to recognize a face. In spite of the usefulness of the dynamic facial characters systems are unable to exploit and integrate it. Systems work only on the static character that is using the still images to for facial recognition. Only in the recent time the researchers came across the problem of face recognition from video [6].

III. EXISTING SYSTEM

There are many approaches for that have been proposed and developed to distinguish user's emotional state. All the proposed approaches have focused only on the basic emotions. Facial features have been categorized into two main divisions, that are Appearance-Based features extraction and Geometric-based features extraction by Zheng et. al [1,3]. A precise and productive statistical based for analyzing the features of face that are extracted was proposed by Renuka R. Londhe et al [2,3].

One of the approaches is, Affective DJ by Healey et al. (1998) which saves the skin conductance changes and generates a song to the database. It then selects music so as to direct you to a relaxed state. "It is actually very difficult to test such a system and time consuming too as there are number of variables to be taken care of and the system should actually have lots of music and to be worn for huge time before it can give you the planned advantages" [4].

Existing work in affect for recognition primarily focuses on the emotions and does as such generally by utilizing the visual and acoustic signs found in the speech, action and face of the users. While the creators at times use mood and emotion reciprocally, they quite often measure transient affective states, not moods for e.g. mood meters can detect a smile, but this momentarily smile tells nothing about the long term mood, unless there are some dynamic characters coming into consideration.

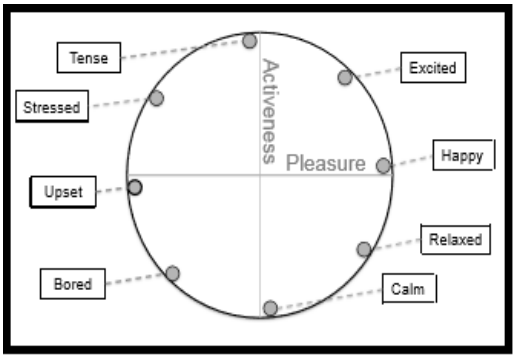

Figure 3.1 Circumplex of mood model

In the last decade there were many AMPs that were proposed. The Body Rest system by Liljedahl et al. (2005) it is a bio-feedback that works by adjusting the tempo of the music to fit ones heat rate. Utilizing this, users can pick up understanding into their own particular feeling state. This is biofeedback system in which the tempo of the music is changed instead of the adapting the selection of music [4].

Mostly all the methods for recognizing a face are based on still images or videos. Picture based procedures are fundamentally inspired by the shape, size and position of components, for example, eyes, nose and mouth. But the face of an individual is unique in other aspects as well, such as in the way it moves during facial expressions. Video-based routines use both the time-bound and spatial data for face recognition. But there is a problem of low video quality and video low resolution. On the other hand still images are high resolution images but have only the spatial data [7].

Previously, Bayesian network was also used for face recognition. Heusch et al. in the Bayesian clubbed the intensity and the face colour data for face recognition. Here hidden and observation nodes are used. Observation nodes are used to represent different parts of face and hidden nodes describes the type of observation. An embedded Bayesian network was proposed for efficient face recognition. Now there is a growing interest in market to study about the temporal dynamics in video sequences to improve the recognition performance beyond the image-based recognition.

Some of the drawbacks of the existing system are as follows:

1. Using the existing systems it is very difficult for extracting facial features in real time in terms of time and memory requirements.
2. The existing systems has lesser accuracy in generation of a playlist based on the current emotional state and behavior of a user.
3. Some existing systems use human speech and additional hardware as well for generation of an automated playlist, thereby increasing the total cost incurred [3].

IV. OBJECTIVE AND SCOPE

- To design a music player, that recognizes the user's emotion by face recognition and plays songs accordingly.
- For instance, when the user is happy, he will smile, and the music player will play happy songs by recognizing the user's emotion.
- Also, the goal is to design a much more interactive, easy-to-use music player.

V. METHODOLOGY

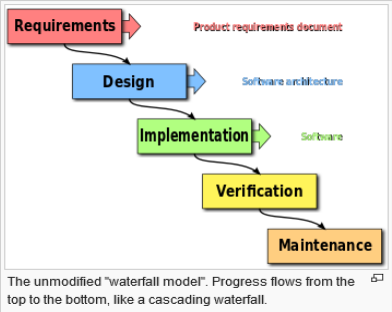

Figure5.1 Methodology

Waterfall Model is a sequential design process used in software development process in which process is seen as flowing steadily downward(like waterfall).

Through the conception, initiation, analysis, design, construction, testing, production/implementation and maintenance.

VI. OUR IMPLEMENTATION

"Advanced Music Player with Integrated Face Recognition Mechanism", is an interactive music player application, which runs on users mobile phone needs an Android OS. Face recognition and processing needs a strong and high quality processor.

Most of the traditional processors do not match the requirement. Snapdragon is a processor which is a System on Chip solution for the new Mobile Age. Snapdragon incorporates the latest in mobile architecture design and technology to address the demands for intelligent connectivity, high performance and energy efficiency. Snapdragon processor is an ultimate processor than can recognize and process a facial expression with ease and high efficiency. There are two phases after the installation of the music player application.

The first phase is the TRAINING phase. In training phase, the user imitates some expressions the application asks him to, and each of these expressions will be mapped to a specific emotion. According to the emotions, playlists is created, using their genres. Some basic emotions are: HAPPY, SAD, ANGER, and EXCITEMENT.

In our application the face recognition mechanism is dynamic i.e. it does not need to store the picture of the user in advance to select his/her emotion.

After the training phase is over, the user can start listing to the music. This can be done by selecting the camera button in the app. The camera then senses the emotion of the user. Then the app plays a playlist accordingly.

Screenshots:

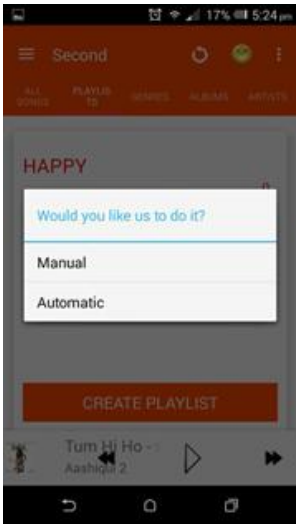

Fig 6.1 Select How to create playlist

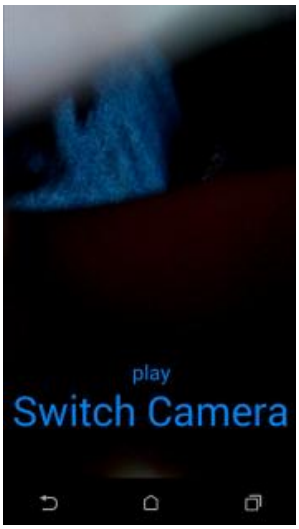

Fig. 6.2 if automatic selected

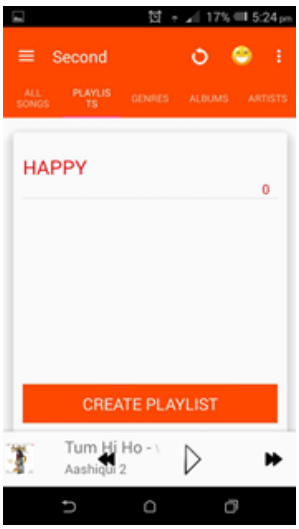

Fig. 6.3 Playlist created based on emotion

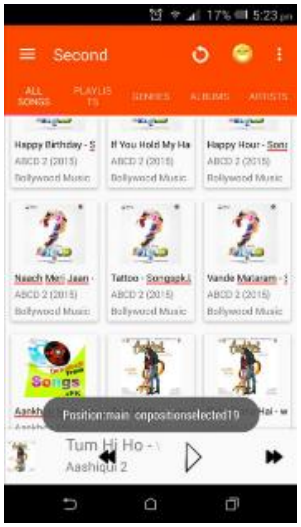

Fig. 6.4 Click on Smiley to listen to music

Fig. 6.5 Music Plays and Emotion can be corrected

VII. CONCLUSION

Experimental results have shown that music can be used to effect moods of people. It is also a known fact that face expressions are a good way to perceive a person's mood. By combining these 2 facts the application aims at providing an effective and easy way to organize playlists based on moods. It is an attempt to provide an interactive using experience, producing a technology that may change the way people use and experience music on their mobile devices.

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