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A Mood Based Music Player

Vaasu Gupta[1], Siddharth Kumar[2], M. Viswanath[3]
[1,2,3]*Student, Department of Computer Science and Engineering, Vellore Institute of Technology, Vellore, India*

***Abstract*: Expanding and keeping up human efficiency of various errands in unpleasant condition is a test. Music is a fundamental mind-set controller and aides in improving the temperament and condition of the individual. Nonstop music play requires making and overseeing customized melody playlist, which is a tedious errand. It would be useful if the music player itself chooses a melody as indicated by the present mind-set of the client. Music has the potential to change our state of mind and improve the mood. In today's hectic and stressful environment, maintaining human productivity can be challenge. Therefore, music can be a great means of improving the overall mood of the person but sometimes it becomes tedious as well as frustrating task to find or create a playlist that suits the specific mood. Since the computerized music libraries is continually extending, therefore making it considerably additional tedious and hard to review a specific tune. Our topic is aimed to provide people with befitting music using facial recognition as well as data collected from already selected songs by the user, saving the time and thereby enhancing user experience. This project was therefore aimed to provide people with befitting music using facial recognition, saving the time which is required to go into the files and scroll at a never ending list of songs to choose from thereby enhancing user experience.**

***Keywords*: Mood, player, design, Image processing OpenCV, Facial detection.**

1. Introduction

As we all know that music has the potential to change are state of mind and everybody loves listening to music if it matches their current mood but it becomes really frustrating and even time consuming to select music of their choice from a never ending playlist. Our project is based on emotion detection of the user and then sorting the playlist according to the mood detected. There is ample research and work carried out in the field of emotion detection from faces. Music is often described as a "language of emotions" While processing music brain's language Centre, emotional Centre and memory Centre are connected thereby stimulating a thrill obtained by expected beats in a pattern to provide a synesthetic experience.

2. Issues in existing system

Existing frameworks are very mind boggling as far as time and memory prerequisites for separating facial includes progressively. In light of the current passionate state and conduct of a client, existing frameworks have a lesser precision in age of a playlist. Some current frameworks utilize the utilization of human discourse or now and then even extra equipment for age of a mechanized playlist, in this way expanding the all-out cost acquired.

3. Proposed solution

This project is based on the principle of detection of human emotions using image processing, and to play music which is appropriate for enhancing that emotional state. The state of mind and current emotional mood of human beings can be easily observed through their facial expressions. The overall system can be divided into various logical stages like capturing image, detection of face, detection of landmark points on the detected face, classifying those feature points with the help of SVM classifier, and then generating the playlist according to that recognized mood. This project was therefore aimed to provide people with befitting music using facial recognition, saving the time which is required to go into the files and scroll at a never ending list of songs to choose from thereby enhancing user experience.

Emotion recognition of user: Current mood state of the user is determined using Neural Networks (Convolutional Neural Nets or Recurrent NN). Input can be either graphic based (facial) or voice Chatbot oriented (audio). The determined mood is mapped across a provided mood table to generate a range of possible mood.

A. Sorting of Music based on emotions

The audio files are parsed to categorize them into different mood defined 'genres'. This is accomplished by using online open databases as well as custom audio files via feed forward convolutional neural networks. The current mood of the user is then checked against these databases of music. Most relevant music is thus played.

The proposed framework attempts to give an intelligent route to the client to do the undertaking of making a playlist. The working depends on various systems doing their capacity in a pre-characterized request to get the ideal yield. The working can be expressed as pursues:

- The proposed System works by first giving a straightforward interface which prompts the client to investigate the memory for sound documents when the application is opened.
- After the documents are identified, they are then examined for sound highlights and these highlights are extricated.
- The extricated include values are then exposed to

arrangement as indicated by the parameters gave.

- These parameters incorporate a restricted arrangement of classification types dependent on the sound element esteems to be prepared.
- After this, the melodies are partitioned into various playlists dependent on the component extraction process. Henceforth arrangements of comparable melodies or tunes having a place with comparative classes are produced.
- In the subsequent stage, the camera is opened with required authorization and an ongoing photo (picture) is caught which at that point gave to the framework.
- The framework filters the photo for nearness of a face in the information utilizing the face location procedure, and afterward arranges the information and creates a yield which is a feeling (state of mind) in view of the appearance extricated from the photo.
- After this, the articulation at that point goes about as an information and is utilized to choose a coordinating playlist from the at first produced playlists and the melodies from the playlists are played.

B. Memory

The camera captures the image and keeps the photo in RAM (STM) for processing until the correct expression is detected. Then based on the that expression a song is played.

4. Application of modules

A. Module 1

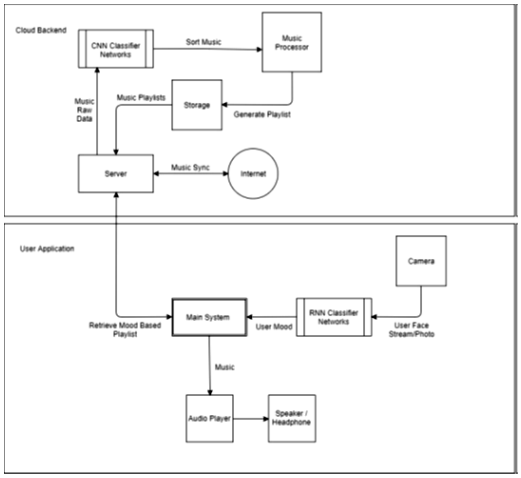


Fig. 1. Block diagram of the project

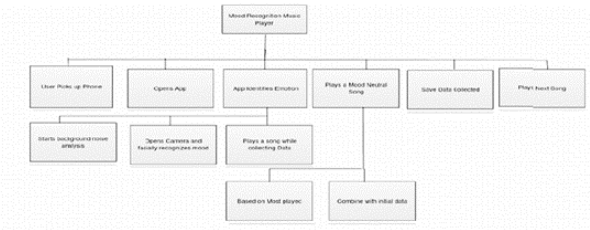


Fig. 2. HTA

B. Module 2

Task Analysis

- *Goal*

To create a playlist of songs according to the mood.

- *Task*

Detect the current mood of the user and then sort songs according to it.

- *The user*

A person who wants to listen to song of his/her choice and is familiar how to operate a smartphone.

- *The computer system*

A smartphone with a good front camera.

- Action – the user pick the phone and opens the app
  - Feedback – the application analyses the background noises
  - Feedback – the application opens the camera and detects the facial expression of the user upon which it will decide the mood of the user.
- Action – the user selects the song to be played.
  - Feedback – the app starts playing the song.
  - Feedback – the app creates playlist of song according to the detected mood, background noises and the songs preferences by the user.
- Action – the user selects another song from the generated playlist.
  - Feedback – the application plays the song.
  - Feedback – if the user has not selected any song from the playlist then it start playing the next song in the list automatically.
- Action – the user tries to close the application.
  - Feedback – the application displays the message "Would you like to close the application".
- Action – the user pressed the desired option.
  - Feedback – if the user chose to close the application then it saves the preferences of the user and close.

C. Module 3

Interaction Design involves four basic activities:

- *Identifying needs and setting up prerequisites*

Music is an indispensable mind-set controller and aides in improving the disposition and condition of the individual. Ceaseless music play requires making and overseeing customized tune playlist, which is a tedious assignment. Subsequently, we thought of an approach to give the advantages of music utilizing facial acknowledgment. Sparing the time, which is required to go into the records and look at an endless rundown of tunes to browse in this manner upgrading client experience.

- *Developing elective plans that meet those prerequisites*

Our project is based on emotion detection of the user and then sorting the playlist according to the mood detected. There is ample research and work carried out in the field of emotion detection from faces. Music is often described as a "language

of emotions" While processing music brain's language Centre, emotional Centre and memory Centre are connected thereby stimulating a thrill obtained by expected beats in a pattern to provide a synesthetic experience.

- *Building intelligent variants of the structures with the goal that they can be imparted and surveyed*

This project is based on the principle of detection of human emotions using image processing, and to play music, which is appropriate for enhancing that emotional state. The state of mind and current emotional mood of human beings can be easily observed through their facial expressions. The overall system can be divided into various logical stages like capturing image, detection of face, detection of landmark points on the Detected face, classifying those feature points with the help of SVM classifier, and then generating the playlist according to that recognized mood. This project was therefore aimed to provide people with befitting music using facial recognition, saving the time, which is required to go into the files and scroll at a never-ending list of songs to choose from thereby enhancing user experience.

- *Evaluating what is being worked all through the procedure*

The software we prepare thus is meant to be as intuitive to the end user as is made possible by the present commercially available cheap technology. The Human interaction interface using mood identification through facial expression recognition has opened a completely new range of possibilities. In future, we aim to fix possible bugs in our software, work on the UI, Think of better HCI, and create the infrastructure to support a vast user pool. Once the Initial App gets rid of all bugs, we may make it an Open Source project to facilitate high developmental pace.

D. *Module 4*

Shneiderman Principles Application

- *Strive for consistency* - The yield and the information screen for the interface will continue as before.
- Enable visit clients to utilize easy routes. For instance, the two Windows and Mac give clients can utilize a similar web cam to distinguish articulation
- *Offer educational input* - Produce yield dependent on the articulation.
- Design discourse to yield conclusion We don't keep your clients speculating. We reveal to them what their activity has driven them to.
- *Offer straightforward blunder taking care of* - When unavoidable mistakes happen, guarantee clients are furnished with basic, instinctive efficient guidelines to tackle the issue as fast and effortlessly as could be expected under the circumstances.
- *Reduce transient memory load* - Human consideration is restricted and we are just equipped for keeping up around five things in our momentary memory at once. In this way, interfaces ought to be as straightforward as conceivable with appropriate data chain of command, and picking acknowledgment over review.

Norman Principles Application

1. Use both information on the planet and information in the head - We consolidate the computerized world with the genuine through music.
2. Simplify the structure of errands - We improve all dispositions into basic chain of importance to rearrange the undertaking.
3. Make things noticeable Based on articulation the yield will be delivered.
4. Get the mappings right - We have mapped all the human articulations with their particular music type

E. *Design for blunder.*

Nielsen Principles Application

1. Visibility of framework status - The framework ought to consistently keep clients educated about what is happening, through suitable criticism inside sensible time.
2. Match among framework and this present reality - The framework ought to talk the clients' appearance with music, tunes and classifications. Well-known to the client, as opposed to framework situated terms.
3. User control and opportunity - Users frequently given clear controls and opportunity to pick the sort of music they like regardless of whether it doesn't coordinate with their looks.
4. Consistency and models - Users ought not need to ponder whether various words, circumstances, or activities mean something very similar.
5. Error avoidance - Even superior to anything great blunder messages is a cautious structure, which keeps an issue from happening in any case.
6. Recognition instead of review - The melodies could be founded on past understanding. The client ought not need to recall data starting with one piece of the exchange then onto the next.
7. Flexibility and effectiveness of utilization - Accelerators — inconspicuous by the beginner client — may frequently accelerate the cooperation for the master client with the end goal that the framework can take into account both unpracticed and experienced clients.
8. Aesthetic and moderate plan - Dialogs ought not contain data, which is unimportant or once in a while required.
9. Help clients perceive, analyze, and recuperate from mistakes - Error message ought to be shown when the framework isn't capable the perceive the articulation.
10. Help and documentation - Even however it is better if the framework can be utilized without documentation, it might be important to give assistance and documentation.

F. Module 5-6

Communication and Collaboration – Internal and External

1. Face-to-Face Communication

- It involves speech, hearing, body language and eye-gaze.
- A person has to be familiar with existing norms, to learn a new norm.
- The above factor comes into pitcher, when there is a communication from different people in the background.
- The factor of eye gaze is important as it is important to have eye contact during a conversation.
- Back channels help giving the user some clues or more information about the conversation.

G. Conversation

- Transcripts can be used as a heavily annotated conversation structure, but still lacks the back channel information.
- Another structure is of turn-taking, this can be interpreted as Adjacency pairs, e.g.: A-x, B-x, A-y, B-y
- Context varies according to the conversation.
- The focus of the context can also varies, this means that it is difficult to keep track of context using adjacency pairs.
- Break-downs during conversations is often a case and can be noticed by analyzing the transcripts.
- Reaching a common ground or grounding is very essential to understand the shared context.
- Speech act theory is based on the statements and its propositional meaning.
- A state diagram of the above can be constructed considering these acts as illocutionary points in the diagram. This is called Conversation for Action.

H. Text-Based Communication

4 types of communication

- Discrete e.g. email
- Linear e.g. single transcript
- Non-linear e.g. linked through hypertext fashion
- Spatial e.g. messages arranged in 2D surface
- Difference between this and face-to-face communication is that it has lack of back channels and states
- Turn-taking is the fundamental structure used here.

I. Group working

- The roles and relationship between the group individuals are different and may change during the conversation.
- Physical layout is important to consider here to maintain the factors in face-to-face communication.

The task utilizes OpenCV as the library behind face identification. OpenCV (Open Source Computer Vision) is a library of programming capacities mostly went for real-time PC vision.

J. Module 7

Ease of use Testing

Ease of use testing, a non-useful testing method that is a proportion of how effectively the framework can be utilized by end clients. It is hard to assess and gauge yet can be assessed dependent on the beneath parameters:

Level of Skill required to learn/utilize the product. It ought to keep up the parity for both beginner and master client.

- Time required to become acclimated to in utilizing the product.
- The proportion of increment in client profitability assuming any.
- Assessment of a client's frame of mind towards utilizing the product.

Contemplating above focuses, we applied Usability testing to our venture:

- Users can undoubtedly comprehend the interface as it basic and computerized.
- As this program is made to improve the client's mind-set clients have a decent encounter of utilizing this program.

Client Acceptance Testing

Client acknowledgment testing, a testing strategy where the client's/end clients associated with testing the item to approve the item against their necessities. It is performed at customer area at designer's site. For industry, for example, prescription or avionics industry, contract and administrative consistence testing and operational acknowledgment testing is additionally done as a major aspect of client acknowledgment testing.

UAT is setting subordinate and the UAT plans are readied dependent on the prerequisites and NOT required to execute a wide range of client acknowledgment tests and even planned and contributed by testing group.

Acknowledgment criteria are characterized based on the accompanying traits:

- Functional Correctness and Completeness
- Data Integrity
- Data Conversion
- Usability
- Performance
- Timeliness
- Confidentiality and Availability
- Install capacity and Upgradability
- Scalability

K. Documentation

The acknowledgment test exercises are completed in stages. Right off the bat, the fundamental tests are executed and in the event that the test outcomes are agreeable, at that point the execution of increasingly complex situations are completed.

The Acceptance test plan has the accompanying qualities:

- Introduction
- Acceptance Test Category
- Operation Environment
- Test case ID
- Test Title
- Test Objective
- Test Procedure
- Test Schedule
- Resources

The acknowledgment test exercises are intended to reach at one of the resolutions:

1. Accept the framework as conveyed
2. Accept the framework after the mentioned alterations have been made
3. Do not acknowledge the framework

The Acceptance Test Report has the accompanying traits:

- Report Identifier
- Summary of Results
- Variations
- Recommendations
- Summary of To-Do List
- Approval Decision

Interface Testing

Interface Testing is performed to assess whether frameworks or parts pass information and control effectively to each other. It is to check if every one of the cooperations between these modules are working appropriately and mistakes are dealt with appropriately.

Interface Testing – Checklist

- Verify that correspondence between the frameworks are done effectively
- Verify if all bolstered equipment/programming has been tried
- Verify if every single connected archive be upheld/opened on all stages
- Verify the security prerequisites or encryption while correspondence occurs between frameworks
- Check if a Solution can deal with arrange disappointments between Web website and application server

5. Implementation

There are two major components to the project:

1. The Face/Mood detection
2. The song player

- OpenCV handles the Face/Mood detection.

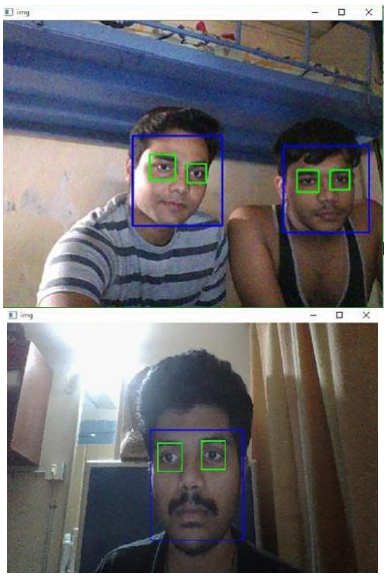
The app uses the front facing camera, to recognize the facial expression. For the sake of simplicity, we have kept only two basic emotions, happy and sad. If the user is smiling/laughing or if the use is frowning to determine the happy/sad emotion.

- The YouTube player API handles the song player.

Songs are played from YouTube according to the mood detected by the 1st component.

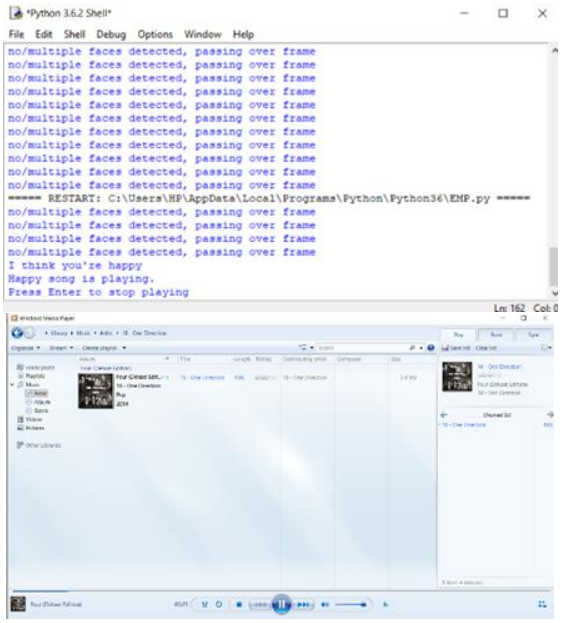
1) Facial expression detection

It will address three significant things: location of face from a picture, removing the facial element from the distinguished face and ordering the demeanor dependent on the component perceived. The principal arrange is of face recognition from a picture for which different procedures utilized are model based face following which incorporates constant face identification utilizing edge direction coordinating and Histograms of Oriented Gradients (HOG) descriptors. The following stage is to remove highlights from recognized face. Two significant approaches for highlight extraction, which use Gabor channels and Principle Component Analysis. These recognized highlights at that point went through SVM classifier to foresee the state of mind of the client. This anticipated state of mind will invigorate the production of playlist. During the preparation stage, a dataset of pictures will be made to prepare the SVM classifier while after execution of the framework a solitary caught picture can be given to prepared SVM record to anticipate the disposition.



2) Classification of music

In this stage, the predicted mood of the user is used to classify songs and to create a playlist for the particular mood. This classification of songs happens on the basis of genre of the songs. The genre of the various songs will be taken from online libraries and according to the mood detected the songs will be classified and a playlist will be created. The playlist will accordingly get modifies and updated with user's choice and its choice will be stored in database for future references. There are several online libraries that classifies the song according to its tempo and various other musical aspects.



6. Conclusion

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