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SMART MUSIC SYSTEM INTEGRATING FACIAL EMOTIONS

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Abstract:

Many of people have hobby to listen music. So music plays an important role in one's life. People react to music by their emotions. People tend to listen to music based on their mood and interests. This project focuses on creating an application to suggest songs for user based on their emotions by differentiating different kind of moods. This application is only based on moods and emotion depending on user's mood. For developing this application we are using Android Studio. This application is framed friendly to user. . In this system, computer vision components are used to determine the user's emotion through facial expressions and chatbot interactions. Once the emotion is recognized, the system suggests a song for that emotion, saving a lot of time for a user over selecting and playing songs manually

Everyone wants to listen music of their individual taste, mostly based on their mood. Average person spends more time to listen music. Music has high impact on person brain activity. User always face the task to manually browse the music and to create a playlist based on the current mood. This project i s v e r y e f f i c i e n t w h i c h generate a music playlist based on the current mood of user. However the proposed existing algorithms in use are comparably slow, less accurate and sometimes even require use of additional hardware like EEG or sensors. Facial expression is a easy way and most ancient way of expressing emotion, feelings and ongoing mood of the person. This model based on real time extraction of facial expression and identify the mood. In this project we are using Haar cascade classifier to extract the facial features based on the extracted features from haar cascade, we are using cohn kanade dataset to identify the emotion of user. If the user's detected emotion is neutral then the background will be detected and the music will play according to the background.

Chapter 1 Introduction:

Emotion detection/recognition can play an important role in many other potential applications such as music entertainment and human-computer interaction systems. Feng presented the first research in emotion detection is music. They implemented on the viewpoint of Computational Media Aesthetics (CMA) by analyzing two dimensions of tempo and articulation which are mapped into four categories of moods: happiness, anger, sadness and fear To provide an interface between the music system.

- To provide a very good entertainment for the users.
- To implement the ideas of machine learning.
- To provide a new age platform for music lovers.
- To bridge gap between growing technologies and music techniques.

The system will make use of different CNN Algorithm. Artificial Intelligence is a branch of computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy. Predictions like who would be the winner, What would be the song they should listen depending on their mood using CNN Algorithm. Proposed system will be developed using python programming language

The main concept of this project is to automatically play songs based on the emotions of the user. It aims to provide user-preferred music with emotion awareness.

- In existing system user want to manually select the songs, randomly played songs.User has to classify the songs into various emotions and then for playing the songs user has to manually select a particular emotion.
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Chapter 2 Literature Review:

2.1 Title: Emotion aware Smart Music Recommender using Two Level CNN.
Author: Krupa K S, Karthikey Rai, Ambara G.
Most of the time the digital music is sorted and put together based on attributes such as artist, genre, albums, language, popularity and so on. Many of the available online music streaming services recommend music based on user's preferences and his previous music listening history that employ content based and collaborative filtering recommendations. But these recommendations may not suite the current mood of the user. The manual classification of songs by learning user's preference of emotion is a time consuming task. So, recommendations can also be achieved using the physiological and emotional status of the user which are mainly captured from the user's facial expression, gestures, pulse rate, movement, speech/text interactions etc. Several work is carried to detect emotions using facial landmarks to extract the features . Nguyen et al. detected three kinds of emotions namely positive, negative and blank using 68 facial landmarks with an accuracy of 70.65. However, the expressions of human can be understood better by applying multimodal strategy instead of single approach.
2.2 . Title: Geometric Approach for Human Emotion Recognition using Facial Expression
Author: Jyoti Deshmukh, Sandeep Rangole
Paper contains emotion recognition system based on facial expression using Geometric approach. A human emotion recognition system consists of three steps: face detection, facial feature extraction and facial expression classification. In this paper, we used ananthropometric model to detect facial feature points. The detected feature points are group into two class static points and dynamic points. The distance between static points and dynamic points is used as a feature vector. Distance changes as we track these points in image sequence from neutral state to corresponding emotion. These distance vectors are used for input to classifier. SVM (Support Vector Machine) and RBFNN (Radial Basis Function Neural Network) used as classifier. Experimental results shows that the proposed approach is an effective method to recognize human emotions through facial expression with an emotion average recognition rate 91 for experiment purpose the Cohn Kanade databases is use
2.3 Title: Multi-Modal Emotion recognition on IEMOCAP Dataset using Deep Learning. Author: Tripathi S. ,Beigi H In this paper we combine these modes to make a stronger and more robust detector for emotions. We explore various deep learning based architectures to first get the best individual detection accuracy from each of the different modes. We then combine them in an ensemble based architecture to allow for training across the different modalities using the variations of the better individual models. Our ensemble consists of Long Short Term Memory networks, Convolution Neural Networks, fully connected Multi-Layer Perceptrons and we complement them using techniques such as Dropout, adaptive optimizers such as Adam, pretrained word-embedding models and Attention based RNN decoders. This allows us to individually target each modality and only perform feature fusion at the final stage. The advantages of our study are two-fold. First, since we target each modality individually, lack of availability of any modality does not cripple our algorithm and would not require retraining of other modalities but only the prefinal layer. This also allows our approach to be modular. Second, we use Motion-capture data instead of Video recording, hence we do not use 3D-Convolutions but 2D-Convolutions which are faster have less memory requirements. We also use advanced hyperparameter optimization tools to achieve the best possible model configuration depending on our resource constraints. Our code is open sourced for other researchers to repeat and enhance our study.
2.4 Title: Emo-Music Player Author: Sarvesh Pal, Ankit Mishra, Hridaypratap Mourya Most music-loving users find themselves in an odd situation when they do not find songs to suit their mood in the situation. Ever since computers were developed, scientists and engineers thought of artificially intelligent systems that that are mentally and/or physically equivalent to humans. In today's world, with the development in technology and multimedia, there are many music players which have various features like fast forward, variable playback speed, local playback

Chapter 3 SYSTEM ANALYSIS:

3.1 Software Requirements Analysis A software requirements definition is an abstract description of the services, which the systemshould provide, and the constraints under which the system must operate. It should only specify only the external behavior of the system and is not concerned with system design characteristics. It is a solution, in a natural language plus diagrams, of what servicesthe system is expected to provide and the constraints under which it must operate.

- Software resources required:

1. Operating System- Windows7 and Above
2. IDE:- Vscode
3. Database: MySQL
4. Front End:- HTML,CSS,Python,Javascrip

3.2 Hardware Requirements Analysis Hardware Requirements Analysis is to define and analyze a complete set of functional, operational, performance, interface, quality factors, and design, criticality .

- Hardware resources required

1. System: intelcorei5-3337U1.80GHz.
2. Hard Disk:500GB.
3. Floppy Drive:1.4mb
4. Mouse: Logitech or any. RAM:512MB. 4.9

Chapter 4 System Design:

This describes the process of building and monitoring schedule for software development. To build complex software systems, many engineering tasks need to take place in parallel with one another to complete the project on time. Task network Tasks will be distributed amongst the team members in a sequential manner and hence the task network is clearly a plain straight line.Communi*cation* Software development process starts with the communication between customer and developer. According to need of project, we gathered the requirements related to project. Requirements analysis is communication intensive activity. If there is misinterpretation in requirement analysis, the wrong design will be implemented

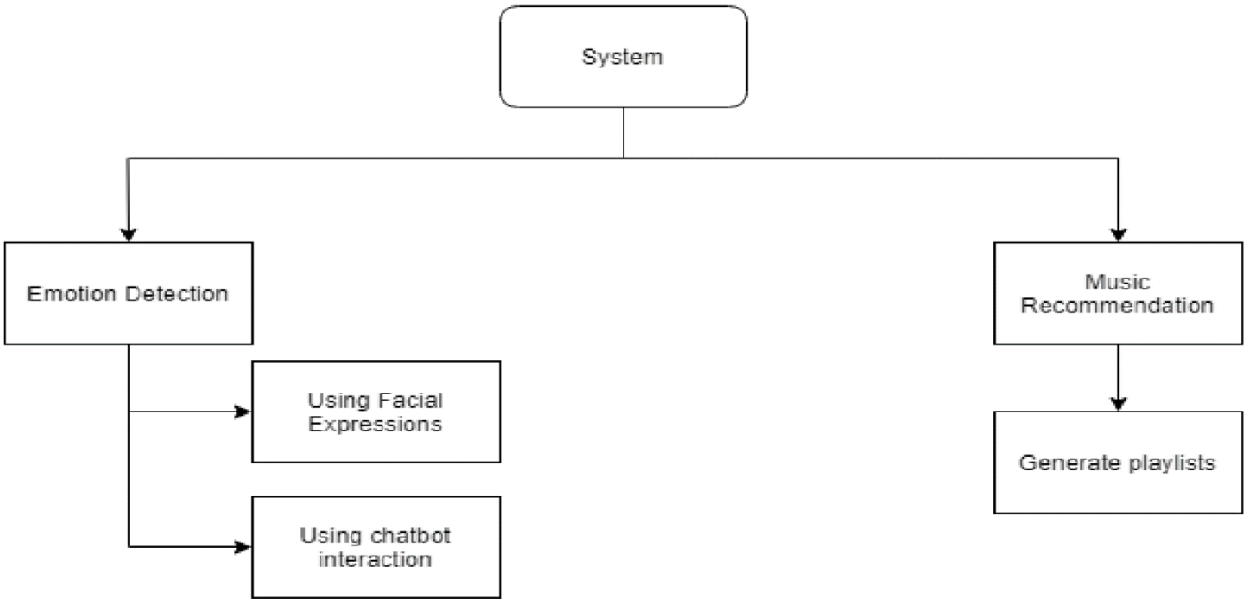

Fig.1: Architecture Diagram

Emotion Extraction Module -The image of the user is captured with the help of a camera/webcam and ERC is done through chatbot . Once the picture captured and chatbot conversation is obtained, the frame of the captured image from webcam feed is converted to a grayscale image to improve the performance of the classifier, which is used to identify the face present in the picture and chatbot conversation is compared.
These images and conversation will be used to train the classifier so that when a completely new and unknown set of images is presented to the classifier, it is able to extract the position of facial landmarks from those image based on the knowledge that it had already acquired from the training set.

Chapter 5 Relevant Mathematics Associated With The Project :

Let U be the Whole system which consists:
U=f U1,U2Un g

Where, S is the Smart Music Player system which detects the infacial expressions of user.

Pro is the procedure applied to the system to process the given input.
OP is the output of the system.

1.• call scripts :
• Input: comments
• Output: Predictions

2. Take object: :
• Input: comments
• Output: Predictions

3. Input Parameter :
• Input: comments
• Output: Predictions

Chapter 6 Conclusion:

The results obtained above are very promising. The high accuracy of the application and quick response time makes it suitable for most practical purposes. The music classification module in particular, performs significantly well. Remarkably, it achieves high accuracy in the angry category, it also performs specifically well for the happy and calm categories. Thus, it reduces user efforts for generating playlists. It efficiently maps the user emotion to the song class with an excellent overall accuracy, thus achieving optimistic results for 4 moods.

Chapter 7 Bibliography:

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