IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

EMOTION BASED MUSIC RECOMMENDATION SYSTEM

[1]Sangani Prathyusha, [2]Atmakur Ramakanth, [3]V.Nikhitha

[1]Student, [2]Student, [3]Student

[1]Computer Science and Engineering,

[1]Sreenidhi Institute of Science and Technology, Hyderabad, India

Abstract: Human emotions are not uniform, they are the result of internal and external events that occur around the person. Music lovers and consumers can value music as a great way for people to express themselves. With the development of technology, there are more and more musicians and more and more people who love music, which leads to competition for music selection. Music recommendations have been around for a while, but they were mostly created after learning about users' tastes over time. People's emotions are well studied and invested, which will lead to many applications .Available systems vary by genre, artist, etc. Includes automatic creation of music playlists based on Another way is to manually sort music files into playlists. Recent problems include frequency estimation and similar music calculations. The QBSH (Question Singing and Humming) system determines a song using its content (key and tempo). But the problem with this option is that they take a long time and don't necessarily make the customer happy .The proposed method yielded very good results and paved the way for further research in this area.

I. INTRODUCTION

Many studies over the past few years have confirmed that music has a significant impact on the way the human brain works. In a study of why people perceive music, researchers found that music is important in connecting arousal and mood. It has been found that musical taste is closely related to emotions and behaviors. A person's facial expression is highly effective in determining their thoughts and behaviors. People's feelings are important in expressing an idea. It is one of the six basic emotions such as surprise, fear, anger, fear, happiness and sadness. Changes in the appearance, size, and movement of the eyebrows, eyes, and lips can be used to describe these feelings. Today's connected devices provide instant access to millions of songs. A person's mood can change at any time with music. Our main goal is to get music playlists from the judgment of people's emotions .Only a few mobile platforms like Spotify, Saav ,Wynk have cut the music. Here users can choose to create their own playlists or listen to playlists pre-created by the software. Legend has it that the best healing tool in the world is music. So we use the instruments of this music for the benefit of the emotional person. This is due to advances in subtraction and signal processing technology. We propose to use facial expressions as a recommendation engine for emotion recognition , which can identify the user's emotions and provide appropriate music selection. If the agreement is negative, a happy song is played to cheer the person up. Also, if the mood is positive, a special playlist of different music genres is played to encourage positive emotions. This study presents an emotion recognition model where the system monitors users' facial expressions in real time to identify their emotions and the results are combined with music from the user's music collection to create music playlists (sound model).The idea is to improve the user's mood by playing music that matches the user's interests and also taking pictures of them. Feature extraction can be done in deep learning. This sets it apart from many machine learning algorithms that require some level of human involvement. In this way, we can create smarter machines. By combining input from previous models, features in deep learning are trained and learned. With this approach, they can make connections, find topics, and deliver the best results. Special results or articles are output methods of deep learning. These results are used to predict, for example, given the input and output, we can say that the picture has an 85% chance of showing the person. The result of the emotional analysis based on the image used by the SoftMax layer of the design would be very helpful.

LITERATURE

S. Mtilda Florence and M. Uma, in their 2020 article "Exploring Emotions by User Faces and Recognizing Music", developed a system that can recognize the user's thoughts in their article and remove facial markings based on that expression. These facial features are classified to identify the unique needs of the wearer. After the user's wishes are determined, music is played for them, indicating his request. It allows users to choose the music they want to listen to relieve stress. Users do not need to spend time browsing or searching for songs. The design consists of three modules: sound restoration, emotional retrieval, and emotional filtering. However, since there are not enough visuals in the images used, the plan has many shortcomings such as not being able to capture all the emotions. The image received by the processor must be taken in a well-lit area to obtain the correct image. To accurately predict user intent, the distributor needs an image with a resolution of at least 320p. Handcrafted features often don't translate well in the wild.

ALGORITHMS

Convolutional neural networks have been developed to recognize patterns and features in images with high accuracy. Another advantage of CNNs is their ability to identify the most important features of an image without human assistance. CNN consists of two parts: feature extraction and segmentation. Feature extraction is done using convolutional layers and pooling layers. The convolutional neural network model created in the project helps predict fashion images to be submitted to the site. The backend uses a machine learning model to predict fashion tags. In the ML model, we first need to import all the necessary libraries such as keras, numpy, matplotlib to be used in our project. The next step is to load the fashion mnist dataset from keras and use the function to split it into train, test and valid data. Now we create all the necessary files that we want to show the fashion images in the class.After trying to analyze the image we loaded from the file using matplotlib and checking the image of our data distribution, we can convert it to the appropriate form required by the Ml CNN model. Here the simple model learns from various experiences in the data to be able to predict the fashion image. Now we test our model with test data to check how well our model works. To do this, I use matplolib to print the plots and their predictions. Finally, we print a classification map with a confusion matrix showing the number of tags scored in the matrix using different metrics such as accuracy, recall, f1 score, and support. Finally save the model. In this project, we built a CNN model by adding layers to increase the accuracy of each model and prevent overfitting neurons. So basically, ML models can help predict the trendy clothes that appear on your website.

MODULES:

1. Image Capturing In this module, the system must detect the user's face. Face recognition: In this, the user's face will be used as input. Design a convolutional neural network to analyze user behavior. Sensitivity detection: After extracting the features of the user's image to determine the sensitivity, the system will provide a reading according to the user's sensitivity.

2.Pre-Processing Preprocessing includes image filtering and normalization to create image similarity and rotation. Normalization: For example, an image of a person looks slightly white due to backlighting. In this case, the face becomes blurred and difficult to distinguish, and the main thing is serious damage. So in this case I need to somehow remove the white background and improve the face.

3.Segmentation Based on parameters such as texture, density, and edges, images are classified by a process called image segmentation. This is an important step in image classification. Instead of doing the above, we divide the image into homogeneous areas. This process provides the power to achieve greater accuracy while dividing emotions.

4. Feature extraction Feature extraction refers to the process of converting raw data into numerical features that can be processed while retaining information in the original data set. This provides better results than applying machine learning directly to raw data. A CNN is a neural network that extracts features from an input image and classifies features from other images. The input image is classified by a neural network using the extracted signals.

5. Emotion Classification Emotions plays an important role in how people perceive others. It also affects the way you live and interact with others. It can be said that we are all governed by these various emotions. These thoughts determine how we respond to any action, whether voluntary or involuntary. Every decision we make, everything we do depends on what we are doing now. That's why they say: Don't decide when you're angry.

Software Requirements:

- OS: Windows 7 and above /UBUNTU
- Programming Language: Python
- Software: JetBrains PyCharm Community Edition 2017.1.4 x64
- Backend: Keras
- Additional requirements: TensorFlow

Hardware Requirements :

The hardware requirements are as follows:

- Processor: Intel I3 processor
- Storage Space: 500 GB.
- Screen size: 15” LED
- Devices Required: Web camera, Mouse and a Keyboard
- Minimum Ram: 4GB and a good Internet connection

SYSTEM DESIGN :

It provides an emotion-recognition recommendation system that can detect a user's emotion using facial expressions and recommend a list of matching songs. The proposed system captures a person's emotions, and if a person has negative emotions, a specific playlist is displayed, including the most appropriate types of music that will make them feel better. And if your emotions are positive, you'll get a special playlist with different music to evoke positive emotions. The dataset used for emotion detection came from Kaggle Facial Expression Recognition. The music player dataset was generated from songs. The implementation of facial emotion detection is done using a convolutional neural network that gives about 95.14% accuracy

IMPLEMENTATION:

Languages we used in our project are:

●Python: It provides an emotion-recognition recommendation system that can detect a user's emotion using facial expressions and recommend a list of matching songs. The proposed system captures a person's emotions, and if a person has negative emotions, a specific playlist is displayed, including the most appropriate types of music that will make them feel better. And if your emotions are positive, you'll get a special playlist with different music to evoke positive emotions. The dataset used for emotion detection came from Kaggle Facial Expression Recognition. The music player dataset was generated from songs. The implementation of facial emotion detection is done using a convolutional neural network that gives about 95.14% accuracy.

- Numpy : NumPy is a Python library for linear algebra. An open-source Python package representing Numerical Python.
- Keras: Keras is a high-level library built on top of Theano or TensorFlow. Provides a scikitlearn style API for building neural networks
- Tensorflow: It provides a comprehensive and flexible set of tools, libraries, and community resources that enable research to support modern machine learning.

DATASET:

File contains a 48x48 px grayscale portrait. Because face registration is not automatic, all faces in all images are in approximately the same position and are mostly neutral. Place each face into one of seven groups according to the emotion expressed (0 anger, 1 hate, 2 fear, 3 happy, 4 sad, 5 surprise, high). The training set contains 28,709 examples, but the common language contains 3,589 examples.

ADVANTAGES OF THE SYSTEM:

1. Existing models use a Support Vector Machine (SVM) algorithm to classify emotions, whereas we use a Convolutional Neural Network (CNN), which is more advanced and efficient than SVM.
2. One of the most unique features of CNNs is their ability to recognize the most important features of an image without human assistance. It is non-linear and is specifically designed to recognize patterns that are characteristic of images with high accuracy.
3. The hidden layers used in CNN are proven to be more efficient because the complexity of the model increases as more layers are added, giving better results. Each image is converted to an array of pixels, which is not the case with SVM.
4.SVM was the most popular image classification method before the advent of CNN. SVM is a supervised learning method used to classify data. Best known for regression analysis. It is a linear classifier whose complexity increases as the number of training data sets increases. Using 70% of the test data, an accuracy of 46.74% was achieved.

CONCLUSION

Since music has the ability to express the emotions of the user, the general model is used to represent the music according to the emotions of the user. Human emotions play an important role in expressing personal feelings. The main purpose of the system is to detect changes in the user's mood and play music according to the user's preferences by searching for various types of music. The system uses a CNN algorithm for emotion classification, which can be determined by changes in the shape, size, and movement of the eyebrows, eyes, and mouth. They belong to one of the six emotions, Sadness, Joy, Anger, Fear, Disgust, and Surprise when creating the playlist. The main reason for using the CNN algorithm over SVM is that it can identify the most important features in an image without human assistance. In addition, the prediction accuracy of DVM was found to be lower than the accuracy of CNN. The proposed system gave very good results. It is difficult to reach 100% accuracy because people's thoughts are not the same and are the result of internal and external events occurring in the person's environment.

ACKNOWLEDGMENT

I would like to express our gratitude to Dr.Sundharagiri Dheeraj behind the screen who helped us to transform an idea into a real application.

REFERENCES

1. Anagha S. Dhavalikar and Dr. R. K. Kulkarni “Face Detection and Facial Expression Recognition System “Institute of Electrical and Electronics Engineers (IEEE 2014)
2. Byeong-jun Han &Seungmin Rho Sanghoon Jun enjunHwang”Music emotion classification and context-based music recommendation” Springer Science + Business Media, LLC 2009
3. Renata Lopes Rosa, DemóstenesZegarra Rodríguez and GraçaBressan“Music Recommendation System Based on User’s Sentiments Extracted from Social Networks”2015 IEEE International Conference on Consumer Electronics (ICCE)
4. Yajie Hu and MitsunoriOgihara “NEXTONE PLAYER: A MUSIC RECOMMENDATION SYSTEM BASED ON USER BEHAVIOUR”12th International Society for Music Information Retrieval Conference (ISMIR 2011)
5. Kyoungro Yoon, Senior Member, IEEE, Jonghyung Lee, and Min-Uk Kim “Music Recommendation System Using Emotion Triggering Low-level Features”IEEE Transactions on Consumer Electronics 2012
6. Fang-Fei Kuo1, Meng-Fen Chiang2, Man-Kwan Shan2 and Suh-Yin Lee “Emotion Based Music Recommendation by Association Discovery from FilmMusic” 2005
7. Yu-Hao Chin, Jia-Ching Wang, Senior Member, IEEE, JuChiang Wang, and Yi-Hsuan Yang, Member, IEEE”Predicting the Probability Density Function of Music Emotion using EmotionSpace Mapping” IEEE 2018
8. Hye-Rin Kim, Yeong-Seok Kim, SeonJoo Kim, In-Kwon Le”Building Emotional Machines: Recognizing Image Emotions through DeepNeural Networks”IEEE TRANSACTIONS ON MULTIMEDIA 2018

9. DegerAyata, Yusuf Yaslan and Mustafa E. Kamasak "Emotion Based Music Recommendation System Using Wearable PhysiologicalSensors"IEEE TRANSACTIONS ON CONSUMER ELECTRONICS, 2018
10. AnukritiDureha "An Accurate Algorithm for Generating a Music Playlist based on Facial Expressions "IJCA 2014
11. AnaghaS.Dhavalikar and Dr. R. K. Kulkarni, "Face Detection and Facial Expression Recognition System" 2014 International Conference on Electronics and Communication System (ICECS -2014).
12. Yong-Hwan Lee , Woori Han and Youngseop Kim, "Emotional Recognition from Facial Expression Analysis using Bezier Curve Fitting" 2013 16th International Conference on Network-Based Information Systems.
13. ArtoLehtiniemi and Jukka Holm, "Using Animated Mood Pictures in Music Recommendation", 2012 16th International Conference on Information Visualisation.
14. F. Abdat, C. Maaoui and A. Pruski, "Human-computer interaction using emotion recognition from facial expression", 2011 UKSim 5th European Symposium on Computer Modelling and Simulation.