

A RESEARCH PAPER ON
“EMOTION BASED MUSIC RECOMMENDATION
SYSTEM”

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ABSTRACT

Music can make us emotional; for this reason it is often referred to as the "language of thought". This work explores theory in addition to labels of deep learning models to improve existing music.

We've taken a whole new approach to auto playing music using facial expressions.. Most old or current methods involve playing music manually. We use convolution neural networks for emotion detection.. For music recommendations, Machine learning concepts are used. Our proposed system tends to reduce the calculation and computational in obtaining the results and the overall cost of the designed system, so increasing the system's overall accuracy. Testing of the system done on dataset FER 2013. Facial expressions are captured by web camera. Emotion detection is done on provided face video to detect emotions such as natural, angry, surprise, happy, sad. By detecting current emotion automatic playlist is generated.

This exercise will collect thoughts on the specific meaning of each song in the sample file. Because the effect of music on emotions is subjective and varies from person to person, this study will require a large sample size to reduce content. Due to limited resources, some of the knowledge will be taken from the disciplinary perspective and the rest from the active learning model. It uses GAN (Generative Adversarial Network) to create consensus-based content. This work leads to two types of feedback, emotional and non-emotional. Two measures, cosine similarity and Euclidean distance, are used to evaluate the accuracy of the model. The results showed that the difference was not significant and the utility model was not relevant. It can be concluded that consensus as a feature in aesthetic vision is promising. More research is needed to use better resources to reduce some problems and improve the extraction of emotional information.

Keyword-

Collaborative filtering, Emotion Recognition, Linear classifier, Facial Landmark Extraction, SVM Classification, Learning (Artificial Intelligence), Music, Recommender Systems, Machine Learning

INTRODUCTION

The growth of the Internet continues to create many social changes related to communication and lifestyle. Many studies in recent years have recognized that people react and respond to music, which has high impressions of human brain activity. In a study conducted to explain why people listen to music, researchers found that music plays a crucial role in the connection between arousal and mood. Two of the most important functions of music are its ability to help its participants lift their mood and become more self-aware. Musical preference has been shown to be strongly correlated with personality traits and emotions. The beat, timbre, rhythm and pitch of music are regulated in areas of the brain that affect mood and emotion.

The increase in bandwidth has led to the birth and subsequent transmission of data sharing. This system, called peer-to-peer software, allows users to share information stored locally on their computers with other users connected to the same system. These peer-to-peer relationships have changed the music industry.

International organizations often focus on promoting specific artists, sometimes because radio executives or editors value the quality of their music, and sometimes just because of the increase in money. Some people listen to these stations and read the news to decide how to buy the music: from a regular source or from some joint venture. Music professionals have the opportunity to provide users with not only commercial "beautiful" tools, but also works by emerging bands, rare bands and independent writing.

Music is now easier to find, store, and cheaper to obtain. This new situation has led to massive storage of music for sharing and has impacted the way music is made, moving from full production to creating playlists directly. The continuous increase in connection speed and the trend in web development technology have resulted in an increase in the number of major websites accessed daily. Some of these technologies allow users to listen to music online without downloading it to their personal computers. This question solves a big problem with peer-to-peer software.

Emotion detection is considered to be the most important technique used in many applications, such as smart card applications, surveillance, image database investigation, crime, video indexing, civil applications, security and adaptive human-machine interfaces for multimedia environments. With the development of digital signal processing technology and other efficient feature extraction algorithms, automatic emotion detection in multimedia features such as music or movies is developing rapidly, and this system can play a role important in many potential applications, such as human-computer interaction systems and musical entertainment. We use facial expressions to provide an intuitive visual experience that can capture the user's emotions and suggest appropriate playlists.

The proposed system detects a person's mood, and if the person has negative emotions, a specific playlist will be displayed which includes the most relevant music genres that can improve their mood. If the mood is positive, a specific playlist is displayed with different types of music that can enhance the positive mood.

OBJECTIVE

Based on the concept of machine learning, it is programmed to search and interpret data to create playlists based on rules or restrictions.

It provides a link between music and also provides great entertainment for users.

A new age platform for music lovers that bridges the gap between technological innovation and musical refinement.

People's emotions are changing and constantly changing over time, so it's important to observe people's emotions and collect results for classification.

EXISTING SYSTEM

Using Animated Mood Pictures in Music Recommendation- Arto Lehtiniemi and Jukka Holm proposed system on animated mood picture in music recommendation. On this system the user interact with a collection of images to receive music recommendation with respect to genre of picture. This music recommendation system is developed by Nokia researched center. This system uses textual meta tags for describing the genre and audio signal processing.

Emotion-Based Music Proposal. Association Discovery from Film Music. Fang-Fei Kuo et al. and Suh-Yin Lee et al. Current recommendations are based on users' preference for music. But sometimes the has to be seen as beautiful as it is thought to be. In this article, we present a new visual perception model based on emotions, based on associations discovered from music videos. We are working on music feature extraction and modifying the affinity graph to find the relationship between emotion and music features. Experimental results show that the proposed method provides almost full accuracy on average.

Music Based on Face Recognition An Accurate Algorithm for Creating Playlists- Anukriti Dureha et al. Here it presents a separate Guide from playlists and description of songs which are labor intensive and time consuming depending on the current mood of the user. Many algorithms have been proposed to automate this process. However, current algorithms are slow and using additional hardware increases the overall cost of the system and is not accurate. This article introduces the algorithm that automatically creates audio playlists based on the user's facial expression, saving for processing, saving time and manpower, and investing to do the operation manually. The algorithm mentioned in this article is to reduce the total computation time and design cost. It is also designed to increase the accuracy of the design system. The face recognition module of the proposed algorithm has been validated with the test against user interface and user-independent datasets.

PROPOSED SYSTEM

Human faces play an important role in understanding the emotions of people.

The web camera is therefore used to get the required input. One of the applications of this feedback would be to extract expression data of person, derived from the previous entry, are used to derive the song title. Manually sorting or grouping songs into separate lists reduces the tedious task and simplifies the creation of suitable playlists according to one's preferences. Face Media Based Music is designed to browse and translate files and create playlists based on parameters. That's why our plan focuses on creating emotion-based music up to emotional awareness. There is also a short introduction to our functionality, animation and distribution. In this project we use pycharm tool for analysis.

METHODOLOGY

- FACE DETECTION:

The main objective of face detection technique is to identify the face in the frame by reducing the external noises and other factors. The steps involved in the FACE DETECTION PROCESS are

1. Image pyramid
2. Histogram of Oriented Gradients
3. Linear Classifier

The data that are obtained are decomposed into the sampling image using image pyramid into multiple scales. The use of this technique is simply to extract features while reducing the noise and the other factors. The low pass image pyramid technique (also known as Gaussian pyramid) consists of smoothing the frame and sub sampling it by decreasing its resolution, the process needs to be repeated a few times in order to obtain a perfect result that in the end of the process we obtain a frame similar to the original one but with a decreased resolution and an increased smoothing level.

Commonly used to detect objects in images in the field of image processing, HOG is a feature descriptor, a technique that counts occurrences of gradient orientation in a localized portion of an image. The main objective of using this technique is to describe the face within the image with a set of distributions of intensity gradients.

The linear classification step is the last step in the face detection process. We simply used the linear classifier instead of the SVM to decrease the computational time that the classification process will take and so to guarantee a faster face detection operation.

- **EMOTION CLASSIFICATION:**

When the face is successfully detected, a bounding box will be applied as an overlay on the image to extract the ROI (face) for further analysis. The extracted ROI will next be processed using the “Predictor” function which is also a called script to extract the 68 facial landmark points and save them in an array. Next, the data stored in the features array will be put in as an input into a PCA reduction code that will reduce the size of data and eliminate any correlated coordinates leaving only the necessary points as principal components. The data is a 68x2 array; 68 points, each point with coordinates on x-axes and y-axes. The array will be converted into a vector containing 136 row and 1 column. The facial landmark extraction code “Predictor” is trained with a set of images and landmark maps for each image.

- **MUSIC RECOMMENDATION:**

The input is acquired in real-time so the camera is used to capture the video and then the framing are done. The hidden markov model classification is used for processing the framed images. The frames that are obtained are considered in all frames and all pixel formats for the purpose of emotion classification. The value of each landmark in the face is calculated and is stored for future use. The efficiency of classifier is about 90-95%. so that even when there is any changes in the face due to environmental conditions the system can still identify the face and the emotion being expressed .The emotions are then identified using the values that are obtained that are being set and from the value of the pixel that is received is being compared to that of the values that is present as threshold in the code. The values are transferred to the web service. The song are played from the emotion detected. The emotions are assigned for every song. When the emotion is transferred the respective song will be plays. There are four emotions that can be used and the emotions are anger, sad, surprise, happy. When the happy emotion is recognized the songs that are assigned for that particular emotion are played and the same happens with the other emotions as well that is it the songs are played for the emotions detected respectively.

CONCLUSION

In this project, we presented a model to recommend a music based on the emotion based detected from the facial expression. This project proposed designed & developed an emotion based music recommendation system using face recognition System. Music are the one that has the power to heal any stress or any kind of emotions. Recent development promises a wide scope in developing emotion based music recommendation system. Thus the proposed system presents Face based emotion recognition system to detect the emotions and play music from the emotion detected.

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