YOUTUBE PLAYLIST RECOMMENDATION BASED ON FACIAL EXPRESSIONS USING CONVOLUTIONAL NEURAL NETWORKS

N Harini[1], Polamarasetty Soniya[2], Pasupuleti Shivani[3], Rowthu Hemalatha[4], Sabbavarapu Deepika[5]
[1,2,3,4,5]Assistant Professor, Department of Computer Science and Engineering, Vignan's Institute of Engineering for Women, Visakhapatnam, Andhra Pradesh, India

ABSTRACT
Human feelings are not constant, and they are a consequence of internal and external circumstances happening around an individual. Extensive research and investment have been made in human emotions, which can lead to a variety of applications. The current system consists of automatically creating a music playlist based on its genres, artists, etc. Yet another option ismanually organizing music files into playlists. Recent problems involve multiple frequency estimation and music similarity computation. A Query By Singing and Humming (QBSH) system determines a song by using its contents (tune and rhythm). However, the problem revolving around this option is that it is time-consuming and does not always satisfy the user. In the existing system, the emotions of the user are not taken into consideration. Since emotions play a crucial role in day-to-day activities, a music recommendation system can be developed that takes human emotions into account. By identifying the emotions of an individual, suitable mood-relaxing music can be recommended. The system aims at examining the data provided by identifying the emotions of the user. A deep learning (CNN) algorithm is applied to classify the various emotions, after whichlabels are generated and suitable music is played. The proposed system has delivered results with significant accuracy.
Keywords: Emotion recognition, Music recommendation, Human feelings, Emotion-based playlist creation, Deep learning(CNN), Automatic playlist generation.

INTRODUCTION
In today's digital landscape, where internet-connected devices are ubiquitous, our relationship with music is poised for transformation. Human emotions, conveyed through subtle facial expressions and body language, provide rich insights into our inner world. Music serves as a steadfast companion, resonating with our deepest feelings and offering solace amidst life's complexities. With the advent of streaming platforms like Wynk and Saavn, individuals wield the power to curate their emotional experiences instantly, accessing a vast library of songs at their fingertips. Moreover, apps like Shazam and Sound Hound facilitate seamless song identification, expanding musical horizons. Looking ahead, harnessing modern technology promises dynamically curated playlists tailored to users' emotional states, transcending conventional genre categorization. This personalized approach not only enriches our emotional well-being but also fosters cultural connectivity, positioning music as an empathetic companion that navigates life's highs and lows alongside us.

In this evolving landscape, the intersection of human emotions and technology promises a deeper, more intimate musical experience. As we navigate the digital realm, facial expressions and body language offer windows into our emotional landscapes. Music, as a universal language, provides solace and resonance, reflecting our innermost feelings. With the proliferation of streaming platforms and music identification apps, the accessibility of vast musical libraries has never been easier. Looking forward, the fusion of these advancements holds the potential to revolutionize music consumption. By dynamically curating playlists based on users' emotional cues, technology transforms music from a mere background soundtrack to an empathetic companion, accompanying individuals through the ebb and flow of life's emotional journey.

LITERATURE SURVEY

"Exploring Convolutional Neural Networks for Enhanced Facial Recognition[1]" In response to the COVID-19 pandemic, people identification has gained prominence, prompting exploration of contact-based technologies. Face recognition, a challenging task with no singular solution, spans both still photos and video, demanding robust automated systems. Our study evaluates the efficacy of Convolutional Neural Networks (CNNs) and diverse datasets, aiming to enhance authentication security through advanced CNN classifiers tailored for facial recognition tasks.

"Music recommendation system by observing the sentiments of users and polarity of words[2]" To reduce the dimensions, data related to music is gathered, after which NMF is applied to map them to ESTM. The sentiment intensity metric (Sentimeter-Br2) is used to extract anindividual emotion from social networks. Sentiment-Br2 is a sentiment intensity metric whose main goal is to improve the overall accuracy and efficiency of music recommendation systems. Thewords extracted from social media are ranked positive, negative, or neutral based on sentiment intensity, according to which a musical playlist is generated and played to the respective user. A framework is created where the user registers by providing the necessary details and creating a login account. Every time the user posts some content, the phrases used by him are collected and stored. These words are then analyzed on a day-to-day basis and classified by the sentiment metric system. Based on the mood of the individual and his or her preference, a playlist is generated and played by the user. The results showed that 72.5% of the total number of users considered the proposed recommendation system to be more useful than the traditional recommendation system.

"Context-Aware Music Recommendation: Integrating Emotion State Transition Model and Ontology-Based Representation[3]"In the burgeoning field of context-based music recommendation, this paper introduces three pivotal contributions. Firstly, a novel Emotion State Transition Model (ESTM) is proposed, bridging user situation information, emotions, and low-level music features to recommend music conducive to desired emotional states. Secondly, the Context-Based Music Recommendation (COMUS) ontology is introduced, facilitating the modeling of user musical preferences and context, including mood and situational factors, to inform recommendation decisions. Lastly, employing Nonnegative Matrix Factorization (NMF) for dimensionality reduction and Support Vector Machine (SVM) for emotional state transition classification, a prototype recommendation system is developed. Experimental results demonstrate the system's efficacy in recommending music tailored to users' emotional needs and preferences.

"Enhanced Sentiment Metric-Based Music Recommendation System[4]"This paper presents a novel music recommendation system leveraging an enhanced Sentiment Metric (eSM), which integrates lexicon-based sentiment analysis with user profile correction factors. The eSM adjusts sentiment intensity based on user-specific preferences, refined through subjective tests in a controlled laboratory environment. Extracting sentiments from social media posts, the mobile-friendly framework suggests songs tailored to the user's current sentiment, prioritizing usability. With a remarkable 91% user satisfaction rating, the system outperforms random song suggestions. Furthermore, the framework demonstrates minimal impacts on energy consumption, network usage, and latency, promising advantages for consumer electronics.

EXISTING SYSTEM

Existing models traditionally rely on the Support Vector Machine (SVM) algorithm for emotion classification. However, we take a bold step forward by harnessing the power of the Convolutional Neural Network (CNN), a cutting-edge approach that surpasses SVM in effectiveness and sophistication. What makes CNN truly remarkable is its autonomous ability to uncover crucialimage features without human intervention. These networks are dynamic, non-linear, and purpose-built to detect intricate patterns within images with unparalleled accuracy. Moreover, the hidden layers within CNN contribute to its effectiveness. As the model's complexity increases with additional layers, so does its performance, delivering outstanding results. In contrast, SVM, although once the gold standard, operates linearly and struggles with intricate datasets. Before the rise of CNN, SVM reigned supreme in image classification, yet its limitations are apparent. While SVM excels in supervised learning and regression analysis, it pales in comparison to CNN'sprowess in handling complex visual data.

Disadvantages

1. The existing methodology uses the SVM algorithm for data classification. Only 46.74% was attained when 70% of the data was tested. They need high parameter tuning since they are non-parametric models.

2. In the existing system, the emotion of the user is not taken into consideration. • Recent issues involve multiple frequency estimation and music similarity computation.

3 A QBSH (query by singing and humming) system determines a song by using its contents (tune and rhythm). However, the issue revolving around this option is that it is time-consuming and does not always satisfy the user.

PROPOSED SCHEME

"In our paper, we focus on crafting personalized playlists based on individual moods. Utilizing a camera with user consent, we capture images or upload pictures by the user to discern the user's emotional state. These images undergo rigorous processing stages, which include Preprocessing, feature extraction, emotion classification, and web service integration. Employing a Convolutional Neural Network (CNN) that enables precise emotion classification. Each emotion corresponds to a distinct value, allowing us to match the user's emotional state. By identifying the user's emotions, the system recommends suitable music that relaxes the user's mood accordingly. Our proposedsystem demonstrates significant accuracy, paving the way for further advancements in this field.

ADVANTAGES

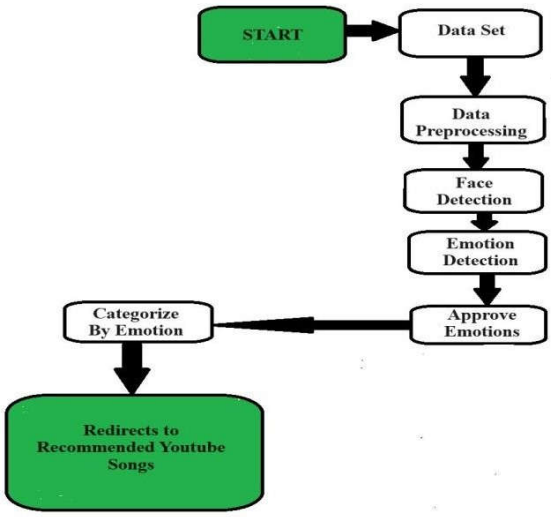
- Existing models use the support vector machine (SVM) algorithm for emotion classification,whereas we use the Convolutional Neural Network (CNN), which is more advanced and effective compared to SVM.
- One of the most unique features of CNN is its ability to recognize the most important features in an image without any help from humans. They are nonlinear and were developed especially to recognize patterns and features within an image with high accuracy.
- The hidden layers used in CNN are proven to be more effective because, as we add more layers, the model complexity increases, which yields better results. Every image is convertedto an array of pixels, which is not the case with SVM.

THE DESIGN STRUCTURE

The Emotion-Based Music Recommendation System is engineered to deliver a personalized music experience by leveraging advanced technologies such as Convolutional Neural Networks (CNN) for facial emotion recognition. At its core, the system features a sophisticated CNN model that processes facial images captured in real-time or uploaded by users. This CNN model is trained to accurately detect and classify various emotions expressed in the facial expressions of users.

Upon analyzing the user's emotional state, the system utilizes the detected emotions as input to a recommendation algorithm. This algorithm, enhanced by CNN's precise emotion classification, suggests music genres or playlists that align with the user's mood. The recommendation engine considers factors such as the intensity and combination of emotions to provide tailored music suggestions that resonate with the user.

By integrating CNN technology into the emotion detection module, the system achieves a high level of accuracy in understanding user emotions, thus enhancing the quality of music recommendations. This ensures that users receive personalized music suggestions that accurately reflect their emotional state, leading to a more engaging and fulfilling music listening experience.



OUTPUT SCREENS:

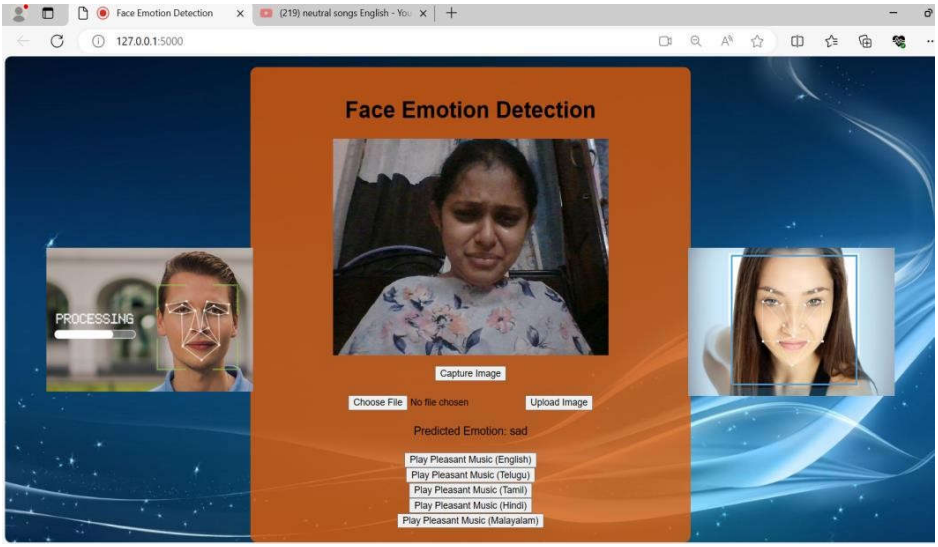


Fig 1: Image Capturing

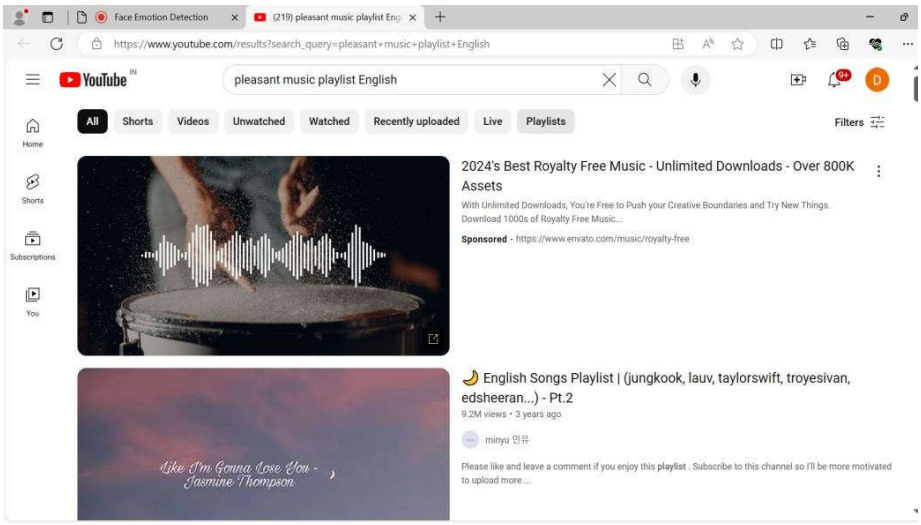


Fig 2: Mood Relaxing Music

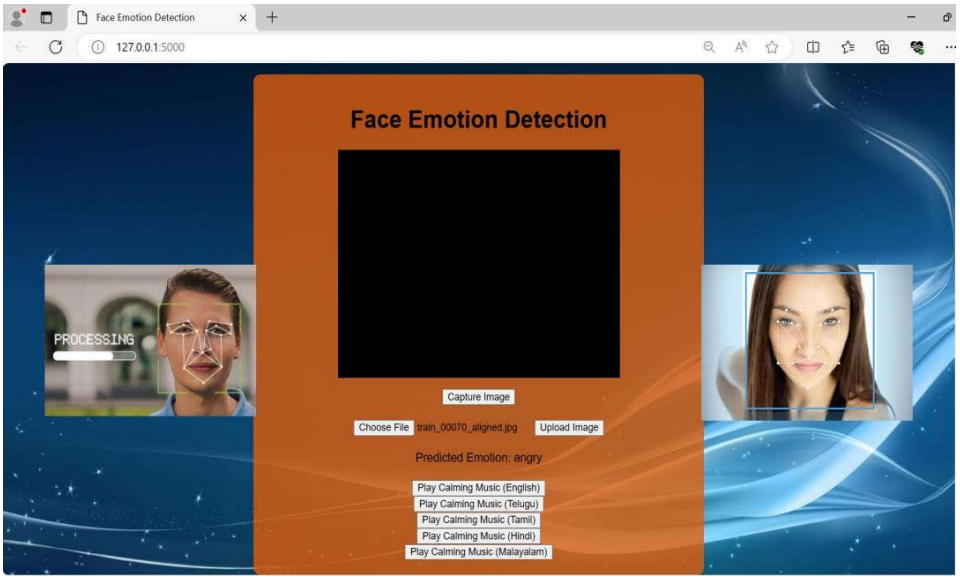


Fig 3: Image Uploading

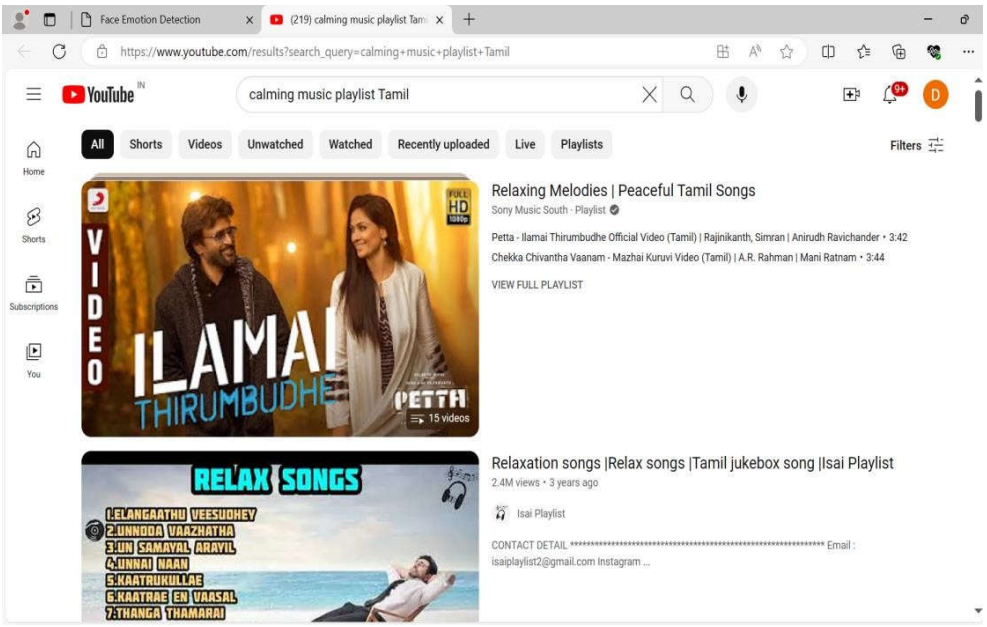


Fig 4: YouTube redirection with mood-relaxing music

CONCLUSION

In this paper, we've named supervised literacy fashion Random Forest to classify the alert as fraudulent or authorized. The classifier will be trained using feedback and a delayed supervised sample. Next, it'll aggregate each probability to describe cautions. Further, we proposed a learning-to-rank approach where alerts will be ranked grounded on precedence. The suggested system will be suitable to break the class imbalance and conception drift problem. The Random timber algorithm will perform better with a larger number of training data, but speed during testing and operation willsuffer. Operation of further pre-processing ways would also help the algorithm will perform better with a larger number of training data, but speed during testing and operation will suffer. Operation of further pre-processing ways would also help.

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 &EenjunHwang”Music emotion classification and context-basedmusicrecommendation” 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 "NEXT ONE 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 frTrans.NeuralNetw. Learn. Syst., vol. 28, no. 2, pp. 246–258, Feb.2016.

[6] Fang-Fei Kuo1, Meng-Fen Chiang2, Man-Kwan Shan2, and Suh-Yin Lee "Emotionbased Music Recommendation by Association Discovery from FilmMusic".

[7] AnaghaS.Dhavalikar and Dr. R. K. Kulkarni, "Face Detection and Facial Expression Recognition System" 2014 International Conference on Electronics and Communication System (ICECS -2014).

[8] 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.

[9] ArtoLehtiniemi and Jukka Holm, "Using Animated Mood Pictures in Music Recommendation", 2012 16th International Conference on Information Visualisation.

[10.]F.Abdat, C. Maaoui and A. Pruski, "Human-computer interaction using emotion recognition from the facial expression", 2011 UKSim 5th European Symposium on Computer Modelling and Simulation.