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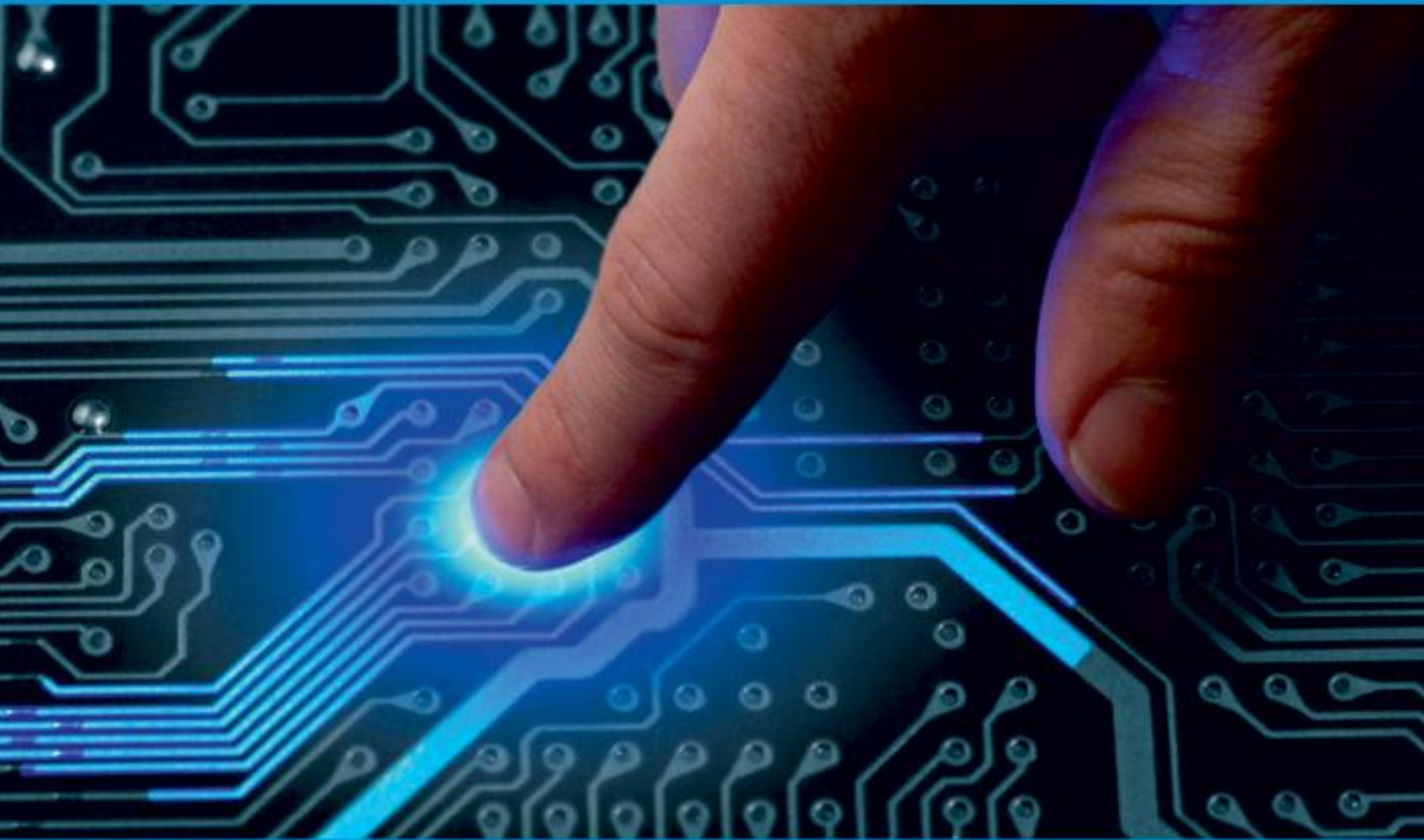

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Music Recommendation Using Facial Recognition

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ABSTRACT: Music plays an important role in our daily lives. A life without music is unthinkable. Music changes our minds; Regardless of our emotions, the only thing we can do is listen to music. We also listen to music while working, driving, traveling, or even reading comics or stories. Music can evoke a clear response in listeners. Sound and music are controlled by the areas of the brain responsible for thinking and feeling. Therefore, music plays an important role in improving our mood. The ancients said: "The face is the expression of the soul." The content of this system/project is to create a generator that directly recognizes the user's face, creates playlists and plays songs in line with the user's wishes. This model requires a camera to capture the user's face and then uses a CNN to determine the user's intent. It will recommend playlists to the user based on the user's "mood". This solves the tedious and tedious task of burning music into multiple files and helps create suitable playlists for passionate highlights. Therefore, the proposed method can be used to generate music recommendations based on the user's facial movements.

KEYWORDS: Facial expression, Mood, Music, CNN, Facial emotion gestures.

I. INTRODUCTION

Recent research shows that listening to music can change people's emotions, behavior and thoughts. In researching the motivation behind the use of music, researchers found that the connection between emotions and feelings is an important part of music. The quality of music on emotions and self awareness is important. According to research, there is a relationship between a person's emotional state and music taste [1]. Additionally, music such as music, music, music and music interact with the brain responsible for controlling thoughts and emotions [2]. Human relationships are an important part of our daily lives. It allows us to analyze human behavior, including important elements such as body language, voice, facial expressions and emotions [3]. This useful application not only identifies the user's interests, but also creates playlists that match those interests. For example, when a person is depressed, the system plays cheerful, uplifting music, and when a person is hopeful, the system provides a mix of different types of music to encourage positive thinking [4]. There are Hindi songs on the music system. It uses Hear cascade technology, which has an accuracy rate of approximately 92.10% for facial recognition and is the main technology in this field. Due to the advancement of signal processing and technology, the field of automatic mind recognition in multimedia, including music and movies, is rapidly developing. These systems have significant potential in many applications such as music entertainment and human-computer interaction. To provide a better user experience and recommendations, we propose to create a face-based recommendation.

II. LITERATURE SURVEY

"David Matsumoto" and "Hyi Sung Hwang" published an article called "Turning the Mask of Thought". We have made many discoveries that have led to important applications around the world. This article explains these two discoveries (the phenomenon of facial emotions and the existence of micro expressions) due to their importance and novelty from the point of view of psychology. This article discusses how these findings led to the development of programs that teach people to read facial expressions, and recent studies validating these trainings and documenting their results. A document called "Emotion-Based Music Player (Emotify)". Music is a great form of entertainment. With the development of technology, the focus is on increasing the quality of manual labor. There are also many traditional musical instruments that require the selection of books and arrangement of songs. Users need to create and modify playlists for every mood, and this takes time. Some music players have cool features like songs and help users by suggesting similar things.

"Deger Ayata" and "Yusuf Yuslun" published an article called "Emotion-Based Music Recommendation". Most existing beauty visualizations use collaboration or content-based visualization. However, the user's choice of

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music does not depend on historical preferences or musical content. But this also depends on the user's wishes. This paper presents an emotion-based music recognition system that learns the user's emotions from signals obtained from physical devices. Emotion Recognition from Audiovisual Materials–. Emotion recognition systems are used to identify human emotions. This article uses audiovisual data to analyze theories. This emotional intelligence can identify a person's emotional state

based on their voice and facial expressions. Audiovisual Emotion Recognition systems are designed using fusion algorithms. In this process, independent emotion recognition using speech and facial expressions was tested for the first time. Maas et al.

Focusing on movement using facial muscles, Tian et al. [8] attempted to use permanent and temporary faces to recognize Action Units (AU) created by Ekman and Friesen in 1978. With the continuous development of the technique, the use of convolutional neural networks (CNN) for emotional intelligence has become popular [9] Music can also be classified by lyrical analysis [6], [10]. Although this tokenization method is easier to use, it is not necessary for accurate classification of songs. Another obvious problem with this approach is the linguistic limitation that limits classification to a single language. Another method of music classification is to use acoustic features such as tempo, pitch, and rhythm to describe the mood of a song. This method involves extracting a set of features and using character vectors to find patterns of specific emotions [7], [21]. In this section, we examine the use of convolutional neural networks (CNN) in cognitive processing [11], [12]. CNNs are known to simulate the human brain during visual analysis.

However, given the computational needs and complexity of CNNs, it is necessary to optimize the network to be efficient. Therefore, using CNN, we create a comparison model that complements emotions in 4 moods: happy, sad, angry and neutral with 90.23% accuracy. 3: Facial expressions, gestures, body movements, speech, etc. There are many ways to assess emotions, including: Many studies have used different methods to describe and classify the physical and emotional behaviors displayed to users of the face. The face image is pre-processed and different algorithms are used for feature extraction and segmentation. In 1978, Ekman and Friesen developed Operating Units (AU) using a continuous and permanent face [1]. His studies focused on identifying the dependence of facial muscles due to changes in positive and negative emotions and expression of emotions. The facial facial coding system targets approximately 44 facial functions, detecting and evaluating their intensity.

As Ekman suggests [2], most people work with the goal of eliminating their emotions. In the paper [4], the author proposed a geometry method to recognize face. Here features, eyes, eyebrows, lip angles, etc. It is extracted based on the movement of facial landmarks that represent the position of specific points, such as Depending on changes in thought, the distance the image travels relative to the neutral state also changes. Additionally, SVM (Support Vector Machine) and RBFNN (Radial Basis Function Neural Network) are used to classify the views, and the distance vector is used as input for object classification. In the article [5], the geometry-based method using Gabor wavelet coefficients and appearance-based feature extraction are performed by a two-layer perceptron. It's easy to classify music based on lyric analysis, but it's not.

The main challenge of this approach is the language restriction that prevents the allocation of tokens belonging to a language. Alternatively, the characteristics of emotions and feelings in music can also be separated from acoustic properties such as pitch, tempo, and tempo [6]. This method aims to extract and interpret the feature vectors that lead to the features of a subject. For example, rapid behavior corresponds to the emotion of anger. Therefore, in order to recommend good music, the system needs to understand not only the user's mood but also the thoughts of the music.

III. HARDWARE AND SOFTWARE REQUIREMENT

SR.NO	Hardware	Description
1	Processor	Intel i3 or AMD
2	Speed	1.1GHz
3	Hard Disk Space	40 GB
4	RAM	8 GB

Table 1. Hardware Requirements

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SR.NO	Software	Description
1	Operating System	Windows / Linux / MacOS
2	IDE	Vs Code
3	Processor	Intel i3
4	Coding Language	Python

Table 2. Software Requirements

IV. ARCHITECTURE

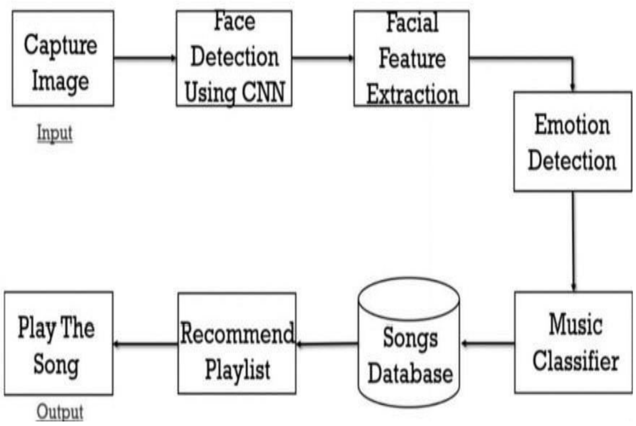

Fig. System Architecture

V. METHODOLOGY

When the system starts up, there are two options for counting items; a general option that counts all elements in the frame, and a specific option that counts only certain elements as a guide. There are two main functions:

[A] Object Detection

In the first process, instant capture is the first step. This is done using a webcam or other live camera. When we annotate images on the fly, we add metadata to the dataset. To train AI systems to recognize objects like people, each image in the database must first be carefully evaluated and processed. Image preprocessing is the process of removing data before using it to improve performance. Preprocessing is followed by feature extraction, which converts the raw data into numerical features to be processd while the data is stored in the original file.

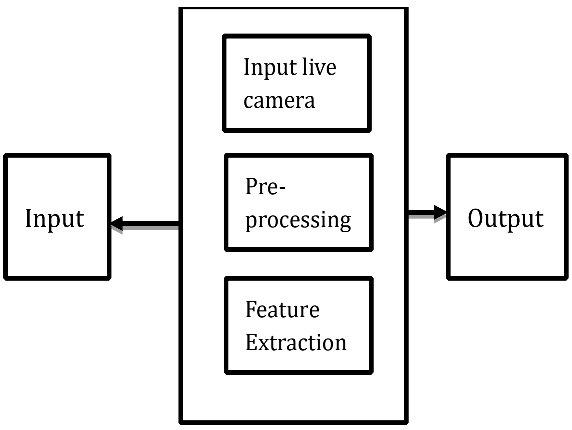

Fig. Object Detection

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[B]Counting of Object

This is done using a webcam or other live camera. When we annotate images on the fly, we add metadata to the dataset. To train AI systems to recognize objects like people, each image in the database must first be carefully evaluated and processed. Image preprocessing is the process of removing data before using it to improve performance. Preprocessing is followed by feature extraction, which converts the raw data into numerical features to be processed while the data is stored in the original

file. to multiple image segments; reduces image complexity and allows more detailed analysis of each image section. Next up is the CNN classification algorithm, which uses neural networks to provide real-time object detection. Check and count the items and display the results to the user.

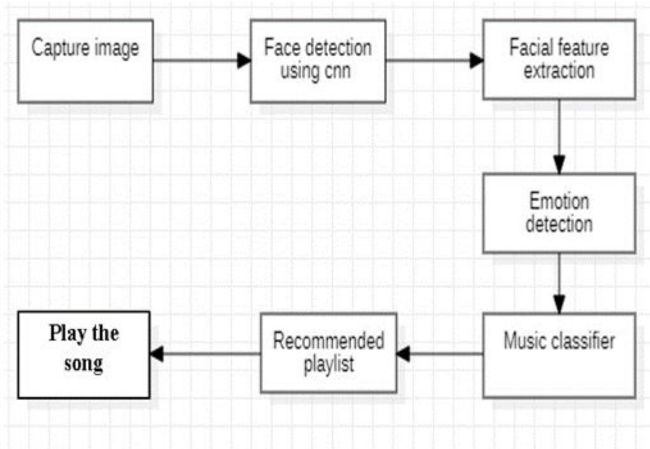

Fig. Flow of Process

VI. SUMMARY

This article describes the four methods used in the project. The table below lists the limitations of each method.

Method Used	Limitation
Generic	It cannot instantiate generic types with primitive types. It cannot create instances of type parameters.
Specific	Issues with research samples and selection. Limited access to data. Time Constraint
CNN Algorithm	Issues with research samples and selection. Limited access to data. Time Constraint

Table- Method Used In Project

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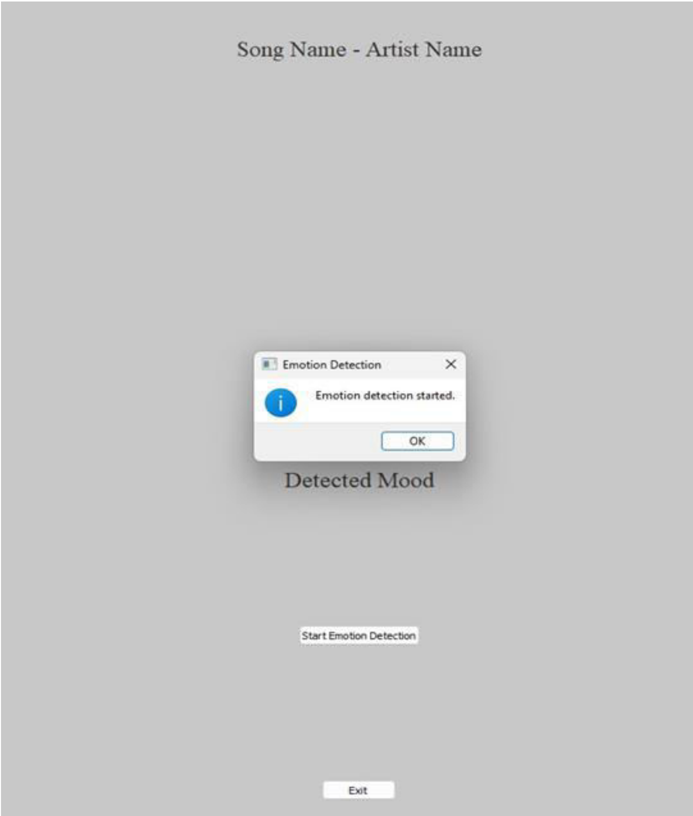
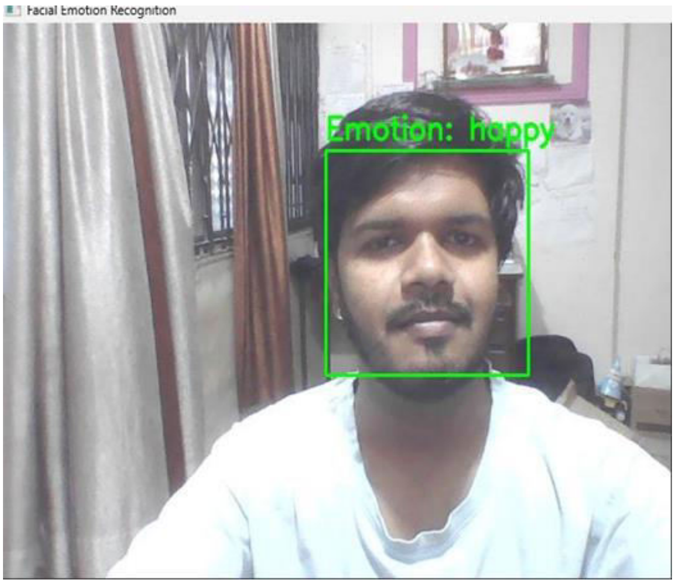
VII. RESULTS

1.Module I: Emotion Detection Prompt



2. Module II: Detecting Emotion



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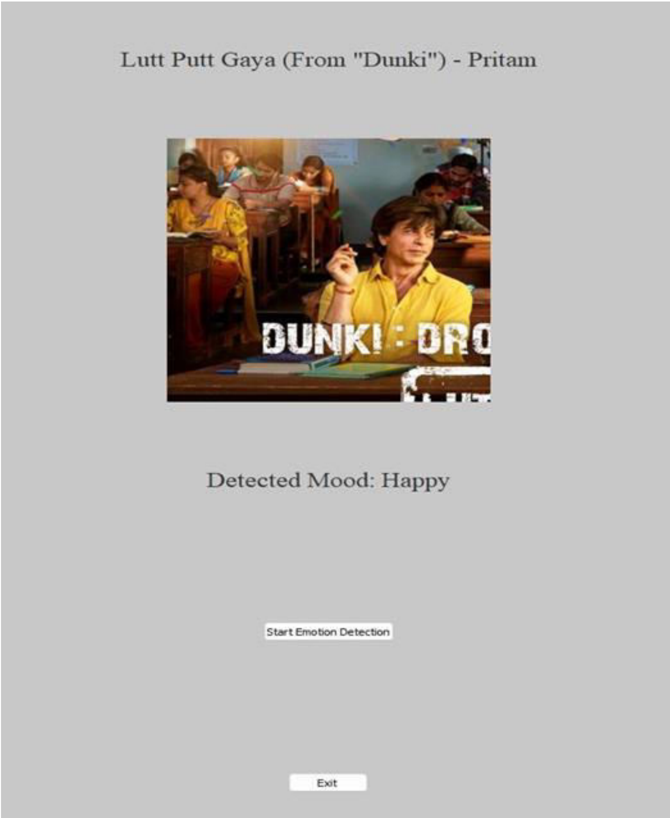
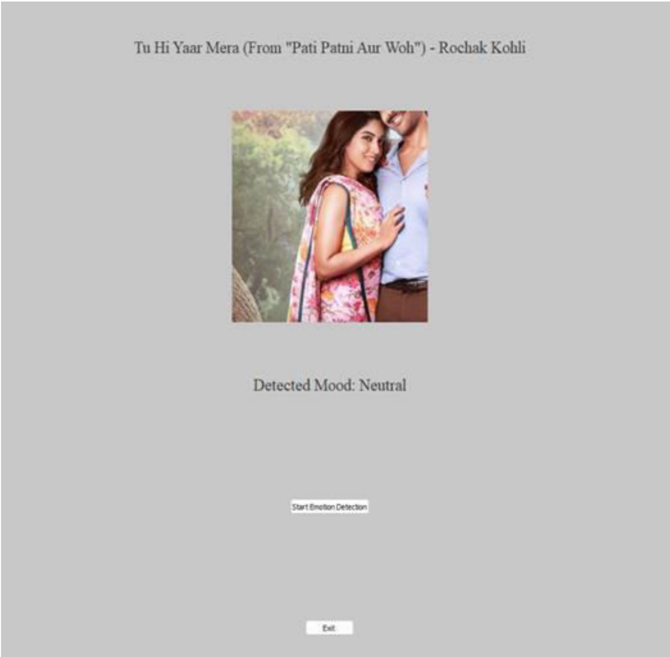
3. Module III: Detected Mood Song Recommendation



4.Neutral Mood:



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VIII. CONCLUSION

The above results are very good. The app's high accuracy and fast response time make it suitable for most purposes. The music department, in particular, is doing very well; Therefore, EMP reduces the user's workload in creating playlists. It achieved good results for the four needs studied, from good mental functioning of the user to the right music category, with an overall accuracy of 97.69%. We also recognize that there is room for improvement. It would be interesting to analyze the performance of the system when all seven aspects are taken into account. Additional songs from different languages and regions can also be added to further strengthen the recommendations. User preferences can be aggregated using collaborative filters to optimize the entire system. We plan to address these issues in our future work.

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