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# *Unique Way to Make Song Play List by Making Faces*

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***Abstract***

*Music is a reflection of one's emotions. In layman's terms, music connects to a person's emotional or mood condition. We see that new technologies and approaches emerge on a daily basis, and in order to compete, we have developed a music player that is based on the user's mood, as shown through facial expression. Emotions may be identified from a person's face, which is the simplest method for others to identify them. What if we could put this approach (emotion detection) on a machine? We created an application that detects emotion via the machine's webcam and shows a group of musicians known as a playlist based on emotion. We utilised CNN classifier for the neural network model and OpenCV to recognise faces and train the model to detect emotion in this article.*

***Keywords:*** *Smart music player, OpenCV, CNN classifier, Emotions, Software*

## INTRODUCTION

The smart music player choosing facial recognition system is primarily designed to meet the needs of the user by identifying the user's mood, and the system employs the user's facial expressions, which mostly include happy, sad, angry, and neutral emotions. As a result, the system employs the web camera as an input device to determine the user's attitude. If the user has a cheerful facial expression, the system will automatically choose a song from the database playlist, and if the user has a sad emotion, the system will identify the user's facial expression and will retrieve a song from the playlist that is appropriate for the user. If the user is in an angry mood, the system will automatically search the


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playlist for music that is suited for the user. The technology detects the user's neutral expression as the final facial detection.

So, in this study, we intend to examine existing systems and attempt to improve them by doing research on this smart music player. In the future, we hope to add capabilities like speech recognition and sensor integration to the system, resulting in a fully fleshed-out system that is strong, dependable, and long-lasting.

**Statement of the Problem**

The majority of systems employ time-consuming manual methods to pick the music.

We use a lot of memory to insert music, and the song does not meet the user's needs or mood.

Because there are so many songs on the playlist, it is difficult to find one.

The music is on the playlist, and it is impossible to tell one song from another.

**THE STUDY'S OBJECTIVES AND SCOPE**

The system's major goal is to shorten the time it takes to discover and play desired music. The system will be able to detect the user's mood and will automatically choose appropriate music from the playlist. To create cutting-edge software for the globe so that people can save time and memory space by engaging with the system.

The primary goal of the study is to develop cutting-edge software that is simple to use and meets the needs of the user by sensing the user's facial expression. As we have seen in our prior jobs, it is difficult to find a system that works as closely with the user as ours does.

In this research, we will attempt to create the greatest and most dependable software for the globe in order to tackle the difficulties indicated on the problem statement, such as wasting of memory, wastage of time, and loss of energy of the user when looking for music that is appropriate for the user.

**All users will benefit from our system.**

1. It will reduce the laborious process of creating playlists and playing songs from them.
2. A humanoid robot that reacts to human emotions.
3. Emotion-based automation.
4. Take-along music therapy.


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5. If publicly implemented at a high level/on a broad scale. The manual processing of music playlists will thereafter be reduced.

**CURRENT SYSTEMS ADVANTAGES**

1. Facial expressions and detections was accurately and effectively processed.
2. The existing system already has data saved in its database; thus, it is not necessary to recreate it.
3. It is simple to create a playlist from a database.
4. Smart music players are effective and efficient in saving the user's time and memory.

**DISADVANTAGES**

1. Facial expressions and detections was not combined in a single system.
2. Existing methods were shown to be less accurate.
3. Pre-existing systems were not reliant on offline data.
4. There were issues with music selection due to inaccuracy.

**METHODOLOGIES PROJECT METHODOLOGY**

Using the OpenCV library package and the CNN method, we can capture the user's emotion picture by image. When a user clicks on the application's camera feature and presents a cheerful smile, the system retrieves and mixes the related emotion from the dataset. This system employs an unsupervised machine learning approach, in which a dataset is supplied, and the system is taught. CNN is a feed-forward neural network used for image recognition and object categorization. RNN, on the other hand, works on the premise of preserving a layer's output and feeding it back to the input in order to forecast the layer's output. CNN examines just the current input, whereas RNN considers both the current and previously received inputs. Because of its internal memory, RNN can remember earlier inputs. CNN contains four layers: the ReLU layer, the Convolution layer, the Fully Connected Layer, and the Pooling layer. Each layer has its own functions, such as feature extraction and the discovery of hidden patterns. RNNs are classified into four types: one to one, one to many, many to one, and many to many. CNN is incapable of dealing with sequential data, but RNN is.

In our application, we manually update music with the related emotion. For example, user "x" adds the song "a" with the associated emotion cheerful. So, while utilising facial emotion recognition, if user "x" exhibits a happy expression on camera


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in the smart player, the system will take happy as a variable and display songs from the database that has the associated emotion happy. We don't have a database for this system yet. As a result, we included a tool that allows you to add music from anywhere in the system related to the corresponding emotion. In addition, each user has their own playlist in the system. We've added songs based on the variables Name, Emotion, and User.

**TensorFlow:** TensorFlow is a complete open-source machine learning platform. It features libraries, a rich, flexible ecosystem of tools, and community resources that enable academics to become comfortable with and advance in ML, as well as developers to easily construct and execute ML-powered applications. TensorFlow has various layers of abstraction, allowing you to select the best one for your purposes. Create and train models using the high-level Keras API, which makes it simple to get started with TensorFlow and machine learning. If you want additional freedom, eager execution enables instant iteration and straightforward debugging. Use the Distribution Strategy API for distributed training on diverse hardware configurations without modifying the model design for big ML training projects.

Keras: Keras is a Python-based high-level neural network API that can operate on top of TensorFlow, CNTK, or Theano. Keras is a human-centric API, not a machine-centric API. Keras adheres to best practices for decreasing cognitive load by providing consistent and straightforward APIs, minimising the number of user activities necessary for typical use cases, and providing clear and responsive feedback in the event of a user mistake.

Questionnaires were utilised to collect and acquire user information during data mining in our research, and the sample questions are included at the conclusion.

**ARCHITECTURE OF SYSTEMS**

Identifying people's emotions is a vital aspect of comprehending their situation. A smart music player that can recognise facial emotions and play or develop song playlists will be extremely useful. In our research, we demonstrated how to recognise face emotion using computer vision and the CNN (Convolutional Neural Network) method. The most significant component of this system is the facial recognition technology, which recognises the user's emotion. In this case, we combined OpenCV with CNN. OpenCV cannot be used directly, but it may be used with other frameworks like Tensorflow or


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Pytorch. In our system, we utilised Tensorflow as a framework. CNN is used to classify images. It is not trained directly but rather uses other pictures, and characteristics are extracted pixel by pixel. Here, As soon as the user launches the application, the login interface appears on the screen, where the user enters the credentials such as Email ID and password for login. If the user is new, he or she can register or create an account using their Email id, and verification is also done using the OTP process. When a person connects into his or her account, he or she may then add or remove songs based on their interests and pick an emotion for the same. The same window that the user uses to add songs is also used to display and play all of the songs, regardless of their sentiment. In brief, the user may listen to all of the songs without sensing emotion through the face. If the user wishes to listen to the chosen emotion song, he or she can utilise the facial emotion recognition feature by clicking on the camera button on the same screen as described previously.

Now, as soon as the camera is opened, the system attempts to recognise the user's emotion, and the system retrieves the emotion based on the prior dataset through which the system was taught. For training, the open-source dataset fer2013 is utilised, which contains all of the emotions. Using the CNN algorithm, a picture is categorised, and the emotion is provided as a variable to the database, where songs are pulled from the database depending on the associated emotion, and the user may listen to those songs. If the user wants to detect the emotion again, he or she can do so by clicking on the camera button on the application's graphical interface. Finally, if a user desires, he or she can log out.

## RESULTS

In this section, we attempted to demonstrate how our system works and what distinguishes it from other pre-existing systems. We have detailed all of the procedures that the user must do following the installation of our system.

We also gave screen photos to further explain what the system requires and what the user should do to engage with the system as requested.

### System authorization

Before utilising our system, the user must first log in to the system. The user will discover a login form that will allow him to establish a personal account that he/she will use before launching the system.


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**User facial recognition:** After the user logs into the system, the system will begin to engage with the user by utilising the web camera to analyse the user's mood. As previously said, we attempted to test our system using three emotions that the user may encounter in his everyday life: joy, sadness, and fury. By entering the user's photo into the system, the system will track the user's facial expression to determine the mood the user is now in.

(Sad Emotion)

((((((((((((((((((((

(Angry Expression)

**1. SongWindow at Random**

In this window, the system will choose music from the playlist at random and begin playing it automatically.

(Random Song Selection Window)

2. Choosing music from a Playlist After determining the user's mood, the system will automatically navigate to the playlist given by the system to make selections.

The system has the following framework to hold various music kinds that are appropriate for the three moods we've stated so far, so by utilising the window below, the system will begin to search through the playlist to identify and play a song that is relevant for the user at that time.

If the user wants to identify the emotion again using the camera, he or she can do so by clicking on the camera button.

(Generated Facial Expression Window)

## CONCLUSION

In this study, we attempted to investigate several types of systems and techniques to learn about the system, how it works, and how to address the shortcomings of existing systems.

As we conducted the study, we discovered that many smart players lack contact with the user, and we attempted to design a smart music player that is more convenient for the user as well as the society by utilising these shortcomings. We want to improve the system's disadvantages in the near future by introducing more features, resulting in sharp-edged software that is durable, dependable, and suited for all users. During the research and analysis, we discovered that most pre-existing systems lack interaction with the user, that their memory usage is poor, and that it was even difficult for the user to select a piece of


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music from the music playlist. As a result, the user was forced to spend more time and energy playing music that was appropriate for his mood at the time, when he was experiencing the feelings indicated on the preceding themes of the study article, which are sad, pleased, and furious. In general, our study is useful in a variety of disciplines, such as artificial intelligence for improved human connection, or we may be able to deploy this system for patients suffering from depression and autism in the near future. Aside from that, it aids in decreasing the user's physical labour in playing chosen tunes.

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