JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue

JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

SURVEY PAPER ON MUSIC PREDICTION AND THERAPY USING RANDOM FOREST

Amit Chowdary Kamma [1] , K M Impana [2], Madhan N [3], Mismitha S [4] , Prof Sharmila Chidaravalli [5]

1,2,3,4 - Undergraduate Information Science and Engineering students at Global Academy of Technology, Rajarajeshwarinagar, Bangalore – 560098

5-Assistant Professor in Department of Information Science and Engineering at Global *Academy of Technology*, Rajarajeshwarinagar, Banaglore-560098

Abstract: Humans use their facial expressions as one means of expressing their emotions, which is a strong tool in communication. Recognizing facial expressions is one of the difficult and effective jobs in social communication since facial expressions are crucial in non-verbal communication. In order to explain and comprehend human emotions, songs have always been a popular alternative. The expression of an individual's emotion can be seen in their eyes, cheeks, forehead, or even in the curve of their smile, among other facial features. Music is a sort of art that calms and soothes the human body and brain. Taking these two ideas and combining them, this project focuses on identifying an individual's emotion through their facial expression and playing music that will help them feel better or just calm down. It can also provide faster song selection based on their mood, saving time from searching through various songs, while simultaneously developing software that can be used anywhere with the functionality of playing music according to their mood. This study has the random forest algorithm which is a supervised machine learning. The result found are promising to have an accuracy of more than 89%.

Index Terms **– Random forest algorithm, Feature extraction, Machine learning, Music therapy.**

INTRODUCTION

Since ancient times, music has been utilized for therapeutic purposes. Regarding its functional mode, there have been numerous theories developed over the ages, including prehistoric theories, the idea of creating tissue vibrations, and more recently, the idea of interfering with organisms' physiological functioning. During World War II, music therapy began to have a scientific foundation, and the phrase "music therapy" was first used in about 1950. Modern music therapy is employed in many medical specialties, as well as in special education and mental health care. When used in conjunction with other forms of art therapy, psychotherapy, and physiotherapy as part of a complex treatment regimen that calls for the tight collaboration of therapists, doctors, and psychologists, it compliments medication.

While evaluating patients, music therapists typically employ qualitative methods of assessment, which makes it difficult to detect cognitive impairment and determine whether the therapy is appropriate. For diagnosis and the creation of treatment programs, thorough assessment is crucial, and in clinical practice music therapists are regularly requested to describe the validity and reliability of their methods. The assessment of a patient is essential in developing MT treatments, even though diagnosis is not a part of the music therapist's job description. This is because it establishes the patient's baseline cognitive functioning, enables the creation of appropriate therapeutic goals, and allows for the evaluation of intervention effectiveness.

Since digital music libraries have exploded in popularity in recent years, practically everyone can now listen to music. Using their smart phones, tablets, smart TVs, etc., more and more individuals today have simple access to digital musical content either at home or while travelling. Users of platforms like Spotify and Pandora have access to a plethora of musical content that can be browsed and categorized according to genre, ethnicity, time period, emotion, etc. Therefore, there is an urgent need to create automated systems that will aid in the search, arrangement, and classification of musical content and related information. Many fields, including

auditory perception, psychology, and theory of relativity, as well as the signal processing field, pattern recognition, and machine learning, are involved in identifying emotions in songs.

LITERATURE SURVEY

Paper [1] recognizes musical emotions is the major goal of this work. In this study, logistic regression and the random forest method are used to model musical emotions. The findings demonstrate that logistic regression is superior to random forest approaches for recognition. Mel-Frequency Cepstral Coefficients (MFCC), logistic regression, and the random forest algorithm were the approaches used in this work. Applying emotion prediction to a music information retrieval system is part of the future development.

In paper [2], the model is based on real-time facial expression extraction to determine mood. In this work, the researchers extracted facial features using the Fisherfaces method, identified user emotions using the Cohn-Kanade dataset, and predicted emotions using the random forest algorithm. This music therapy application's standout feature is that it automatically plays music and offers a way to retrain the trained model in order to further enhance its performance.

In paper [3] the methodology is involved in identifying a multimodal mood from the song's audio and lyrics. Using a database of 18,000 songs tagged with a continuous arousal/valence representation, deep learning approaches have been used to tackle the issue and compare the methodology to classical feature engineering-based ones. In terms of arousal detection, the results showed that deep learning models outperform conventional methods, while both methods perform similarly in terms of valence detection. Labeling the degree of ambiguity in a track's mood could also be a focus of future investigation.

The goal of the study in paper [4] is to improve user mental health by developing "Viby," an extensive mood-based music recommendation system. By recognizing the users' emotions, this application uses machine learning and natural language processing techniques to make music therapy accessible. The users received appropriate and beneficial music recommendations from Viby. Future study must also take into account additional factors such users' auditory characteristics, vocally expressed emotions, pulse rate, body temperature, and blood pressure.

In paper [5], the application will take a picture of a person's face, which is then further scanned, after which image processing is used to determine the person's mood in order to display the music that will be played. Here, a music player is made using OpenCV. By automatically generating music based on the user's mood, this method saves the user time. It also eliminates the need to search for songs and avoids any confusion caused by having to select songs before listening to them. Future objectives for this system include implementing it to scale out to different users and make the system as a whole and the entire process of detecting mood more effective and smooth.

Paper [6] discusses the behavior of significant people towards one another during music therapy and routine social interaction were compared in this study. For dementia patients living at home, this study compared individually tailored music therapy to routine social interaction. The short-term well-being of the care receivers was positively impacted by individually designed music therapy. More research is necessary to determine whether music therapy has the ability to improve caregiver-related behavioral patterns. The behaviors seen in the single-case design are thought to be pertinent for dementia patients. After the conclusion of the treatment, neither a rise in long-term wellbeing nor a reduction in caretaker stress was observed.

According to paper [7], SVM-ANN hybrid classifier performance is significantly superior to that of other machine learning techniques. The major goal of this study is to forecast the type of music that will be used in music therapy with consideration for the patient's needs and therapeutic goals. It also compares several machine learning algorithms. This study focuses on the significance of music therapy and its positive impacts on both physical and mental health. After the prediction through automation, the research can be further improved by playing audio files with music for therapy.

The research made in paper [8] suggests a multimodal convolutional neural network as a solution to the issue of multi-modal feature extraction and feature fusion. It is used to the goal of determining the impact of music genres on children's emotions and increases the prediction accuracy of sentiment analysis. The BiLSTM neural network is used in this paper's first step to extract features from audio and video. In parallel, text features are extracted using the BERT neural network. In addition, this study suggests an enhanced transformer convolutional neural network, which is integrated to the multimodal feature information fusion module and effectively fuses multimodal feature information. Lastly, multi-modal feature data is used to assess children's emotional states.

The implementation of Convolutional neural network in paper [9] has helped in the detection of emotions by which a particular and appropriate song would be played based on the emotion expressed which depends on an individual's mood. CNN is a deep learning algorithm that can take an image as the input. This algorithm helps to obtain and implement minimal processing and multilayer Perceptron. Back propagation process is used as a training procedure to activate the filters for increased visualization. In a single step, various actions such as capturing, determining, and classifying the expressed emotions can be achieved with the use of CNN, thereby increasing the processing speed which in turn results in increased accuracy. The emotions which are apprehend by the model is based off the accuracy. The Emotion based music player helps to assist physically challenged people to have a realistic user experience and their fundamental motive was to maintain or change an individual emotional state an individual with the help of music.

The study investigated in paper [10] discusses the development of a model to identify emotion in Filipino music. Paul Ekman's six fundamental emotions served as the basis for the utilized emotion model. The songs were divided into the kundiman, novelty, pop, and rock genres. jAudio was used to extract the songs' musical features, while Bag-of-Words feature representation was used to extract the songs' lyric features. The three classifiers Nave Bayes, Support Vector Machines, and k-Nearest Neighbors were chosen to classify the audio and lyric aspects of the Filipino songs. 100 songs from the Philippines were used in the study. The 25 tracks include the kundiman, novelty, pop, and rock genres, respectively. The phases of processing include feature extraction, model building, model analysis, and model testing. Audacity, jAudio, Lightside, and WEKA were the instruments employed in this investigation. Overall, the study was able to develop models utilizing songs as a dataset using audio, lyrics, or combined audio and lyrics feature sets with the maximum accuracy ranging from 52 to 69%. Given the short dataset that the researchers employed, Naive Bayes and K-Nearest Neighbor were better suitable as classification algorithms in this study.

In paper [11], using CNN's audio benefits and features, the authors of this study created a music genre categorization model to help consumers find different sorts of music faster. Librosa is used to transform the original audio files into Mel spectrums during the pre-processing. In order to train the recommended CNN model, the Mel spectrum is processed and given. A majority vote is used to determine the 10 classifiers' classifications on the GTZAN dataset, with an average accuracy of 84 percent. Neural network (NN)-based music genre classification has shown some modest success in recent years. This study reviews several machine learning techniques applied in this field. Moreover, research on musical genre classification is involved. Images of spectrograms created from time slices of tracks and fed into a neural network are used to classify songs into various musical genres (NN). As a consequence, this method seems promising for assigning the proper genre to a large collection of music. A convolutional neural network using mel-spectrograms of three-second audio samples was found to be the most effective combination after testing with a variety of datasets, pre-processing techniques, neural network architectures, and other parameters.

The literature in paper [12] demonstrates the therapeutic benefits of music listening, but it is still unclear what elements, what kinds of music, and how music therapists should choose music cause these effects. Here, we offer a study that uses machine learning techniques to identify the key predictors of the relaxing benefits of listening to music. Age, education level, musical training, and sex were all distributed equally among the 350 healthy participants. They each took a nine-minute break to listen to music (either to their preferred music or to algorithmically generated music). A visual analogue scale (VAS) was used to measure the subjects' degrees of relaxation both before and after the listening session. The individuals were subsequently split into three groups based on whether their level of relaxation had increased, decreased, or remained constant. To forecast how listening to music will affect relaxation, a decision tree was created. A decision tree was created with an overall accuracy of 0.79. The decision tree's structure was analyzed to draw some conclusions about the most crucial variables that predict the impact of listening to music, including beginning levels of relaxation, the combination of education and musical training, age, and frequency of listening. Finding predictive elements that affect the results of therapeutic music listening is made feasible by the decision tree that results from the examination of this interpretable model. Because therapeutic music listening is so subjective, using machine learning techniques to help music therapy practice is a crucial and cutting-edge idea.

In paper [13], designing signal-based descriptors that represent emotions is quite challenging. This study proposes a deep learning network and conducts experiments using the benchmark datasets Soundtracks, Bi-Modal, and MER Taffc. Every piece of music is connected to an emotion, and as a result, it gives the listener an intuitive feeling. Research on identifying the underlying emotions in music is ongoing. Despite the use of sophisticated tools, it can be difficult to identify the emotional category of musical snippets. This is primarily caused by how subjective emotion is. The use of handcrafted features has been tested. Moreover, features based on the LPCC and MFCC standards are included since they correspond to the qualities of vocal production and human perception, respectively. For many benchmark datasets, the combined feature set offers

a reasonable outcome, however classifier performance varies. They struggle to categorize photos with various positions. The drawbacks of the proposed method include the fact that a large amount of training data is required for the CNN to be efficient and that the position and orientation of objects are not encoded. The position and orientation of objects are not encoded.

Paper [14] discusses the field of artificial intelligence, facial expression recognition (FER) is a hot topic of research that has applications in a wide range of industries, including marketing, entertainment, e-learning, medical, security, law enforcement, and social humanoid robots. Automatic facial expression recognition is useful in many disciplines, including data analytics, psychological research, social gaming, and others that involve human-computer interactions. This study, shows how to classify FER utilizing CNNs and static images without performing any feature extraction or pre-processing work. The most noticeable features of the face, including the jaw, lips, eyes, nose, and brows, are extracted via feature extraction. In a seven-class classification challenge using FER2013, the test accuracy was reached at 61.7% as opposed to 75.2% using state-of-the-art classification. The optimum network design can be difficult to find in deep learning. It is found CNNs use a heuristic technique and will continue to search for a more robust network in the future. To increase accuracy, we will also use pre-processing and feature extraction methods that were covered in the technical work part. Also, because the training dataset had a 99.64% accuracy rate, it encountered an overfitting problem. Data augmentation is therefore an essential stage in deep FER. Normally, a deep learning toolset includes data augmentation to address the overfitting problem. With the hope of approaching the current state-of-the-art.

In paper [15], the study suggests an emotion recognition algorithm for mood-based music recommendations. In order to apply to real-world scenarios, this effort strives to attain the best accuracy while maintaining the real-time component. This study examined a number of models that were constructed in various ways, including plain CNNs and pre-trained networks based on ResNet50, SenNet50, and VGG16. The GAP model, which reduced the number of parameters by over 80% while maintaining an accuracy of 66.54%, was one model that stood out. This was a breakthrough since a model this lightweight is simple to mount on compact devices, increasing the applicability to real-world applications. This study used class weighting and data augmentation to further resolve the difficult class imbalance problem of the FER2013 dataset.

LITERATURE SUMMARY

SL.No	Citation	Year	Methodology/Algorithm used	Remarks
1	G Jawaharlalnehru, S Jyotilakshmi. "Music Emotion Classification Using Logistic Regression and Random Forest."	2019	In this study, logistic regression and the random forest method are used to model musical emotions. The findings demonstrate that logistic regression is superior to random forest approaches for recognition. Mel-Frequency Cepstral Coefficients (MFCC), logistic regression, and the random forest algorithm were the approaches used in this work.	Applying emotion prediction to a music information retrieval system is part of the future development.
2	Nasam Ranjith, Puli.Navya, Rajeshwari Ravikumar, A.Kiran Kumar. "Music Prediction and Therapy Using Random Forest."	2021	This model is based on real-time facial expression extraction to determine mood. In this work, the researchers extracted facial features using the Fisherfaces method, identified user emotions using the Cohn-Kanade dataset, and predicted	This study offers a way to retrain the trained model in order to further enhance its performance.

			emotions using the random forest algorithm.	
3	Remi Delbouys, Romain Hennequin, Francesco Piccoli, Jimena Royo-Letelier, Manuel Moussallam. "Music Mood Detection Based On Audio and Lyrics With Deep Neural Net."	2018	This study's methodology involved identifying a multimodal mood from the song's audio and lyrics. Using a database of 18,000 songs tagged with a continuous arousal/valence representation, deep learning approaches have been used to tackle the issue and compare the methodology to classical feature engineering-based ones. In terms of arousal detection, the results showed that deep learning models outperform conventional methods, while both methods perform similarly in terms of valence detection.	Labelling the degree of ambiguity in a track's mood could also be a focus of future investigation.
4	Sanjana Shivananda, Rithik Dutt, Bhuvanesh Perumal, Anagha H, Prof.Latha AP. "Mood-Based Music Recommendation System-VIBY."	2022	The goal of this study is to improve user mental health by developing "Viby," an extensive mood-based music recommendation system. By recognising the users' emotions, this application uses machine learning and natural language processing techniques to make music therapy accessible. The users received appropriate and beneficial music recommendations from Viby.	Future study must also take into account additional factors such users' auditory characteristics, vocally expressed emotions, pulse rate, body temperature, and blood pressure.
5	Meena Talele, Yash Gurnani, Hirday Rochani, Manish Patil, Kapil Soneja. "Smart Music Player Using Mood Detection."	2022	In this study, the application will take a picture of a person's face, which is then further scanned, after which image processing is used to determine the person's mood in order to display the music that will be played. Here, a music player is made using OpenCV. By automatically generating music based on the user's mood, this method saves the user time. It also eliminates the need to search for songs and avoids any confusion caused by having to select songs before listening to them.	Future objectives for this system include implementing it to scale out to different users and make the system as a whole and the entire process of detecting mood more effective and smooth.

6	Kristine Gustavsen Madso, Helge Molde, Kia Minna Hynninen, Inger Hilde Nordhus. "Observing Music Therapy in Dementia: Repeated Single-case Studies Assessing Well-being and Sociable Interaction."	2022	The behaviour of significant people towards one another during music therapy and routine social interaction were compared in this study. For dementia patients living at home, this study compared individually tailored music therapy to routine social interaction. The short-term well-being of the care receivers was positively impacted by individually designed music therapy.	More research is necessary to determine whether music therapy has the ability to improve caregiver-related behavioural patterns. The behaviours seen in the single-case design are thought to be pertinent for dementia patients. After the conclusion of the treatment, neither a rise in long-term wellbeing nor a reduction in caretaker stress was observed.
7	K Devendran, S K Thangarasu, P Keerthika, R Manjula Devi, B K Ponnarasee. "Effective Prediction on Music Therapy Using Hybrid SVM-ANN Approach."	2021	According to this study, SVM-ANN hybrid classifier performance is significantly superior to that of other machine learning techniques. The major goal of this study is to forecast the type of music that will be used in music therapy with consideration for the patient's needs and therapeutic goals. It also compares several machine learning algorithms. This study focuses on the significance of music therapy and its positive impacts on both physical and mental health.	After the prediction through automation, the research can be further improved by playing audio files with music for therapy.
8	Qingfang Qian, Xiaofeng Chen. "A Multi-Modal Convolutional Neural Network Model for Intelligent Analysis of the Influence of Music Genres on Children's Emotions."	2022	This research suggests a multimodal convolutional neural network as a solution to the issue of multi-modal feature extraction and feature fusion. It is used to the goal of determining the impact of music genres on children's emotions and increases the prediction accuracy of sentiment analysis. The BiLSTM neural network is used in this paper's first step to extract features from audio and video. In parallel, text features are extracted using the BERT neural network. In addition, this study suggests an enhanced transformer convolutional neural	As a result, multi-modal feature data is used to assess children's emotional states.

			network, which is integrated to the multimodal feature information fusion module and effectively fuses multimodal feature information.	
9	S. Deebika, K.A.Indira, Dr.Jesline. "A Machine Learning Based Music Player by Detecting Emotions."	2019	The implementation of Convolutional neural network has helped in the detection of emotions by which a particular and appropriate song would be played based on the emotion expressed which depends on an individual's mood. CNN is a deep learning algorithm that can take an image as the input. This algorithm helps to obtain and implement minimal processing and multilayer Perceptron. Back propagation process is used as a training procedure to activate the filters for increased visualization. In a single step, various actions such as capturing, determining, and classifying the expressed emotions can be achieved with the use of CNN, thereby increasing the processing speed which in turn results in increased accuracy.	The Emotion based music player helps to assist physically challenged people to have a realistic user experience and their fundamental motive was to maintain or change an individual emotional state an individual with the help of music.
10	Kathleen Alexis Noblejas, Daryl Arvin Isidro, Mary Jane C. Samonte. "Emotion Detection Model of Fillipino Music."	2017	This study investigated the development of a model to identify emotion in Filipino music. Paul Ekman's six fundamental emotions served as the basis for the utilised emotion model. The songs were divided into the kundiman, novelty, pop, and rock genres. jAudio was used to extract the songs' musical features, while Bag-of-Words feature representation was used to extract the songs' lyric features. The three classifiers Nave Bayes, Support Vector Machines, and k-Nearest Neighbors were chosen to classify the audio and lyric aspects of the Filipino songs. 100 songs from the Philippines were used in the study. The 25	Overall, the study was able to develop models utilising songs as a dataset using audio, lyrics, or combined audio and lyrics feature sets with the maximum accuracy ranging from 52 to 69%. Given the short dataset that the researchers employed, Naive Bayes and K-Nearest Neighbor were better suitable as classification algorithms in this study.

			tracks include the kundiman, novelty, pop, and rock genres, respectively. The phases of processing include feature extraction, model building, model analysis, and model testing. Audacity, jAudio, Lightside, and WEKA were the instruments employed in this investigation.	
11	Meet Raval, Parv Dave, Raj Dttani. "Music Genre Classification Using Neural Networks."	2021	Using CNN's audio benefits and features, the authors of this study created a music genre categorization model to help consumers find different sorts of music faster. Librosa is used to transform the original audio files into Mel spectrums during the pre-processing. In order to train the recommended CNN model, the Mel spectrum is processed and given. A majority vote is used to determine the 10 classifiers' classifications on the GTZAN dataset, with an average accuracy of 84 percent. Neural network (NN)-based music genre classification has shown some modest success in recent years. Moreover, research on musical genre classification is involved. Songs are categorized into several musical genres using time slices of songs used to create spectrogram images that are then fed into a neural network (NN). As a result, this method seems promising for assigning the proper genre to a big collection of music.	A convolutional neural network using mel-spectrograms of three-second audio samples was found to be the most effective combination after testing with a variety of datasets, pre-processing techniques, neural network architectures, and other parameters. The application of emotion recognition in business streams will increase. It can be used to determine whether a user is drowsy while they are driving. The best users of this to hear tunes are physically disabled folks.
12	Alfredo Raglio, Marcello Imbriani, Chiara Imbriani, Paola Baiardi, Sara Manzoni, Marta Gianotti, Mauro Castelli, Leonardo Vanneschi, Francisco Vico, Luca Manzoni. "Machine Learning	2022	The literature demonstrates the therapeutic benefits of music listening, but it is still unclear what elements, what kinds of music, and how music therapists should choose music cause these effects. Here, we offer a study that uses machine	Finding predictive elements that affect the results of therapeutic music listening is made feasible by the decision tree that results from the examination of this interpretable model. Because therapeutic music

	Techniques To Predict The Effectiveness Of Music Therapy: A randomized Controlled Trial.”		learning techniques to identify the key predictors of the relaxing benefits of listening to music. Age, education level, musical training, and sex were all distributed equally among the 350 healthy participants. They each took a nine-minute break to listen to music (either to their preferred music or to algorithmically generated music). A visual analogue scale (VAS) was used to measure the subjects' degrees of relaxation both before and after the listening session. The individuals were subsequently split into three groups based on whether their level of relaxation had increased, decreased, or remained constant.To forecast how listening to music will affect relaxation, a decision tree was created. A decision tree was created with an overall accuracy of 0.79. The decision tree's structure was analysed to draw some conclusions about the most crucial variables that predict the impact of listening to music, including beginning levels of relaxation, the combination of education and musical training, age, and frequency of listening.	listening is so subjective, using machine learning techniques to help music therapy practise is a crucial and cutting-edge idea.
13	Rajib Sarkar, Sombuddha Choudhury, Saikat Dutta, Aneek Roy, Sanjoy Kumar Saha. "Recognition of emotion in music based on deep convolutional neural network."	2019	Designing signal-based descriptors that represent emotions is quite challenging. This study proposes a deep learning network and conducts experiments using the benchmark datasets Soundtracks, Bi-Modal, and MER Taffc. Every piece of music is connected to an emotion, and as a result, it gives the listener an intuitive feeling. Research on identifying the underlying emotions in music is ongoing. Despite the use of sophisticated tools, it can be	The drawbacks of the proposed method include the fact that a large amount of training data is required for the CNN to be efficient and that the position and orientation of objects are not encoded. The position and orientation of objects are not encoded.

			difficult to identify the emotional category of musical snippets. This is primarily caused by how subjective emotion is. The use of handcrafted features has been tested. Moreover, features based on the LPCC and MFCC standards are included since they correspond to the qualities of vocal production and human perception, respectively. For many benchmark datasets, the combined feature set offers a reasonable outcome, however classifier performance varies. They struggle to categorize photos with various positions.	
14	Shekhar Singh, Fatma Nasoz. "Facial Expression Recognition with Convolutional Neural Networks."	2020	In the field of artificial intelligence, facial expression recognition (FER) is a hot topic of research that has applications in a wide range of industries, including marketing, entertainment, e-learning, medical, security, law enforcement, and social humanoid robots. Automatic facial expression recognition is useful in many disciplines, including data analytics, psychological research, social gaming, and others that involve human-computer interactions.	This study, shows how to classify FER utilising CNNs and static images without performing any feature extraction or pre-processing work. The most noticeable features of the face, including the jaw, lips, eyes, nose, and brows, are extracted via feature extraction. In a seven-class classification challenge using FER2013, the test accuracy was reached at 61.7% as opposed to 75.2% using state-of-the-art classification.
15	Sulaiman Muhammad, Safeer Ahmed, Dinesh Naik " Real Time Emotion Based Music Player Using CNN Architectures."	2021	This study suggests an emotion recognition algorithm for mood-based music recommendations. In order to apply to real-world scenarios, this effort strives to attain the best accuracy while maintaining the real-time component. This study examined a number of models that were constructed in various ways, including plain CNNs and pre-trained networks based on ResNet50, SenNet50, and VGG16. The GAP model, which reduced the number of parameters by	Future research could use landmark detection methods to remove pointless face characteristics from the image during training, increasing the accuracy of this model even more. By using a multi-label classification technique, this may be able to handle photos with various classes of emotion better.

			over 80% while maintaining an accuracy of 66.54%, was one model that stood out. This was a breakthrough since a model this lightweight is simple to mount on compact devices, increasing the applicability to real-world applications.	

CONCLUSION

In conclusion, to automate and provide a better music player experience for the user, the Emotion-Based Music Player is used. It uses a camera to capture the user's face image, analyses their emotion, and then suggests a personalized play list using a more sophisticated and interactive approach.
Through literature survey, we have noticed that emotion prediction is more accurate with the use of random forest model than convolutional neural network (CNN). An- other methodology which was discussed in the literature review was discrete wavelet transforms and CNN, in this paper, it describes the real time EEG-ER can also be useful to diagnose mental or mood disorders but the disadvantage for the model is that it is a time consumption training process.
Overall, Random Forest is a powerful and flexible tool for music prediction and therapy that can be used to improve the effectiveness of music-related interventions and treatments.

REFERENCES

[1] G Jawaharlalnehru, S Jyotilakshmi. “Music Emotion Classification Using Logistic Regression and Random Forest”.

[2] Nasam Ranjith, Puli.Navya, Rajeshwari Ravikumar, A.Kiran Kumar. “Music Prediction and Therapy Using Random Forest”.

[3] Remi Delbouys, Romain Hennequin, Francesco Piccoli, Jimena Royo-Letelier, Manuel Moussallam. “Music Mood Detection Based On Audio and Lyrics With Deep Neural Net”.

[4] Sanjana Shivananda, Rithik Dutt, Bhuvanesh Perumal, Anagha H, Prof.Latha AP. “Mood-Based Music Recommendation System-VIBY”.

[5] Meena Talele, Yash Gurnani, Hirday Rochani, Manish Patil, Kapil Soneja. “Smart Music Player Using Mood Detection”.

[6] Kristine Gustavsen Madso, Helge Molde, Kia Minna Hynninen, Inger Hilde Nordhus. “Observing Music Therapy in Dementia: Repeated Single-case Studies Assessing Well-being and Sociable Interaction”.

[7] K Devendran, S K Thangarasu, P Keerthika, R Manjula Devi, B K Ponnarasee. “Effective Prediction on Music Therapy Using Hybrid SVM-ANN Approach”.

[8] Qingfang Qian, Xiaofeng Chen. “A Multi-Modal Convolutional Neural Network Model for Intelligent Analysis of the Influence of Music Genres on Children’s Emotions”

[9] S. Deebika, K.A.Indira, Dr.Jesline. “A Machine Learning Based Music Player by Detecting Emotions”.

[10] Kathleen Alexis Noblejas, Daryl Arvin Isidro, Mary Jane C. Samonte. “Emotion Detection Model of Fillipino Music”.

[11] Meet Raval, Parv Dave, Raj Dttani. “Music Genre Classification Using Neural Networks”.

[12] Alfredo Raglio, Marcello Imbriani, Chiara Imbriani, Paola Baiardi, Sara Manzoni, Marta Gianotti, Mauro Castelli, Leonardo Vanneschi, Francisco Vico, Luca Manzoni. “Machine Learning Techniques To Predict The Effectiveness Of Music Therapy: A randomized Controlled Trial.”

[13] Rajib Sarkar, Sombuddha Choudhury, Saikat Dutta, Aneek Roy, Sanjoy Kumar Saha. "Recognition of emotion in music based on deep convolutional neural network."

[14] Shekhar Singh, Fatma Nasoz. “Facial Expression Recognition with Convolutional Neural Networks.”

[15] Sulaiman Muhammad, Safeer Ahmed, Dinesh Naik " Real Time Emotion Based Music Player Using CNN Architectures."