MOOD BASED PODCAST SUGGESTION SYSTEM USING CNN ARCHITECTURES

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Abstract: The music choice of a user is not only dependent on historical preferences or music contents but also dependent on the mood of that user. In this paper, we present an effective music recommendation system, which recommends music based on the real-time mood of the user. It mainly focuses on Convolutional Neural Network (CNN) model which is based on Mobile Net architecture that classifies 7 different human facial emotions. Our system consists of three modules: Emotion Module, Music Classification Module and the Recommendation Module. The Music Classification Module makes use of audio features to achieve a remarkable result of 98% while classifying songs into 4 different mood classes.

1. INTRODUCTION

Our system consists of three modules: Emotion Module, Music Classification Module and Recommendation Module. The Emotion Module takes an image of the user's face as an input and makes use of CNN to identify their present mood. The Music Classification Module makes use of audio features to achieve a remarkable result of 98% while classifying songs into 4 different mood classes. The Recommendation Module suggests songs to the user by mapping their emotions to the mood type of the song, taking into consideration the preferences of the user. Here the model is trained, tested and validated using the manually collected image dataset with an accuracy of 98%.

2. LITERATURE SURVEY

Emotions are the bodily feelings associated with mood, temperament, personality or character. Paul Ekman had developed the classifications of basic emotions which are anger, disgust, fear, happiness, sadness and surprise.

A facial expression can be expressed through the motions or from one or more motions, movements or even positions of the muscles of the face. Facial expression can be adopted as voluntary action as individual can control his facial expression and to show the facial expression according to his will. However, since facial expression is closely associated with the emotion, thus it is mostly an involuntary action. An individual may show his expression in first few micro-second before resume to a neutral expression. Facial expression analysis includes both detection and interpretation of facial motion and recognition of expression. The three approaches which enabled the automatic facial expression analysis includes i) face acquisition, ii) facial data extraction and representation, and iii) facial expression recognition

The challenge in choosing songs, particularly those that reflect people's present feelings, is what music enthusiasts are currently confronting. People will become even less inclined to search for the songs they want to listen to when they see the lengthy lists of unsorted music. As an illustration, an unhappy individual might listen to hard rock music to help them feel better. The person preferred to randomly select

songs or simply press "play all" to play every song he owned.

Additionally, this conventional method of searching for and choosing songs gets boring quickly. The technique had been used for a few years.

The investigation of various expression detection methods is part of the project's scope of inquiry. As image processing technology advanced, more and more professionals proposed various methods for processing and emotion recognition. All of these methods are crucial to this project and useful. The second goal is to learn more about the technologies that will be useful for detecting facial expressions when developing the project's suggested model. To determine which tools are the most appropriate and practical, many tools are examined for their viability and usability.

2. LITERATURE REVIEW

Barbara Raskauskas made reference to "The silence is filled by music, and it can mask the noise. Culture can be communicated through music.

Whether a song contains words or not, music is enjoyable and has the power to move us. I've never met a person who didn't enjoy music in some way. Even a deaf acquaintance of mine admitted that she enjoyed music and that she could feel the vibration it produced. The appreciation of music is shared by all people "

According to new research, people are pulled to music in much the same way that they are to sex, drugs, gambling, and excellent cuisine, according to Emily Sohn. When people hear harmony or melody that touches an emotional chord, research has shown that the human brain will release dopamine, a type of neurotransmitter produced by the body that involves addiction and motivation.

Mary Duenwald had posted a piece of writing which the facial expressions throughout the globe fall more or less into seven categories: i. Sadness: The eyelids stoop even as the inner corners of the brows upward push. ii. Surprise: Both the higher eyelids and brows upward push, and the jaw drops open. iii. Anger: Both the decrease and higher eyelids squeeze in draw collectively. The jaw pushes ahead even as lip pressed on every other. iv.Contempt: The expression seems on one facet of a face: One 1/2 of of the higher lip tightens upward. v. Disgust: The individual's nostril

wrinkles and the higher lip upward push even as the decrease lip protrudes. vi. Fear: The eyes widen and the higher lids upward push. The brows draw collectively even as the lips expand horizontally. vii. Happiness: The corners of the lips lifted and formed a smile, the cheeks upward push up and the out of doors corners of the brows pull down.

Face capabilities detection inclusive of the mouth and the eyes is continually one of the key troubles in facial picture processing because it entails huge and diverse regions such because the emotion popularity and face identification. Joseph C. Hager said that face detection characteristic is used as one of the enter to different picture processing features inclusive of the face and emotion detection. Different researchers had research at the different methods in facial features detection. Each technique may be carried out successfully in different situation

Many researchers had did studies and research on if the tune can genuinely affect the emotion of individuals. For an example, Antoinette L. Bouhuys, Gerda M. Bloem, Ton G.G.Groothuis executed a have a look at withinside the dating among the individuals' facial features after listening to despair tune. The outcomes confirmed that depressing tune bring forth a primary boom of depressed mood and great decline if extremely joyful mood. The have a look at proved that tune can genuinely affect individuals' emotions.

3. METHODOLOGY

Numerous study efforts regarding the project background and related works are carried out through available resources which are accessible personally or from the Information Resource Centre (IRC). Sources involved are books, papers, journals, thesis reports, online source and etc. The data gathered consists of current status of image processing, application of image processing and facial detection.
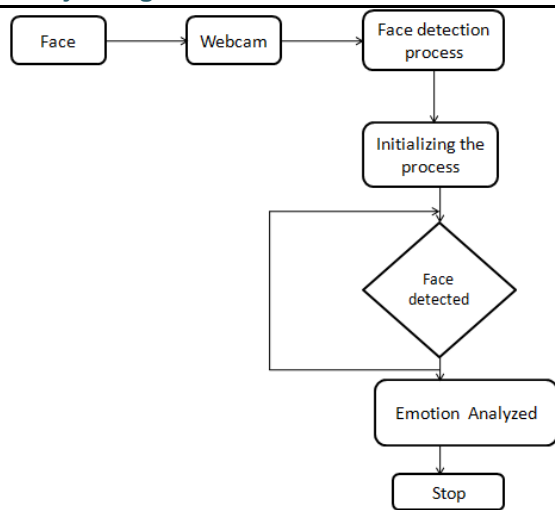
Figure 1: Face Detection

Figure 2: Emotion Classification

A. 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.

B. 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.
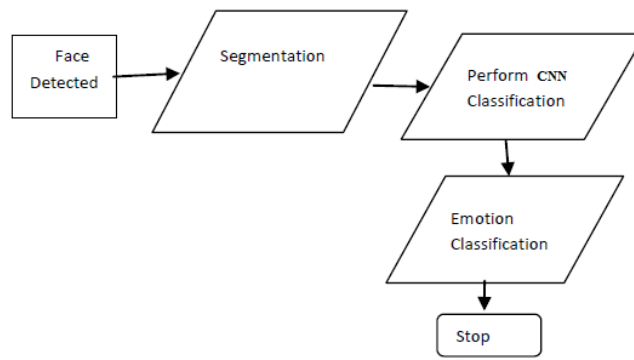
C. MUSIC RECOMMENDATION:

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 are 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 dentify 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 is 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 happy, anger, sad, surprise. 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.

4. CONCLUSION AND FUTURE ENHANCEMENT

we presented a music recommendation system based on emotion detected. The system uses a two-layer convolution network model for facial emotion recognition. The model classifies 7 different facial emotions from the image dataset. The model has comparable training accuracy and validation accuracy which convey that the model is having the best fit and is generalized to the data. We also recognize the room for improvement. It would be interesting to analyze how the system performs when additional emotions are taken into consideration. User preferences can be collected to improve the overall system using collaborative filtering. We plan to address these issues in future work.

The music player based on facial recognition system is highly essential for all the person in modern day life ecology. This system is further enhanced with benefit able features for upgrading in future. The methodology of enhancement in the automatic play of songs is done by detection of the facial expression. The facial expression is detected by programming interface with the RPI camera. An alternative method, based on additional emotions which is excluded in our system as disgust and fear. On this emotion included to support the playing of music automatically.

REFERENCES

[1] Raut, Nitisha, "Facial Emotion Recognition Using Machine Learning" (2018). Master's Projects. 632. https://doi.org/10.31979/etd.w5fs-s8wd

[2] Hemanth P,Adarsh ,Aswani C.B, Ajith P, Veena A Kumar, "EMO PLAYER: Emotion Based Music Player", International Research Journal of Engineering and Technology (IRJET), vol. 5, no. 4, April 2018, pp. 4822-87.

[3] Music Recommendation System: "Sound Tree", Dcengo Unchained: Sıla KAYA, BSc.; Duygu KABAKCI, BSc.; Işınsu KATIRCIOĞLU, BSc. and Koray KOCAKAYA BSc. Assistant : Dilek Önal Supervisors: Prof. Dr. İsmail Hakkı Toroslu, Prof. Dr. Veysi İşler Sponsor Company: ARGEDOR

[4] Tim Spittle, lucyd, GitHub, , April 16, 2020. Accessed on: [Online], Available at: https://github.com/timspit/lucyd

[5] A. Abdul, J. Chen, H.-Y. Liao, and S.-H. Chang, "An Emotion-Aware Personalized Music Recommendation System Using a Convolutional Neural Networks Approach," Applied Sciences, vol. 8, no. 7, p. 1103, Jul. 2018.

[6] Manas Sambare, FER2013 Dataset, Kaggle, July 19, 2020. Accessed on: September 9, 2020. [Online], Avalilable at: https://www.kaggle.com/msambare/fer2013

[7] MahmoudiMA, MMA Facial Expression Dataset, Kaggle, June 6, 2020. Accessed on: September 15, 2020. [Online], Available at: https://www.kaggle.com/mahmoudima/mma-facial-expression

[8] Dr. Shaik Asif Hussain and Ahlam Salim Abdallah Al Balushi, "A real time face emotion classification and recognition using deep learning model", 2020 Journal. of Phys.: Conf. Ser. 1432 012087

[9] P. Lucey, J. F. Cohn, T. Kanade, J. Saragih, Z. Ambadar and I. Matthews, "The Extended Cohn-Kanade Dataset (CK+): A complete dataset for action unit and emotion-specified expression," 2010 IEEE Computer Society Conference on Computer Vision and Pattern Recognition - Workshops, San Francisco, CA, USA, 2010, pp. 94-101, doi: 10.1109/CVPRW.2010.5543262.

[10] Puri, Raghav & Gupta, Archit & Sikri, Manas & Tiwari, Mohit & Pathak, Nitish & Goel, Shivendra. (2020). Emotion Detection using Image Processing in Python.