IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Emotion & Activity Based Music Player

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***Abstract*—** This research paper explores the development of an emotion and activity-based music player using machine learning techniques, specifically employing a Convolutional Neural Network (CNN) learning model. The objective of this project is to create an application that can detect the user's emotion and activity level, and recommend songs accordingly, enhancing the user's music listening experience. The proposed system aims to provide personalized music recommendations based on real-time emotion recognition, enabling users to discover and enjoy music that aligns with their current mood and activity.

Keywords— CNN, Deep learning, Feature Extraction

INTRODUCTION

Music is unreplaceable from our life. So to give proper recommendations of music we made application which gives music playlist as a recommendation to user according to user's emotion and their activity. First we provide our model input as a user's emotion by user's face and user's activity is recognized by their texts on phones. The system uses facial emotion recognition algorithms to detect emotions such as happiness, sadness, anger and more by analyzing facial expressions captured by the camera. Music player improves user experience. We developed facial recognition algorithm. A music recommendation tool is designed that takes into account the user's preferences, historical data and activity context and suggests suitable songs. The user interface is designed to be intuitive and user-friendly, allowing easy interaction with the music player application. However, it is important to acknowledge the limitations of facial emotion detection accuracy, the subjectivity of music preferences, the challenges of extracting emotion from text, and the complexity of capturing the full range of human emotions using only facial expressions or text analysis.

Our project demonstrated the application of machine learning algorithms and computer vision methods to suggest songs.

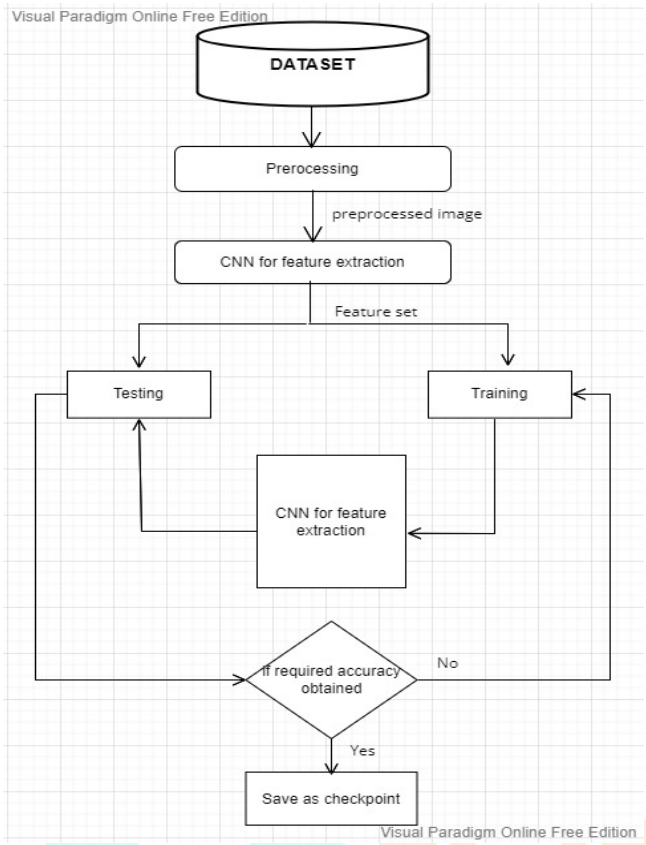
LITERATURE SURVEY

1. Emotion recognition with boosted tree classifier. 2013 ACM international conference on Multimodal Interaction . As shown in paper [4].
In this paper, author describe a simple system to recognize emotions, where small video clip send as a input to the system.

2. Sharik Khan, Hafeez Kabani, Omkar khan. International journal of engineering research and general science 2015. As shown in paper [2]
The significance of human expression in assessing an individual's current state and emotions by analyzing facial features such as eyes, cheeks, forehead, and smile is central to our project. We aim to combine this understanding of facial expressions with the soothing effects of music, detecting and responding to the detected mood by playing appropriate songs. This approach not only calms and uplifts the individual, but also eliminates the need for manual song selection, saving time. Furthermore, we are developing a versatile software that can be used anywhere, offering the functionality of playing music based on detected emotions. By creating a recommendation system, our project aims to assist users in making music choices that align with their mood, facilitating decision-making.

3. In a research article titled "MoodyPlayer: A Mood based Music Player" by Abhishek R. Patel, Anusha Vollal, Pradnyesh B. Kadam, Shikha Yadav, and Rahul M. Samant, published in the International Journal of Computer Applications (0975 8887) Volume 141 No.4 in 2016, the authors address the challenge of increasing and maintaining human productivity in stressful environments. They highlight the significance of music as a mood enhancer, contributing to improved states of mind and acting as a catalyst for increased productivity. Managing personalized song playlists for continuous music playback can be time-consuming, but it would be beneficial if the music player could automatically select songs based on the user's current mood, which can be detected through facial expressions..

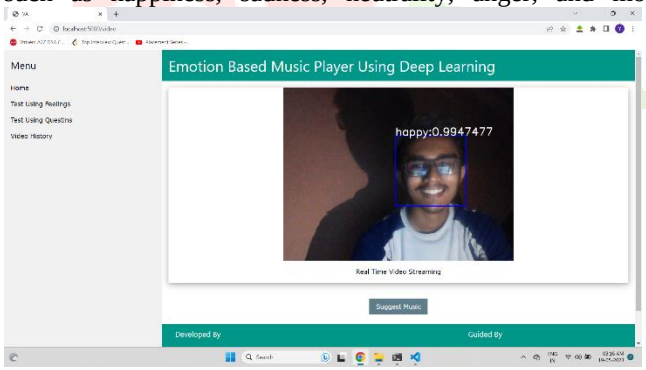
I. PROPOSED SYSTEM ARCHITECTURE



II. METHODOLOGY USED

A. *DATASET*

The accuracy of the model heavily relies on the quality of the dataset, making it a crucial metric to consider. In most studies conducted in this field, researchers have relied on self-generated datasets. Our dataset includes a range of emotions such as happiness, sadness, neutrality, anger, and more.



B. *Normalising the Inputs*

Data normalization plays a vital role in the training process by ensuring a consistent data distribution for each input parameter, typically pixels. This step facilitates faster convergence of the network. To achieve data normalization, the mean is subtracted from each pixel and the resulting value is divided by the standard deviation.

C. *Data Augmentation*

To introduce greater diversity and minimize the recognition of undesirable characteristics within the dataset. Typical augmentation techniques include scaling, rotations, and other affine transformations, enabling the neural network to experience a broader range of variations during training.

D. *Feature Extraction*

In the context of Convolutional Neural Networks (CNNs), feature extraction is a crucial process. CNNs are designed to extract relevant features from input images, and subsequently, these extracted features are classified by another neural network. The feature extraction network utilizes the input image to extract meaningful feature signals, which are then employed by the classification network for accurate classification.

E. *Image classification using CNN*

Page After the feature extraction using CNN we need to classify the images or videos (i.e., collection of frames). CNN uses various layers to classify the images

Steps for classification:

1. Convolution
2. Non Linearity (ReLU)
3. Pooling or Sub Sampling
4. Classification (Fully Connected Layer)

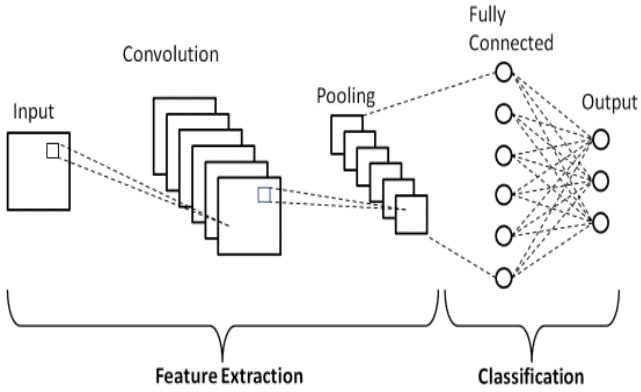


Image classification process in CNN

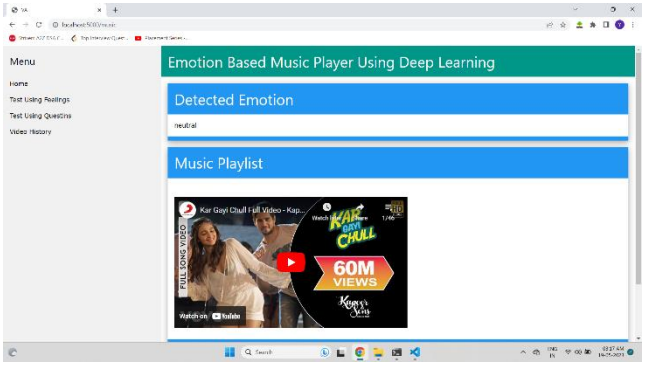
C. *Input to the Project*

We are giving input to this user's face detection project as

1. Image- We can give input as image
2. Recorded video- We can give input as recorded video (i.e., mp4) via video path
3. Real time video- We can open webcam to capture real time video

D. *Expected Output*

We are expecting the output of emotion and activity music player it gives or suggests songs to user



III. APPLICATIONS

The real-time emotion-based music player can be integrated with existing music streaming platforms to provide users with personalized recommendations based on their facial expressions.

IV. FUTURE SCOPE

We use this application for various different music platforms like spotify, gaana, apple music etc. By using this technique we can improve user experience. Currently many apps uses machine learning, data science and many new coming technologies for improving their interface and system. There is much more high possibility that by using machine learning and data science we can improve app notification and recommendation system.

ACKNOWLEDGMENT

We take great pleasure in presenting the initial project report titled "Emotion and activity based music player." The successful completion of this report owes a significant debt of gratitude to our guide, Prof. Minal Nerkar, whose expertise and encouragement played a vital role. We are also thankful to our respected sir, whose vision and knowledge greatly contributed to our research. The guidance provided by these individuals has been invaluable. Additionally, we express our appreciation to Dr. Sarika Zaware, Head of the Computer Engineering Department at AISSMS Institute of Information Technology, for her valuable support. We thanks to Principal Dr. P. B. Mane for his dynamic and invaluable guidance throughout the project, as well as for providing the necessary facilities that facilitated the completion of our dissertation work.

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