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In Collaboration with

UNIVERSITY OF WESTMINSTER

TUNE MOODS

Emotion Driven Music Playlist Generator

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Submitted in partial fulfillment of the requirements for the BEng (Hons)
Software Engineering

degree at the University of Westminster

September 2024

ABSTRACT

In today's fast-paced world, stress and emotional disturbances significantly impact mental well-being. Music has long been recognized as a powerful stress reliever, but its effectiveness depends on aligning with the listener's current mood. Existing affect-based music recommendation systems are limited, primarily identifying only four emotions and lacking real-time personalization. To address this gap, TUNE MOODS introduces a framework for emotion-driven music playlist generation that detects a broader range of seven emotions: Anger, Disgust, Fear, Happiness, Sadness, Surprise, and Neutral, providing more precise and personalized music recommendations. Additionally, it suggests engaging activities such as games, videos, exercises, and inspirational quotes to help users transition to a positive emotional state.

At the core of TUNE MOODS is a Convolutional Neural Network (CNN) trained for facial expression recognition using a webcam. The model architecture consists of convolutional layers for feature extraction, pooling layers for dimensionality reduction, and fully connected layers for classification. The FER-2013 dataset was used for training and validation, enabling real-time emotion recognition, which is then mapped to a curated music playlist. Furthermore, the system employs a structured mood transition strategy, guiding users from negative emotions to positive ones through music and interactive activities.

Performance evaluation showed that the CNN model achieved a Training Accuracy of 77.73%, Validation Accuracy of 66.44%, and an F1 Score of 66%, demonstrating strong emotion classification capabilities. A confusion matrix confirmed its ability to distinguish emotions with high precision. User engagement metrics and feedback further validated that personalized music recommendations and suggested activities effectively aid in emotional regulation. These results establish TUNE MOODS as an innovative and holistic approach to integrating emotion recognition and music therapy for improved mental well-being.

Keywords: emotion-based music therapy, individualized playlists, Convolutional Neural Network (CNN), facial expression analysis, emotion prediction, mental well-being, FER-2013 dataset, emotional states, music and stress relief

Subject Descriptors: Machine Learning, Image Processing, Music Recommendations System