

AI Mood Wave Music Player

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Abstract

Music is a universal language that profoundly impacts human emotions and well-being. However, traditional music recommendation systems rely primarily on historical listening data and trending content, failing to address users' real-time emotional states and regional language preferences. This project presents an innovative AI-driven music recommendation platform that detects facial emotions in real-time and delivers personalized, culturally relevant playlists tailored to the user's current mood and language choice. The system utilizes DeepFace, a CNN-based deep learning framework, combined with OpenCV for live webcam video capture and facial expression analysis. Emotions such as happy, sad, calm, angry, and energetic are classified automatically without requiring custom model training. User studies demonstrate high satisfaction ratings in usability, relevance, and cultural personalization, validating the system's effectiveness in enhancing digital music experiences through intelligent, emotion-aware recommendations.

Keywords— Emotion Recognition, DeepFace, Music Recommendation, Python, OpenCV

1. Introduction

Music has a strong impact on human emotions and mental well-being. This project proposes an AI-based Mood Wave Music Player that recommends songs based on the user's mood. The system uses machine learning techniques to identify emotions through user input or facial expressions. Based on the detected mood, personalized music is suggested. This enhances user experience by providing adaptive and emotion-aware music recommendations. The project demonstrates the role of AI in creating intelligent entertainment systems.

4. Results and Discussion

This section presents the experimental results obtained using the proposed method. Performance metrics are analyzed to ensure the real-time detection of five core emotional states. Users interactively select preferred languages—Hindi, English, Kannada, or Telugu and receive curated playlists with direct streaming links to YouTube. The discussion highlights the advantages of this solution in terms of cultural personalization and user privacy.

2. Related work

The related work in emotion-based music recommendation focuses on detecting human emotions using facial recognition and mapping them to suitable playlists. Early systems used basic image processing, while recent approaches apply deep learning models like CNNs and ResNet for better accuracy. Some studies also include user context or generate music based on emotions. However, most systems lack multilingual support and real-time adaptability. The proposed system addresses these gaps by combining real-time emotion detection with language-based music recommendations for a more personalized experience.

3. Materials and Methods

System Architecture: The solution utilizes the DeepFace CNN-based framework and OpenCV for live facial expression analysis.

Emotion Classification: The system automatically classifies emotions including happy, sad, calm, angry, and energetic.

Data Management: Implemented in Python, the system employs Pandas for efficient management of a custom CSV dataset containing emotion-language-song mappings.

Privacy: The architecture ensures all facial data is processed locally, meaning no biometric information is stored or transmitted.

5. Conclusion

The conclusion summarizes the key findings and contributions of the study. It emphasizes the effectiveness of the AI Mood Wave Music Player in bridging technology and emotion. Future research directions, such as expanding the song dataset or refining the CNN model for more nuanced expressions, are briefly discussed.

Reference

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