
EMO MUSIC - THE RHYTHM TO YOUR EMOTIONS

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ABSTRACT

In order to enhance mental health and productivity, it is crucial to align music with one's emotional state. However, traditional methods of manually choosing music often fall short in accurately reflecting a user's mood, which can have negative emotional consequences. To tackle this issue, our proposed system utilizes an automated mechanism that selects music in real-time based on facial recognition patterns and advanced algorithms for emotional detection. This approach not only saves time in music selection but also enhances the accuracy of matching music to one's mood, reducing the risk of emotional harm caused by mismatched music. Research has demonstrated that well-matched music can significantly reduce depression rates and improve emotional well-being. Unlike existing systems, our solution incorporates comprehensive music affinity patterns derived from extensive studies, providing music that deeply resonates with users' emotional states. This creates a positive and supportive environment that fosters mental wellness.

Keywords: Mood-Based Music Selection, Automated System, Emotional Well-Being, Facial Recognition Patterns, Mental Health, Productivity.

I. INTRODUCTION

The "Emotion Detecting and Song Recommendation" project is an innovative endeavor that combines technology with emotional intelligence to provide a unique and tailored user experience. This project has the potential to impact various aspects of daily life, from entertainment to mental health, showcasing the transformative capabilities of AI in improving human-computer interactions. As the system continues to develop, it aims to not just meet but surpass user expectations, creating digital experiences that are more emotionally engaging and satisfying.

Using advanced algorithms and machine learning models, the system is able to identify subtle changes in facial expressions that indicate different emotional states. These insights are then used by the recommendation engine to curate a personalized music playlist that aligns with the user's current emotions. By drawing from extensive music databases, the system can match songs based on genre, tempo, emotional content, and the user's past preferences.

II. LITERATURE REVIEW

1. M . Sunitha, T. Adilakshmi, Sai Suman Chitturi & Praneeth Kapila "Deep Learning-Based Emotion-Aware Music Recommendation System" [2023][1] – Music plays a crucial role in enhancing our daily lives by boosting our moods. However, with the abundance of digital music available, finding the perfect song to match our emotions can be difficult. This emphasizes the importance of a context-sensitive music recommendation system. The suggested system identifies a user's current emotion, mainly through facial expressions, and suggests music that aligns with that emotion. By incorporating context and emotion, this approach improves user preference prediction, resulting in a more intuitive and enjoyable listening experience. The evaluation and performance metrics of this system are also explored.

2. Mohammad Tabrez Quasim, Eman H. Alkhamash, Mohammad Ayoub Khan & Myriam Hadjouni "Emotion-based music recommendation and classification using machine learning with IoT Framework" [2019][2] – A team of researchers has created a framework called EMRCF that combines emotional maturity with IoT systems to recommend and classify music based on emotions. This framework uses empathic analysis and musical characteristics identified through team discussions in a small business to categorize songs according to individuals' emotional states. By utilizing correlation analysis and neural networks, the EMRCF has achieved a prediction accuracy of 96.12% and a precision rate of 96.69%. It surpasses

other algorithms such as decision trees, deep cognitive systems, and relevance vector machines in accurately classifying emotional reactions to music.

3. Selin Sara Varghese, Manjiri Kherdekar, Benitta Mariam Babu & Archana Shirke "Emotion Recognition-Based Music Recommendation System Using Machine Learning" [2022][3] – Machines lack the natural ability to predict emotions from facial expressions, unlike humans. However, teaching computers to recognize emotions can have practical uses, such as instantly responding to user preferences and improving user moods. Recent studies have shown a strong connection between music preferences and emotions and personality. While factors like age, culture, and context can influence music responses, songs can also be categorized by emotion. By using AI to recommend music based on facial expressions, users, especially those with mood disorders, can benefit from receiving therapeutic music that is tailored to their emotional state. This project aims to create a system that can identify moods from facial expressions and suggest appropriate music, taking advantage of the rapid advancements and widespread applications of AI in everyday life.

4. Saba Yousefian Jazi, Marjan Kaedi & Afsaneh Fatemi "An emotion-aware music recommender system" [2023][4] –The passage discusses the limitations of current emotion-aware music recommender systems, which typically base music suggestions on the user's current emotional state. However, there are two key reasons why these systems require improvement. Firstly, inaccurately identifying the user's emotion can result in recommendation errors. Secondly, user interaction patterns such as keystrokes and mouse clicks, which can indicate emotions, are not currently utilized in these systems. This study introduces a system that directly links these interaction patterns to the user's preferred music without explicitly labeling the current emotion. The findings show that this approach achieves higher accuracy compared to previous methods, even without the need for additional devices.

5. Tina Babu, Rekha R Nair and Geetha A "Emotion-Aware Music Recommendation System: Enhancing User Experience Through Real-Time Emotional Context" [2024][5] – This study emphasizes the limitations of traditional music recommendation systems, which typically disregard the emotional context of users' music preferences and primarily rely on past listening behavior. These systems often fail to align recommendations with the users' present moods, resulting in a less satisfying music experience and missing out on emotionally impactful songs. To tackle these issues, the research proposes an AI model that incorporates real-time emotional detection to provide personalized song recommendations based on the user's current emotional state. This approach aims to enhance the user experience by offering music that resonates with their mood, evokes the desired emotions, and provides a more immersive and meaningful listening experience. Ultimately, this enables a personalized and emotionally engaging musical journey.

III. METHODOLOGY

1. Facial Expression Recognition: The system utilizes real-time analysis with Mediapipe and OpenCV to detect and interpret facial expressions such as happiness, sadness, or anger.

2. Feature Extraction: Facial features like eyebrow movement, eye openness, and mouth shape are extracted and analyzed to determine the user's emotional state.

3. Emotion Classification: Machine learning algorithms classify detected emotions into categories like happy, sad, or surprised for personalized music recommendations.

4. Real Time Emotion Tracking: Continuous monitoring of facial expressions allows the system to dynamically adjust music recommendations based on changes in the user's emotional state.

5. Sentiment Analysis: The system goes beyond basic emotion detection to analyze facial cues for intensity and context, refining music suggestions accordingly.

6. Dynamic Playlist Generation: Playlists are generated or adapted based on real-time emotional data to suit the user's current emotional profile and preferences.

7. Preferences Learning: The system learns from user interactions over time to personalize music recommendations based on individual emotional responses and feedback.

8. User Feedback Integration: User feedback on recommended music tracks is integrated to improve the accuracy and relevance of future recommendations.

9. Contextual Awareness: Consideration of contextual factors like time of day or location enhances the relevance of music selections to the user's environment.

10. Cross-Modal Integration: Integration with other sensory data like voice analysis and heart rate enhances the system's ability to accurately interpret and respond to the user's emotional cues for music recommendations.

IV. DATAFLOW DIAGRAM

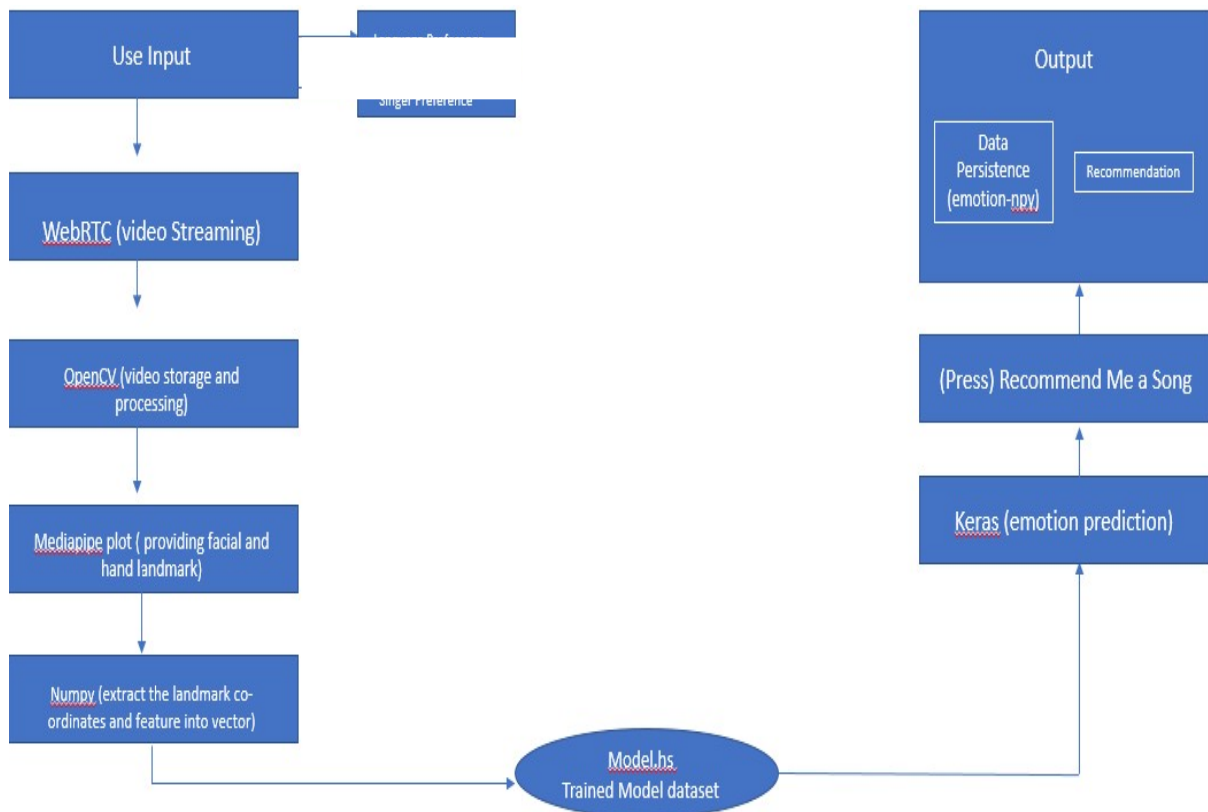


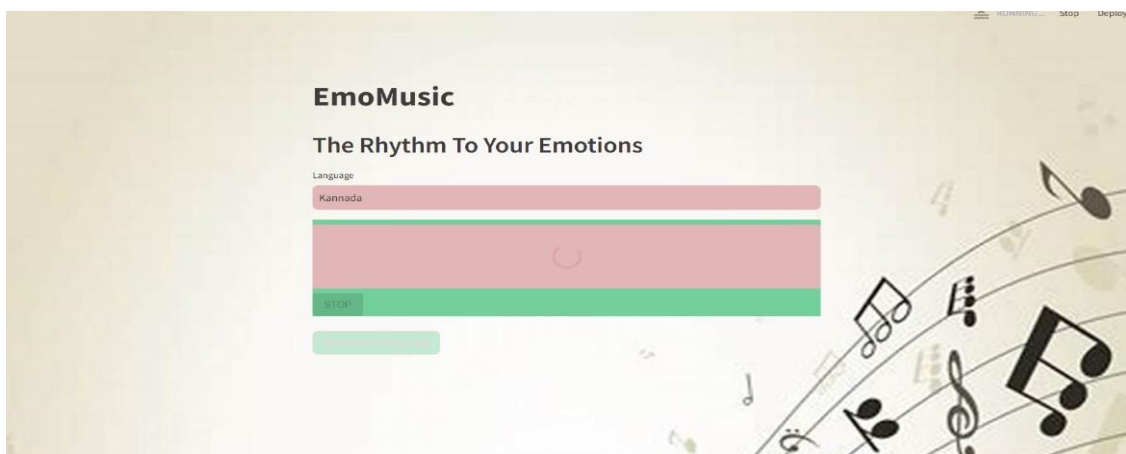
Figure 1

V. RESULTS

The Emotion-Based Music Recommender system seamlessly combines computer vision, machine learning, and web technologies to detect emotions and recommend music based on identified emotions, language, and singer preferences. An illustration involving Test User is included to showcase the system's typical functionality.

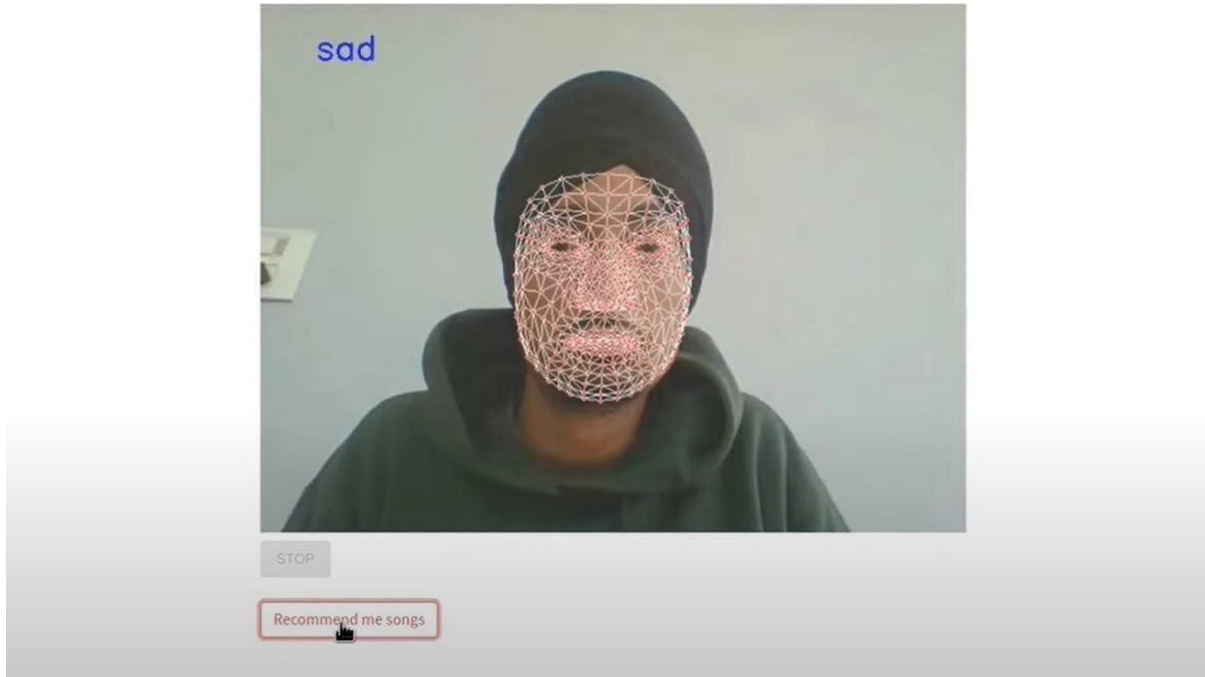
User Interface:

This page represents the User interface where the user has to prompt the preferred language and click Enter to continue.

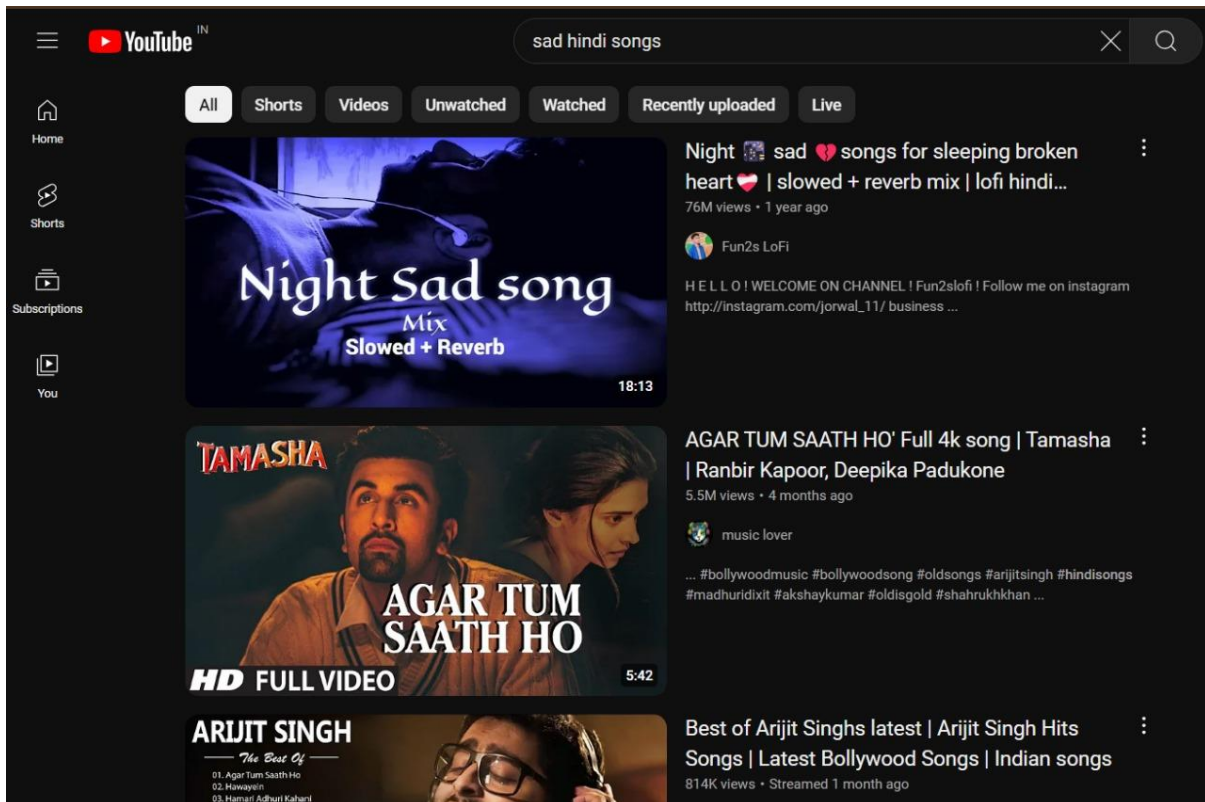


Output:

This page pops up a dialogue box to capture your emotion in real-time and displays your emotion using the trained model. Then for the **preferred Emotion** user clicks on the “Recommend me songs” button to continue.



After Clicking on the “Recommend me songs” button user is directed to youtube with the **Emotion Captured** and the **preferred language** in the Youtube query.



VI. CONCLUSION

In conclusion, the emotion-based music recommender that utilizes facial recognition technology with the Mediapipe Holistic model and OpenCV has shown great promise in improving user satisfaction with

personalized music suggestions. By accurately identifying and interpreting facial expressions like happiness, sadness, and surprise in real-time, the system can effectively customize music choices to match the user's mood. Notable features include the reliability of the facial recognition system in capturing subtle emotional signals, the ability to adjust music playlists based on detected emotions, and the incorporation of user feedback to enhance recommendations. Moving forward, advancements in algorithm development, sensor technology, and user interface design are expected to enhance the accuracy, responsiveness, and user interaction of the recommender in various entertainment, wellness, and interactive media applications. This technology highlights the potential of combining artificial intelligence with human emotion recognition to create more engaging and personalized digital experiences.

VII. REFERENCES

- [1] M. Sunitha, T. Adilakshmi, Sai Suman Chitturi & Praneeth Kapila "Deep Learning-Based Emotion-Aware Music Recommendation System" [2023]
- [2] Mohammad Tabrez Quasim, Eman H. Alkhamash, Mohammad Ayoub Khan & Myriam Hadjouni "Emotion-based music recommendation and classification using machine learning with IoT Framework" [2019]
- [3] Selin Sara Varghese, Manjiri Kherdekar, Benitta Mariam Babu & Archana Shirke "Emotion Recognition-Based Music Recommendation System Using Machine Learning" [2022]
- [4] Saba Yousefian Jazi, Marjan Kaedi & Afsaneh Fatemi "An emotion-aware music recommender system" [2023]
- [5] Tina Babu, Rekha R Nair and Geetha A "Emotion-Aware Music Recommendation System: Enhancing User Experience Through Real-Time Emotional Context" [2024]