

VibeSync-Mood Based Song Recommendation System

Syeda Fatima¹, Jashwanthi.K², Spoorthy Reddy.D³, Sravani.M⁴, Sri Bhavya Sai.M⁵

¹Assistant Professor, Department of CSE(AI&ML), Bhoj Reddy Engineering College for Women, India ^{2,3,4,5}B.Tech Students, Department of CSE(AI&ML), Bhoj Reddy Engineering College for Women, India

Abstract

VibeSync is an AI-powered music recommendation system that suggests songs based on the user's current mood, identified through facial expression analysis. The system uses computer vision and machine learning techniques to detect emotions such as happiness, sadness, anger, and neutrality by analyzing real-time input from the user's webcam. These emotional states are mapped to mood categories, which are then used to generate customized song recommendations from a predefined music database.

VibeSync features a user-friendly interface that displays the detected mood and provides relevant song suggestions instantly. Unlike traditional recommendation systems that rely on user input or listening history, VibeSync responds to real-time emotional cues, offering a more dynamic and personalized listening experience.

This project showcases the effective integration of facial expression detection, emotion classification, and multimedia processing. It demonstrates how artificial intelligence can be used to create emotionally intelligent applications that enhance user engagement, promote mental wellness, and personalize digital experiences.

Introduction

1.1 VibeSync

VibeSync is a mood-based music recommendation system that detects a user's facial expression in realtime and suggests songs based on their emotional state. By analyzing facial features using computer vision techniques, the system identifies moods such as happy, sad, or relaxed and recommends suitable songs from a predefined music database. With a simple interface and accurate mood detection, VibeSync offers a personalized and emotionally engaging music experience. It highlights the practical use of AI and computer vision in multimedia applications.

1.2 Existing System

In the current music recommendation systems, suggestions are primarily based on user behavior such as listening history, likes, search patterns, or manually selected genres and moods. Applications like Wynk, Gaana, and Apple Music offer users the option to choose from predefined mood categories; however, this approach relies entirely on manual input. These systems lack the ability to understand the user's real-time emotional state, which means they cannot adapt to the user's immediate feelings or facial expressions. Moreover, personalization in these systems develops gradually over time and often lacks emotional context, leading to a less immersive experience.

Proposed system

VibeSync, introduces a novel approach by incorporating facial expression recognition to detect the user's mood in real-time. By using computer vision techniques through the device's webcam, VibeSync can identify emotions such as happiness, sadness, calmness, or anger without requiring any manual input. Based on the detected mood, the system then recommends songs from a predefined music database that match the user's emotional state. This real-time



mood detection and automatic music suggestion creates a highly personalized and emotionally responsive user experience. VibeSync enhances traditional recommendation methods by integrating artificial intelligence and emotionaware computing, resulting in a smarter, more engaging music experience.

Design

- Design represents the number of components we are using as a part of the
- 3.1 Software Architecture

project and the flow of request processing i.e., what components in processing the request and in which order.

• An architecture description is a formal description and representation of a system organized in a way that supports reasoning about the structure of the system.



Fig.no.3.1

3.2 Technical Architecture





.Implementation

4.1 Technologies

Our system VibeSync uses multiple modalities for emotion detection — including facial expressions (via DeepFace and OpenCV), voice input (via SpeechRecognition), and text (via



Hugging Face's emotion classification model). These detected emotions are used to recommend personalized music to users. The system backend is powered by Node.js, Python, and MongoDB for real-time functionality

Technology	Purpose in VibeSync	
Node.js	Handles backend communication and routes between user interface and ML services.	
Python 3.8+	Hosts all AI/ML functionalities including emotion detection and model execution.	
MongoDB	Stores user data, emotion history, and personalized song recommendations.	
Virtual Environment	Isolates Python libraries for clean and conflict-free execution.	
.env File	Holds credentials (e.g., Mongo URI, API keys) securely.	
DeepFace	Detects facial emotions from camera input using computer vision models.	
OpenCV	Used for capturing live video from the webcam and processing image frames.	
SpeechRecognition	Converts spoken input to text (e.g., "I feel stressed today") for emotion analysis.	
Hugging Face Model	(j-hartmann/emotion-english-distilroberta-base) — detects emotion from user text .	

T ESTING



- 6. Test Cases
- 7.

Test	Test Case	Test Data	Expected Result	Actual Result	Pass/Fail
Case	Description				
ID					
TC01	Facial mood	Smiling	Detects "happy" \rightarrow	Playlist with energetic	Pass
	detection for happy	face	Shows happy playlist	songs displayed	
	emotion				
TC02	Facial mood	Sad face	Detects "sad" \rightarrow	Playlist with mellow	Pass
	detection for sad		Shows sad playlist	songs displayed	
	emotion				
TC03	Facial mood	Angry face	Detects "angry" \rightarrow	Playlist with soothing	Pass
	detection for angry		Shows calming	songs displayed	
	emotion		playlist		
TC04	Facial mood	Neutral	Detects "neutral" \rightarrow	Playlist with lo-fi/chill	Pass
	detection for neutral	face	Shows neutral	songs displayed	
	emotion		playlist		
TC05	Voice input saying	Speech: "I	Detects "happy" from	Playlist with joyful songs	Pass
	"I am happy"	am happy"	text \rightarrow Shows happy	displayed	
			playlist		
TC06	Voice input saying	Speech: "I	Detects "sad" from	Playlist with emotional	Pass
	"I am sad"	am sad"	text \rightarrow Shows sad	songs displayed	
			playlist		
TC07	Voice input with	Speech	Cannot transcribe \rightarrow	"Please try again"	Pass
	background noise	with noise	Shows retry prompt	message shown	
TC08	Text input	Text: "I'm	Detects "angry" \rightarrow	Playlist with soft music	Pass
	expressing anger	really	Shows calm playlist	displayed	
		angry			
		today"			
TC09	Text input	Text: "I'm	Detects "happy" \rightarrow	Playlist with upbeat songs	Pass
	expressing	feeling	Shows happy playlist	displayed	
	happiness	awesome			
		today"			
TC10	Text input with no	Text:	No emotion \rightarrow Show	Generic/trending playlist	Pass
	emotion	"Search	default playlist	displayed	
		trending			
		songs"			



Jashwanthi.K et. al., /International Journal of Engineering & Science Research

TC11	All inputs used at	Нарру	System processes	Playlist based on selected	Pass
	once (facial, text,	face + Sad	latest/selected input	input shown	
	voice)	text +	\rightarrow Mood matched		
		Neutral			
		voice			
TC12	Internet	Any input	Connection fails \rightarrow	"No internet connection"	Pass
	disconnected	(face, text,	Show error	message shown	
		voice)			

Screenshots

Create Your VibeSync Account	Usemame Email Address Password Contim Password Register		
Usemane Email Address Password Confirm Password Register	Username Email Address. Pessword Contim Password Register		
Email Address Pessword Contem Pessword Register	Email Address. Pessword Contim Password Register	Create Yo	ur VibeSync Accou
Password Confirm Password Register	Password Confirm Password Register	Username	
Contem Password Register	Confirm Password Register	Email Addre	055
Register	Register	Password	
		Confirm Pas	issword
Already have an account? Login	Aiready have an account? Login		Register
		· · · · · · · · · · · · · · · · · · ·	Already have an account? Login

Fig 6.1 Signup page

Usemans Usemans Password Login Don't heve an account? <u>Register heres</u>	

Fig.6.2 Login Page



	t Your Mood Choose	the Music 🞧
		Type your mood here
		Search
Start Face Scan		
+ 20	025 VibeSync Mood-Based Music Recommender Bult with	•

Fig.6.3 Homepage

	e the Music { }
	Нарру
	Search
	Detected Mood: happy Sange Based on Your Mood 👔
Start Face Scan	► 0:00/0:30 — ● i
	Good Life - OneRepublic 🖤
	► 0:00/0:30 — ● I

Fig.6.4 Homepage



		happy
	Detected Mood: set Songs Based on Your Mood 2	Search
	Someone Like You - Adele 🤎	Detected Mood: happy Songs Based on Your Mood 🞜
	► 0:00 / 0:30	
Start Face Scan		► 0:00 / 0:30
		Good Life - OneRepublic 🆤
	► 0:00 / 0:30 → ● E	► 0:00/0:30 - • • i



Emotion: happy	lood Choose	the Music 🎧
B	e Command Start Listening Mood J7 Adeie	Text Assistant happy & Search Detected Mond: happy Songs Band on Your Mond P
1: NA 1	••••••••••••••••••••••••••••••••••••••	Happy - Phanell Williams 🔍 • 0:00/0:30 40 ; Cood Life - OneRepublic 😻
		► 0:00/0:30

Fig.6.6 Mood detection By Facial Analysis

		happy
	Detected Mood: sad Sorres Based on Your Mood J	Search
	Someone Like You - Adele 🖤	Detected Mood: happy Songs Based on Your Mood 🞜
	► 0:00 / 0:30	
Start Face Scan		► 0:00 / 0:30 → ◆
Detected Mood: happy Songs Based on Your Mood J		Good Life - OneRepublic 🤎
	► 0:00 / 0:30	• 0:00/0:30 •0
► 0:00 / 0:30 → ◆ I		• 0:0070:30
Good Life - OneRepublic		
► 0:00 / 0:30 +0 i		

Fig.6.7 Songs Recommendations



	Your Mood Choose the Music 🎧
	User Profile
User Info Name: Admin Email: admin@gmail.com	Listening Stats Recently Played Songs Listening History Liked Songs
- Back	
	Vilačým: [Mood/Seard Mood/ Necomeneodes [Tablit with 💌

Fig.6.8 Profile Page

VibeSync – Let Your Mood Choose the Music ()
Recently Played Songs Fix You - Coldplay
 ► 0.00/030
Someone Like You - Adele 0.00/0.00 0.00 / 0.00
• Happy - Pharrell Williams

Fig.6.9 Recently Played Songs



Jashwanthi.K et. al., /International Journal of Engineering & Science Research

VibeSync – Let Your Mood Choose the Music 🎧			
Listening History Happy - Pharrell Williams 			
• 000/0:30	۲	1	
Good Life - OneRepublic 0.00 / 0.30	۰	1	
Someone Like You - Adele 0.00/0:30	•	1	

Fig.6.10 Listening History

VibeSync – Let Your Mood Choose the Music 🕢
Liked Songs • Good Life - OneRepublic 🖤
• 0.00 / 0.30
6.007/0.30 49
🔿 XXI Watchne (Moosh Sacrid More Recomminder (Soft with 🌳



VibeSync – Le	et Your Mood Choose the Music 🎧
	Settings
General Settings Notifications: Enabled Togle Theme: Auto	Account Management Edit Profile Info Change Password Logout
- Back	
	25 Whedgers J Moard-Based Mines Recommender Built with 🖤



Fig.6.12 Settings page

VibeSync – Let Your Mood Choose the Music 🎧
Edit Profile Info Name: Email:
M Save — Cancel
de 2025 Mardigese (Masadi Masari Recommensari (Bulk antir 🗣

Fig.6.13 Edit Profile Page

	Change Password Current Password: New Password: Confirm New Password:	
🔐 Save		- Cancel
	© 2025 Vibetyme Mood-Based Music Recommender Built with 👁	

Fig.6.14 Password Settings



Jashwanthi.K et. al., /International Journal of Engineering & Science Research

VibeSync –	127.0.0.1:5000 says You have been logged out. Redirecting to login page	
	Settings	
General Settings	Account Management	
Notifications: Enabled	Edit Profile Info Change Password	
Theme: Auto	Logout	
- Back		
	In MANY Property and the first of the second structure of the second structure of	

Fig.6.15 Password Changed - Logged out

Conclusion & Future Scope

7.1 Conclusion

VibeSync successfully demonstrates how emotional intelligence can be integrated into user-centric applications using technologies like facial recognition, speech processing, and text analysis. By allowing users to interact naturally-through their expressions, voice, or typed emotions-the system offers а personalized music experience tailored to their mood. The application ensures simplicity, accuracy, and user engagement, proving that mood-based recommendation systems can enhance digital interaction and emotional wellbeing.

7.2 Future Scope

- Add more languages
 - Support voice input in different regional and international languages.

• Improve mood detection

- Make the system better at detecting mixed or strong emotions.
- Mobile App Version
 - Create a mobile app so users can enjoy VibeSync anywhere.
- Connect with music apps
 - Link VibeSync with Spotify or YouTube for better playlists.
- o Save mood history
 - Show users a history of their moods and songs over time.
- Offline use
 - Let users access basic features even without internet.

8.References



- <u>https://www.researchgate.net/publication/3</u>
 <u>52780489_Mood_based_music_recommen</u> <u>dation_system</u>
- <u>https://www.ijert.org/research/mood-based-</u> <u>music-recommendation-system-</u> <u>IJERTV10IS060253.pdf</u>
- 3) <u>https://www.jatit.org/volumes/Vol100No19</u> /24Vol100No19.pdf