

CHATBOT SONG RECOMMENDATION SYSTEM

A Minor Project Report Submitted To



Rajiv Gandhi Proudhyogiki Vishwavidyalaya, Bhopal

Towards Partial Fulfilment for the Award Of

Bachelor of Technology

In

ARTIFICIAL INTELLIGENCE & DATA SCIENCE

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[An Institution Approved By AICTE, New Delhi & Affiliated To RGPV, Bhopal]



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DECLARATION

We **Muskan Dubey, Mariya Bohra, Palak Gupta and Ayush Bhagwat** hereby declare that the project entitled “**Chatbot Song Recommendation System**”, which is submitted by us for the partial fulfilment of the requirement for the award of Bachelor of Technology in Artificial Intelligence & Data Science to the Prestige Institute of Engineering, Management and Research, Indore (M.P.). Rajiv Gandhi Proudhogiki Vishwavidyalaya, Bhopal, comprises my own work and due acknowledgement has been made in text to all other material used.

Signature of Students:

Date:

Place:



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DISSERTATION APPROVAL SHEET

This is to certify that the dissertation entitled “**Chatbot Song Recommendation System**” submitted by **Muskan Dubey (0863AD211037), Mariya Bohra (0863AD211036), Palak Gupta (0863AD211040) and Ayush Bhagwat (0863AD211016)** to the Prestige Institute of Engineering, Management and Research, Indore (M.P.) is approved as fulfilment for the award of the degree of Bachelor of Technology in Artificial Intelligence & Data Science by Rajiv Gandhi Proudhogiki Vishwavidyalaya, Bhopal, (M.P.).

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**PRESTIGE INSTITUTE OF ENGINEERING MANAGEMENT AND RESEARCH
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CERTIFICATE

This is certified that project entitled “**Chatbot Song Recommendation System**” submitted by **Muskan Dubey, Mariya Bohra, Palak Gupta and Ayush Bhagwat** is a satisfactory account of the bona fide work done under our supervision and is recommended towards partial fulfilment for the award of the degree Bachelor of Technology in Artificial Intelligence & Data Science to Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal (M.P.) .

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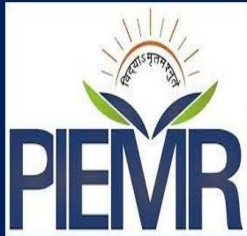
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CHAPTER 1

INTRODUCTION

1.1 Project Poster



PRESTIGE INSTITUTE OF ENGINEERING MANAGEMENT AND RESEARCH
DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

Chatbot Song Recommendation System

Guided by: Dr. Naveen R Shahi

Submitted by : Muskan Dubey, Palak Gupta, Mariya Bohra, Ayush Bhagwat

ABSTRACT

Chatting with the chat bot, current mood of the user is analyzed and list of songs is suggested to user, using the concept of NLP (Natural Language Processing). Based on the list of songs user can choose the song to be played based on his or her choice. We have used Python as our prime language because it supports an extensive set of open-source libraries which can be used by our system.

INTRODUCTION

One area which has been gaining momentum is the use of **chatbots** for music recommendation. Such systems utilise AI technologies to deliver personalised music recommendations to users via conversational interfaces.

KEYWORDS

Interactive Chat Bot, Interactive System User Interface, Recommender System,, Natural Language Processing, Sentimental Analysis.

SYSTEM DIAGRAM



TECHNOLOGY



APPLICATION

Song recommender systems find applications in various domains, enhancing music discovery and user experience:

1. Music Streaming Platforms
2. Collaborative Playlists
3. Mood-Based Recommendations

1.2 Abstract

Human emotions have recently become much more important. Emotions are based on human feelings, which can be expressed or not, and they serve as different types of behavioral indications. The exclusion of emotions aids in identifying a person's behavioral state. The main objective of this paper is to recommend appropriate music based on the user's emotional state using a suitable program that is readily available. This paper focuses on a chatbot that uses artificial to analyze the user's tone in text form as users increasingly interact with systems through text and voice assistants. A chatbot is a computer software created specifically for messaging networks that uses artificial intelligence to engage in conversations with humans. The chatbot saves the user's input after each interaction and uses a tone analyzer program to process the user's text response for subsequent interactions. A significant source of entertainment and motivation to move on, music has the power to significantly enhance and improve one's mood. Recent studies have shown that music has a positive effect on human brain activity and that people respond and react favorably to music.

1.3 Introduction

Everyday, each and every person undergoes lot of troubles and the reliever of all the stress that are encountered is Music. If it is so, the vital part of hearing the song has to be in a facilitated way, that is player able to play the song in accordance to the person's mood. The paper proposes such a player and hence named Emotion based music player. Recognizing the human emotions is considered to be a global consistency but depict variability among the humans on the basis of their abilities. The different approaches being the classification of emotions that are existing are depicted as knowledge-based, statistical and hybrid techniques. However there relies several difficulties while retrieving the music information such as querying by singing, genre classification, etc. The most possible implementation is by producing music suggestion that is based on the content. The multiple efforts to detect and describe the feeling, to classify based on features are all wanted to obtain outstanding music recommendation system.

1.4 Overview of the project

The project aims to develop a chatbot song recommendation system that enhances user experience by providing personalized music suggestions through a conversational interface. In today's digital age, where music streaming platforms offer vast catalogs of songs, users often face the challenge of discovering new music that aligns with their preferences. Traditional recommendation systems typically rely on user interactions, such as likes, dislikes, or ratings, to generate recommendations.

1.5 Methodology

A chatbot is a conversational software program designed to replicate human communication skills. It engages people in discussion automatically. It's a modern, innovative method of customer service that makes use of a chat interface and artificial intelligence. AI-powered chatbots have the ability to understand natural language, discern meaning and emotion, and formulate smart responses. Customers don't have to wait in phone lines or send a lot of emails to get answers to their questions, for instance, and may do it in a comfortable way. It is not simple, though, because achieving these traits calls for a variety of complex system interactions. The word 'AI chatbot' is used in this study as a synonym for a conversational agent or advanced dialogue system. Two significant developments have contributed to the rising interest in chatbots. First of all, the expansion of messaging services has been growing in recent years. It includes features like payments, purchasing, and booking that require a different program or website. In order to avoid downloading several applications, users can carry out tasks like making purchases, bookings at restaurants, and question-asking all through their chosen chat apps. The most well-known applications include Line, WeChat, WhatsApp, and Facebook Messenger. Second, the ability to understand and make decisions using inexpensive computer power purchases, bookings at restaurants, and question asking all through their chosen chat apps. The most well-known applications include Line, WeChat, WhatsApp, and Facebook Messenger.

Second, the ability to understand and make decisions using inexpensive computer power has significantly improved International Journal of Engineering Research & Technology to a combination of deep learning and machine learning.

1.6 Applications

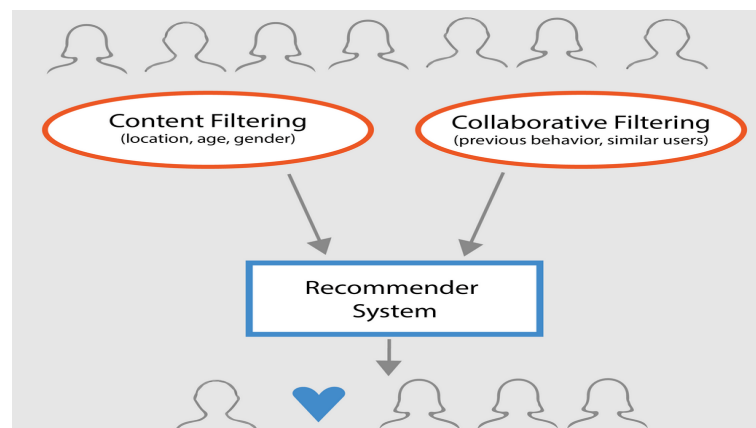
- **Personalized Music Discovery:** Chatbots allow users to express their musical preferences through natural language input. Users can specify their favorite artists, albums, or singers, and the system analyzes this input to generate personalized song recommendations. By leveraging natural language processing (NLP) and advanced recommendation algorithms, chatbots create a user-centric approach to music discovery. They seamlessly integrate with user preferences, offering a delightful journey through the diverse world of music.
- **Emotion-Based Recommendations:** Some chatbots analyze the emotional tone of user chats and recommend songs based on the detected emotion. For example, if a user expresses sadness, the chatbot suggests calming or uplifting songs. By identifying emotions in user interactions, these systems provide tailored playlists that resonate with the user's mood.
- **Encouraging Exploration:** Beyond personalized recommendations, chatbots introduce users to related genres or emerging artists within their chosen preferences. By encouraging exploration, chatbots help users discover new music beyond their usual favourites.
- **Hybrid Models:** Some chatbot song recommendation systems combine collaborative filtering with content-based filtering to refine suggestions. Hybrid models offer a balanced approach, considering both user history and song characteristics to generate relevant recommendations.

CHAPTER 2

BACKGROUND AND RELATED WORK

2.1 Problem Statement:

Building an effective chatbot song recommendation system involves addressing NLU challenges, personalizing recommendations, detecting emotions, and balancing exploration and exploitation. The ultimate goal is to create a delightful music discovery experience for users.



2.2 Background Related Work:

Chatbot technology refers to artificial intelligence (AI) systems that can engage in natural language conversations with users. In the context of recommender systems, chatbots enable users to interact with the system using natural language queries and receive personalized recommendations in a conversational manner. Chatbots can enhance the user experience by providing a more intuitive and engaging interface for interacting with recommendation systems. Key aspects of chatbot technology in recommender systems include:

Natural Language Processing (NLP): Chatbots utilize NLP techniques to understand and interpret user queries expressed in natural language. NLP enables chatbots to extract relevant information from user inputs and generate appropriate responses.

Conversational Interfaces: Chatbots provide users with conversational interfaces, allowing them to interact with the recommendation system through text-based or voice-based conversations. This conversational approach enhances user engagement and facilitates a more personalized recommendation experience.

Personalization: Chatbots leverage user interactions and preferences to deliver personalized recommendations tailored to individual tastes. By incorporating user feedback and contextual information, chatbots can adapt their recommendations to meet the evolving needs and preferences of users.

2.3 Literature Survey:

Most mainstream audio and video recommender systems, such as Spotify, Netflix, Gaana, and YouTube, predominantly rely on search queries and user preferences, often overlooking the emotional aspect of user needs. However, a novel CNN- based model has been proposed to address this gap by detecting emotions and generating playlists tailored to the user's emotional state. This innovative model integrates specialized modules designed for detecting emotions conveyed through facial expressions as well as sentiments expressed during interactions with a chatbot. By incorporating these modules, the model enhances the overall performance and robustness of the music recommender system, ensuring that users' emotional needs are effectively met. A human emotion recognition system is proposed, utilizing 2D-Linear Discriminant Analysis (LDA) embedded with 2D. Principal Component Analysis (PCA). Simulated results indicate that this method surpasses its counterparts, namely 2D-LDA and 2D-PCA, when employed for feature extraction.

The KNN classifier demonstrates better performance compared to SVM when used with our proposed feature extraction method. A chatbot is an AI-powered computer program that engages in conversations with humans, typically through messaging platforms.

This schema explores the application of Artificial Intelligence and Machine Learning advancements to enhance various services. The chatbot program utilizes WordNet to match the input statement with the closest matching response and selects a suitable response from a known set of statements. The project's objective is to implement an online chatbot system that assist users accessing a college website, leveraging AI techniques such as Natural Language Processing.

CHAPTER 3

DESIGN

3.1 BLOCK DIAGRAM

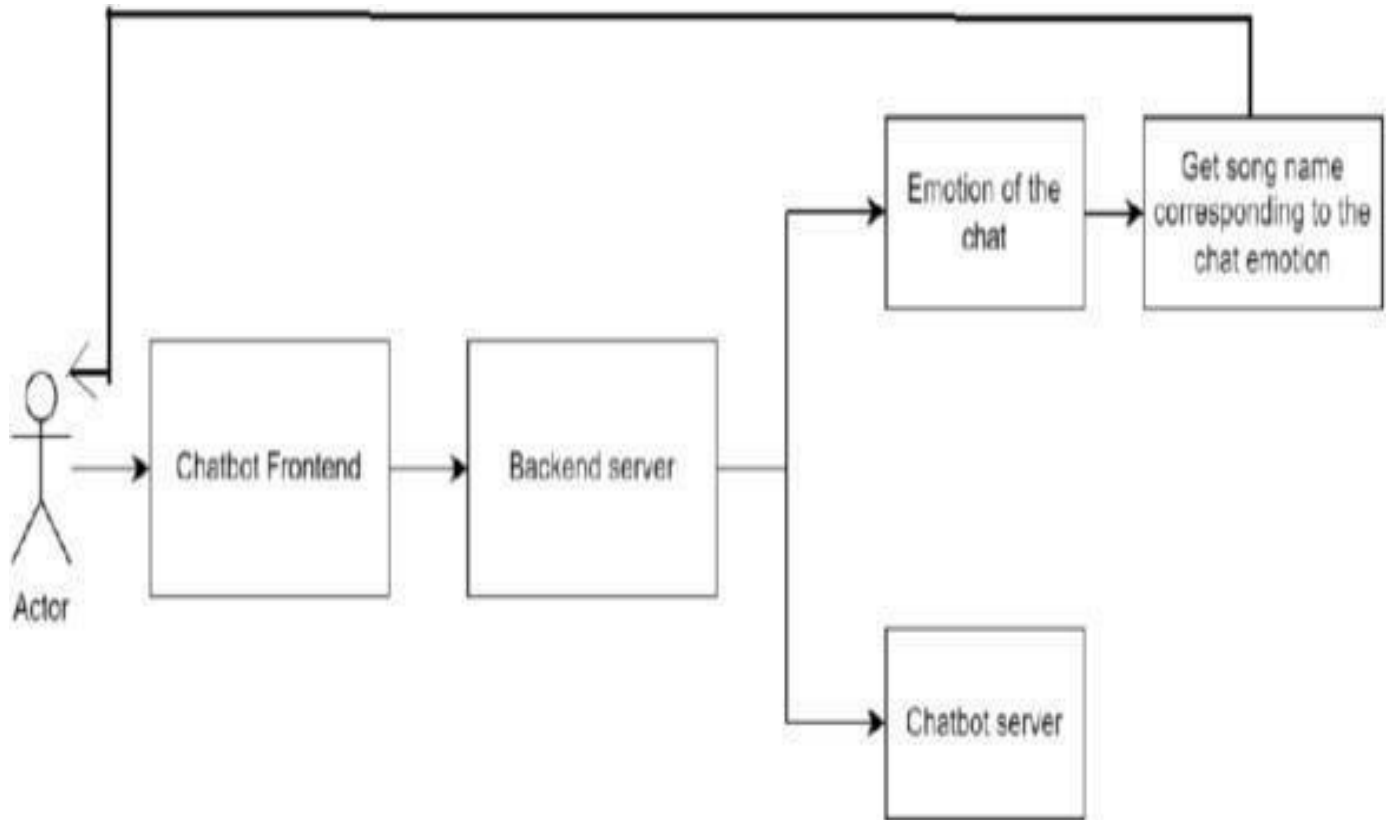


Fig 3.1: Block diagram of our project

3.2 Flowchart Diagram

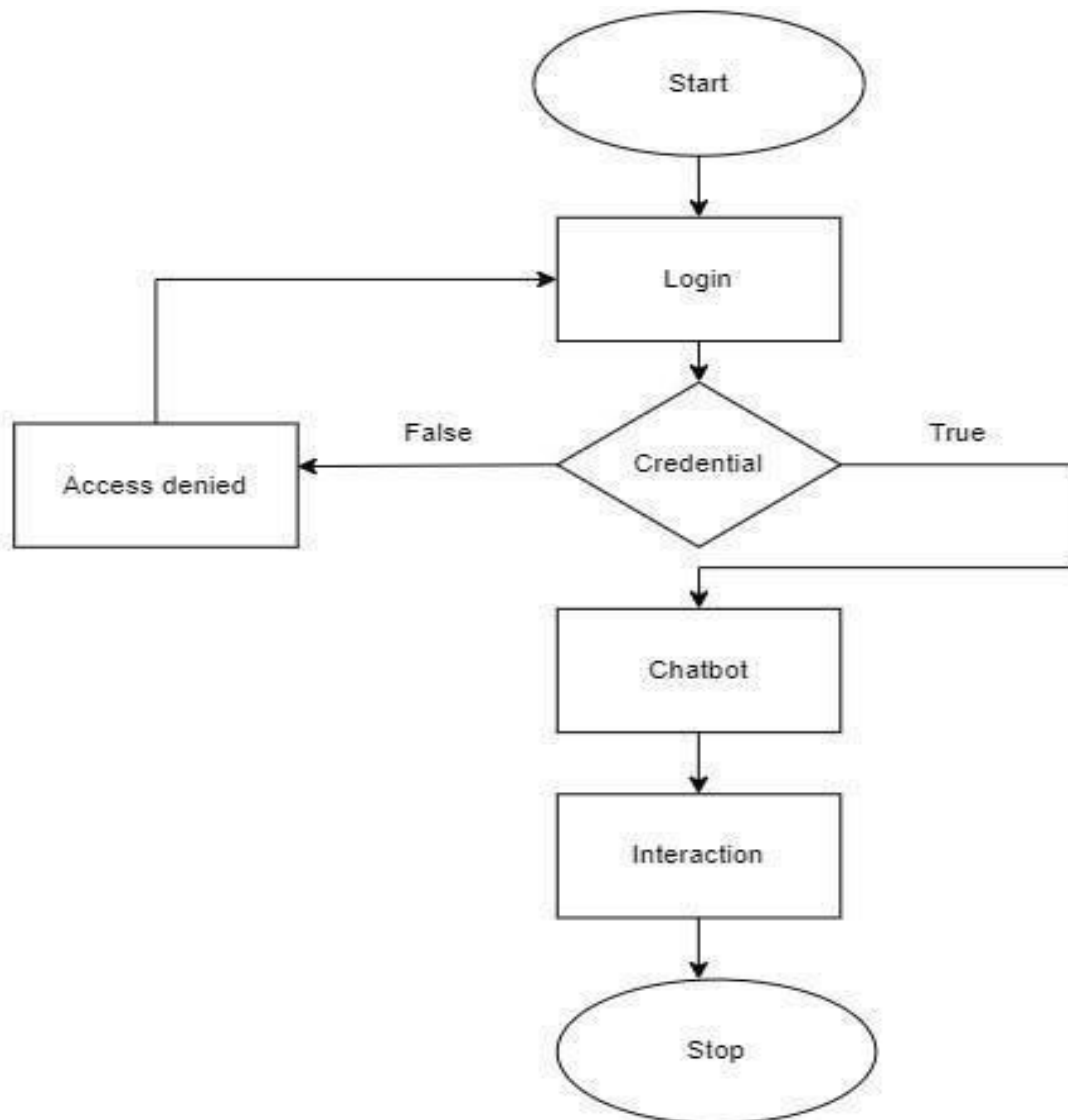


Fig 3.2: Flowchart of our project

3.3 Architectural Diagram

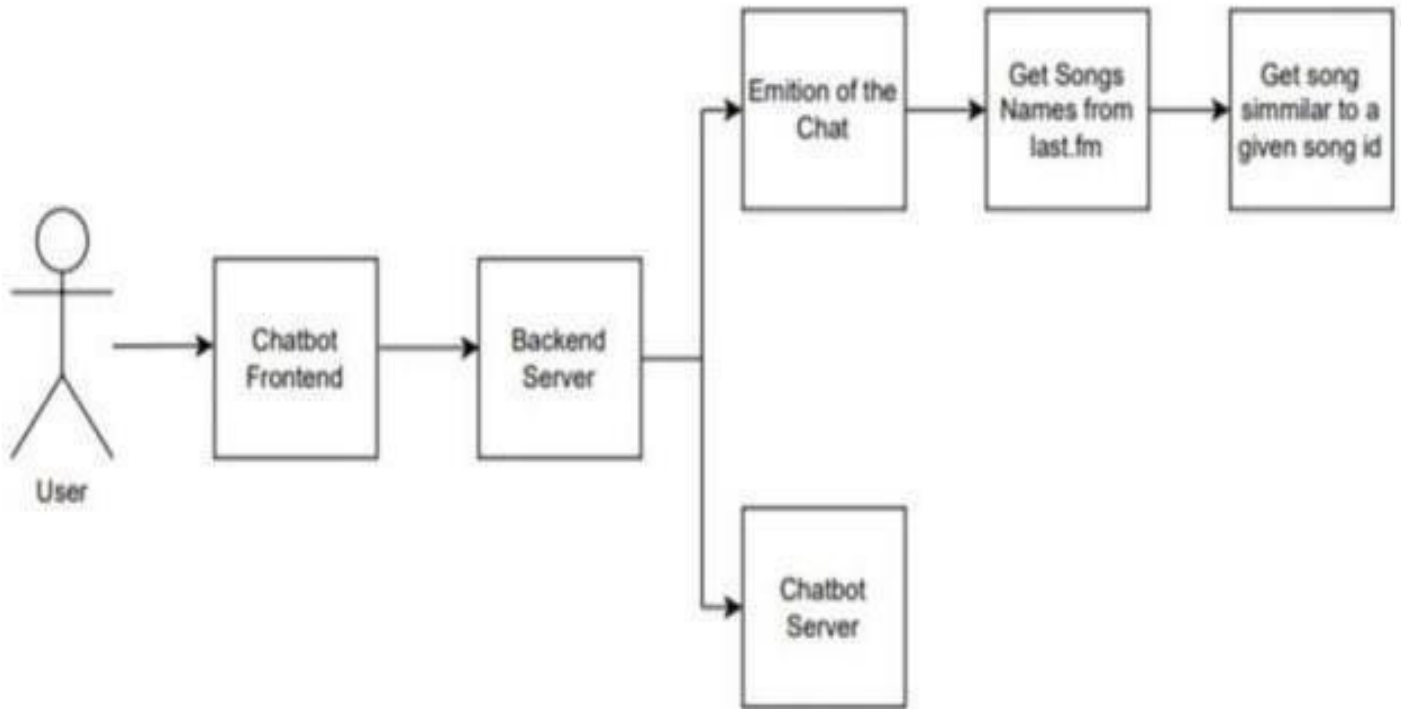


Fig 3.3: Architectural diagram of our project

CHAPTER 4

IMPLEMENTATION

4. Technology and Working

A Python script for creating a music recommender chatbot using several libraries and frameworks.

Libraries and Modules Used:

random: This module provides functions for generating random numbers, which could be useful for selecting random songs or recommendations.

tkinter: A Python library for creating graphical user interfaces (GUIs). In this code, it's used to create the chatbot interface.

pygame: A library for handling multimedia tasks, such as playing audio files. It's likely used for playing music recommendations.

PIL (Python Imaging Library): Used for image processing, including loading and displaying images.

os: Provides operating system-related functions. It's not explicitly used in the code snippet you provided, but it's a common library for file and directory operations.

pyttsx3: A text-to-speech conversion library. It's used for converting text responses into speech.

speech_recognition: Used for speech recognition, which could allow users to interact with the chatbot using voice commands.

Class MusicRecommenderBot:

This class represents the music recommender chatbot.

The **__init__** method initializes the chatbot by setting up the GUI, audio playback, and other necessary components.

The **create_widgets** method creates the chat history display, user input field, and image display.

The **setup_music_database** method is not shown in the snippet, but it would likely involve loading music data (e.g., song titles, artists, genres) for recommendations.

Image Display:

The code attempts to load and display an image from the path specified in `image_path`. However, the actual image file is not included in the snippet, so we can't see what it looks like.

Text-to-Speech and Audio Playback:

The chatbot uses **pyttsx3** for text-to-speech conversion. When the chatbot responds, it can convert the text response into speech.

pygame is initialized for audio playback. This suggests that the chatbot might play music recommendations for the user.

Overall Purpose:

The goal of this code is to create an interactive chatbot that recommends music to users based on their input. Users can type queries, and the chatbot responds with music recommendations or other relevant information.

CHAPTER 5

PROJECT PLAN

5. Project Plan

Evaluation methodology is crucial for assessing the performance and effectiveness of a chatbot-based song recommendation system. It involves defining metrics, designing experiments, collecting data, and analyzing results to measure various aspects of the system's performance. Measure the accuracy of song recommendations by comparing recommended songs with songs liked or interacted with by users in a test dataset. Calculate precision and recall metrics to evaluate the relevance and coverage of recommended songs compared to users' preferences. Gather user feedback through surveys or ratings to assess overall satisfaction with the recommendation system and user experience. Track user engagement metrics such as session duration, interaction frequency, and click-through rates to measure user engagement with the chatbot. Evaluate the novelty and diversity of recommended songs to ensure that the system introduces users to new and diverse music content. Split the dataset into training, validation, and test sets to train and evaluate the recommendation algorithms. Design experiments to evaluate the performance of different recommendation algorithms, including collaborative filtering, content-based filtering, hybrid approaches, and deep learning models. Define experimental conditions, such as user demographics, interaction scenarios, and evaluation criteria, to ensure comprehensive testing of the recommendation system. Collect data on user interactions, preferences, and feedback through the chatbot interface during the evaluation period. Use anonymized user data to maintain user privacy and confidentiality while ensuring sufficient sample size for meaningful analysis. Collect ground truth data on user preferences and interactions through surveys, user ratings, or manual annotations to evaluate the accuracy of recommendation algorithms. Analyze the performance of recommendation algorithms based on evaluation metrics, experimental conditions, and user feedback.

Compare the performance of different algorithms and variations to identify strengths, weaknesses, and trade-offs. Conduct statistical analysis to assess the significance of differences in performance metrics between experimental conditions or algorithms. Interpret results in the context of user preferences, system requirements, and practical implications for deployment. Iterate and Improve Incorporate insights from the evaluation results to iteratively improve the recommendation system, algorithm performance, and user experience. Address any identified shortcomings, biases, or limitations in the evaluation methodology or experimental design. Continuously monitor and evaluate the system's performance over time, incorporating user feedback and adapting to evolving user preferences and needs.

CHAPTER 6

PROJECT SCREENSHOT

GIGGLE - Music Recommender Chatbot

— □ ×



User: hi

GIGGLE: Hello! GIGGLE this side, How can I assist you today?

User: giggle i am feeling joyfull today please play the songs according to the mood

GIGGLE: happy

Send

Voice

The interface of the Chatbot Song Recommendation System (GIGGLES)

CHAPTER 7

CONCLUSION & FUTURE SCOPE

7.1 Conclusion

Proving human identity and significance and their affect to, among others, technology and psychological, persona has been the framework. Emotions are indeed winning the game as they play the role of signposts in manifesting an individual's mental state qualities which have a great impact on their actions and in their reasoning processes. Harmonizing emotions in the machines induces new directions for humanity such as personalized and empathetic assistance to the users.

The purpose of this paper is to use the given access to technology for the listener to feel better. This thing is to recommend music based on the emotional state of the user. The music has been acknowledged as a potent tool of the emotional-affective sphere, and large-scale research provides further evidence of its efficacy on the human brain function. The main goal of the system is to provide the user with music that is suited to their emotional condition, through such a move it is possible to use music to improve the user's experience as well as well-being.

The utilization of a chatbot supported by artificial intelligence empowering it to interpret users' feelings is a novel way of influencing emotional aspects of users. Chatbots, thanks to their skill in detecting sentiment of speech, can do the same job via text input with accuracy. Using the algorithms created for the understanding of mood or sentiment of the language, the chatbot can play music that is in sync with the user's mood right now or a music that he may prefer.

Besides that, the chatbot's talent in storage and dealing with user input allows, therefore, for the building of the data over time and the system can make the correction of its recommendations based on the past interactions. This iterative process of learning boosts the system's efficiency in properly recognizing and responding to the users' emotional states, influencing the positive user experience.

In reflection, adding emotion recognition component to music recommendation systems development is the game-changer in what users will experience music going forward. This particular method of recommendation is achieved via AI and chatbot technology. Through these technologies, it offers a personalized and sympathetic approach to suggest music that goes well with the users' moods.

7.2 Future Scope

The "Chatbot Song Recommendation System" project lays a solid foundation for future advancements and expansions, offering numerous opportunities for further development and innovation.

1. **Advanced Emotion Recognition Techniques:** Try to use cutting-edge technologies like facial recognition, voice, and biometric sensors to enhance the accuracy and the amount of the detected emotions.
2. **Real-Time Emotion Tracking:** Put in place a kind of feedback system that is able to change music suggestions on its own, making use of facial expressions, voice tone, and physiological responses real-time changes, in order to offer continuous monitoring of all those parameters.
3. **Context-Aware Recommendations:** Use contextual data (eg, time of day, location, and user activities) to offer a more suitable and situation-specific music advice that matches the user's circumstances.
4. **Multimodal Interaction:** Enlarge the system to manipulate more input channels mainly written, verbal, and gestural ones in order to discover more features of emotions and users should also be involved.
5. **Personalized Music Generation:** Investigate generation of user custom music soundtracks which will be created based on the user's emotional regime by using AI model for music generations and an adaptive music method.
6. **Integration with Wearable Devices:** Adopt biometric measurement via wearable technologies towards uninterrupted monitoring of emotions and allowing feedback loops, enabling users to be aware of their emotion state throughout the day.
7. **User Feedback and Iterative Improvement:** Build an interface for collecting the user data, where users can provide the feedback and the algorithm will be working on the problem till it will improve the system performance and meet the user requirements

These achievements are primed to be the key to the reformation of emotion-aware music recommendation systems, where people can have a more engaging and great music listening experience.

Bibliography

1. Kajornsak Kittimathaveenan, Chanathip Pongskul, Salisa Mahatanarat “Music Recommendation Based on Color” IEEE Xplore ISBN:978-1-7281-9978- 8/20/31.00 October 20, 2020.
2. Zijing Gao, Lichen Qiu, Peng Qi, Yan Sun “A Novel Music Emotion Recognition Model for Scratch generated Music” IEEE Xplore August 01, 2020.
3. Krupa K S, Ambara G, Kartikey Rai, Sahil Choudhury “ Emotion aware Smart Music Recommender System using Two Level CNN” IEEE Xplore Part Number: CFP20P17 - ART; ISBN: 978-1-7281-5821-1.
4. Yucheng Jin, Wanling Cai, Li Chen, Nyi Nyi Htun, Katrien Verbert “MusicBot: Evaluating Critiquing-Based Music Recommenders with Conversational Interaction” CIKM '19, November 3–7, 2019.
5. Mohammad Nuruzzaman, Omar Khadeer Hussain “A Survey on Chatbot Implementation in Customer Service Industry through Deep Neural Networks” IEEE Xplore October 2018.
6. Guruswami Hiremath, Aishwarya Hajare, Priyanka Bhosale, Rasika Nanaware, Dr . K. S. Wagh “Chatbot for education system” ISSN: 2454-132X 2018.
7. K. Jwala, G.N.V.G Sirisha, G.V. Padma Raju “Developing a Chatbot using Machine Learning” ISSN: 2277-3878, Volume-8 Issue-1S3, June 2019.
8. Amaan Shaikh, Bhushan Patil, Tejas Sonawane “ A Machine Learning Based Chatbot Song Recommender System” JETIR December 2021.
9. Shoaib Kamal, Dr.Farrukh Sayeed, MohammedRafeeq “ Facial Emotion Recognition for Human Computer Interactions using hybrid feature extraction technique” IEEE Xplore 12 December 2016.
10. Dr. G S. Bapiraju A Archana, A. Rasagna B. Abhinaya, Roshini Guptha “ Song Recommender System via Chatbot” ISSN: 2582 - 3930 May – 2022.

Thank you