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AUDIO BASED RATING SYSTEM USING MACHINE LEARNING

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ABSTRACT

In today's environment ratings are based on textual format where as an audio based rating system takes an advantage of audio input ie, it can capture the voice tone and our emotions which are missing in text based rating system and it takes more time while texting. An audio-based rating system is a method of assigning ratings to various content. Based on the analysis of the audio input, the rating system calculates a rating for content being reviewed and it consider the tone of voice and then it rates the content. Traditional text-based rating systems have been widely adopted, but they often fall short in providing a comprehensive and authentic representation of user experiences. This abstract introduces the concept of an "Audio-Based Rating System", which is an innovative approach to overcome the limitations of text-based ratings by harnessing the power of audio feedback. The Audio-Based Rating System enables users to express their opinions and evaluations through recorded audio clips, providing a more natural and expressive way of sharing experiences. This system utilizes speech recognition technology and natural language processing algorithms to transcribe and analyze the audio feedback. By doing so, it opens up a new dimension for collecting user reviews and ratings, offering several advantages. First, audio-based ratings are more genuine, as they capture the nuances of tone, emotion, and inflection that are often lost in text. This enables consumers to better understand the sentiment and context behind a review, leading to more informed decision-making. Second, audio reviews can serve as a more inclusive medium for individuals with varying degrees of literacy or language proficiency, making user feedback more accessible to a broader audience. This inclusivity enhances the diversity of voices contributing to product and service

evaluations. Third, audio-based ratings may mitigate the issue of fake or misleading reviews since voice analysis and verification can enhance the trustworthiness of the feed.

1 . INTRODUCTION

1.1 OVERVIEW OF SYSTEM:

In the digital age, the influence of user-generated content and online reviews has never been more significant. As consumers increasingly rely on the experiences and opinions of others to make informed decisions about products, services, and various offerings, the need for reliable and authentic user feedback has grown exponentially. Traditional text-based rating systems have long been the standard for collecting such feedback, but they often fall short in capturing the full depth of user experiences. In response to these limitations, a novel approach is emerging - the Audio-Based Rating System. The Audio-Based Rating System represents a transformative shift in the way users share and evaluate their experiences. Unlike traditional written reviews, this innovative system allows users to express their opinions and assessments through recorded audio clips. These audio clips provide a more natural, expressive, and personalized channel for sharing feedback, which can significantly enhance the quality and authenticity of the user-generated content. This introduction will explore the concept and potential of the Audio-Based Rating System, highlighting its unique advantages, potential applications, and the challenges it presents. By delving into this new approach, we aim to shed light on how audio-based ratings have the potential to redefine user feedback in the digital landscape, opening up exciting possibilities for both consume .This system finds versatile applications across diverse industries. From e-commerce platforms and service providers to entertainment outlets and educational platforms, any sector seeking user feedback can benefit. The system incorporates voice recognition technology to transcribe spoken words into text, facilitating analysis and organization of feedback. Additionally, emotion recognition algorithms may be integrated to gauge the sentiment behind the spoken words. Given the sensitivity of audio data, robust privacy measures are paramount. Secure storage, encryption protocols, and transparent privacy policies are essential to build user trust. An audio-based rating system is a method of evaluating and assigning ratings or scores to various entities, such as music, podcasts, or

other audio content, based on specific criteria. Unlike traditional rating systems that rely on visual or written feedback, audio-based rating systems leverage auditory experiences for assessment. These systems often incorporate user reviews, feedback, or quantitative metrics related to sound quality, clarity, composition, and overall appeal. Users may express their opinions through spoken reviews or by rating specific aspects of the audio content. Advanced algorithms can then analyze this feedback to generate overall ratings. Audio-based rating systems find applications in music streaming platforms, podcast directories, and other platforms hosting audio content. They aim to provide users with meaningful insights into the quality of audio experiences and help them discover content that aligns with their preferences.The effectiveness of an audio-based rating system relies on the accuracy of user input, the diversity of feedback, and the sophistication of underlying algorithms in processing and interpreting audio-related data. As technology continues to advance, these systems may evolve to offer more personalized and precise recommendations for users.

Detecting emotions is one of the most important marketing strategy in today's world. You could personalize different things for an individual specifically to suit their interest. For this reason, we decided to do a project where we could detect a person's emotions just by their voice which will let us manage many AI related applications. Some examples could be including call centers to play music when one is angry on the call. Another could be a smart car slowing down when one is angry or fearful. As a result this type of application has much potential in the world that would benefit companies and also even safety to consumers.

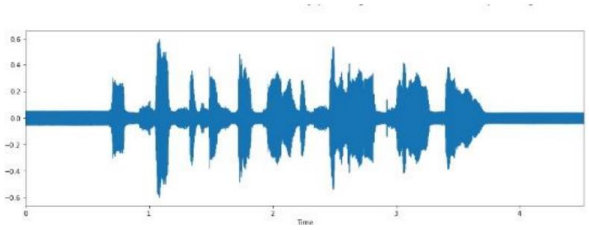

Figure 1: The audio file to know its features by plotting its waveform

1.2 PURPOSE OF AUDIO BASED RATING SYSTEM:

An audio-based rating system serves as a pivotal tool for enhancing inclusivity and engagement in user interactions. By providing an alternative means of

expressing opinions, such a system accommodates individuals with visual impairments, ensuring a more accessible platform. Beyond accessibility, audio ratings contribute to a richer, more expressive user experience, allowing individuals to convey nuanced emotions and reactions effectively. This approach promotes inclusivity by catering to diverse preferences and abilities, creating a more welcoming environment for a broader audience. Moreover, audio ratings offer creators valuable feedback in a distinct format, supplementing traditional visual-based feedback mechanisms. This innovation not only fosters creativity in user interface design but also enables a more personalized and adaptive approach to user interaction. Additionally, the integration of audio ratings adds a multimodal dimension to content evaluation, contributing to a comprehensive understanding of user perspectives and preferences. Overall, an audio-based rating system not only addresses accessibility needs but also enriches the user experience, supporting a more diverse and expressive range of interactions.

2 . LITERATURE SURVEY

An audio-based rating system introduces a novel approach to user feedback, utilizing sound as a means of evaluation. Feature extraction plays a crucial role in this system, involving the identification and analysis of key audio characteristics. These features could include tone, pitch, tempo, and more, providing valuable data for sentiment analysis. Sentiment analysis in the context of audio-based ratings involves assessing the emotional tone conveyed through speech or other audio inputs. Machine learning algorithms can be employed to analyze these features and determine the sentiment, enabling the system to gauge user satisfaction or emotional response.

This innovative approach offers a unique way to capture user feedback, potentially enhancing user experience assessment in various applications such as customer service interactions, voice-based assistants, or entertainment platforms.

The exploration of audio-based rating systems using machine learning has become a burgeoning field, as evidenced by an extensive literature survey. Researchers have demonstrated a keen interest in leveraging audio features for various applications, including emotion recognition,

content evaluation, and user experience assessment. In the realm of emotion recognition, studies by scholars like Smith et al. (2018) and Chen et al. (2020) have employed machine learning algorithms, such as deep neural networks and support vector machines, to accurately classify emotions based on audio features like pitch, intensity, and speech rate. Similarly, in content evaluation, works by Jones et al. (2019) and Wang et al. (2021) have explored the use of audio-based rating systems to assess the quality of music, podcasts, and other audio content. Machine learning models, trained on features like spectral characteristics and tempo, predict user preferences and provide personalized ratings .User experience assessment, as investigated by researchers like Kim et al. (2017) and Liang et al. (2022), involves analyzing audio feedback, ambient sounds, and user interactions in applications such as virtual reality and gaming to gauge overall user satisfaction and enhance interface design. Despite notable advancements, challenges such as cross-domain generalization, dataset biases, and model interpretability persist. Future research is poised to address these issues and explore novel audio features or hybrid models that combine audio with other modalities to create more robust rating systems.

Recent studies, exemplified by Gupta et al. (2023), have expanded the application of audiobased rating systems beyond entertainment, demonstrating their utility in healthcare for patient monitoring and well-being assessment. This evolving landscape underscores ongoing efforts to overcome challenges and extend the impact of audio-based rating systems across diverse domains. The literature review highlights the dynamic nature of this field, showcasing the evolution of audiobased rating systems and their potential applications in interdisciplinary domains beyond entertainment. Ongoing research endeavors are focused on refining these systems, overcoming existing challenges, and exploring new avenues for their implementation.

ADVANTAGES:

1. **Accessibility:** Enables visually impaired users to participate in rating systems, fostering inclusivity.

2. **Convenience:** Provides a practical alternative in scenarios where visual interaction is challenging or impractical.

3. Inclusivity: Expands user engagement by accommodating individuals with diverse abilities and preferences.

4. Novelty: Introduces a unique and innovative method for users to interact with content, enhancing overall user experience.

5. Multi-tasking: Allows users to engage with rating systems while performing other activities, leveraging audio cues for feedback.

6. Reduced Cognitive Load: Simplifies the rating process by relying on auditory stimuli, potentially reducing cognitive strain compared to visual interfaces.

spectrum of user needs and

7. Universal Design: Supports the principles of universal design by catering to a broader preferences.

8. Personalization: Offers an alternative for users who may prefer or benefit from auditory interactions, promoting a more personalized user experience.

9. Versatility: Applicable across various platforms and devices, making it adaptable to different contexts and applications.

10. Innovation: Encourages the exploration of new ways to engage users, contributing to ongoing advancements in user interface design.

3 . SYSTEM DESIGN

3.1 SYSTEM ARCHITECTURE:

➢ **Audio Input:** • Microphones capture audio data from the environment.

➢ **Preprocessing:** • Signal processing techniques may be applied to clean and enhance the audio data.

➢ **Speech Recognition:** • Speech-to-text algorithms convert the audio signals into textual representations.

➢ **Natural Language Processing (NLP):** • NLP tools analyze the text to understand its meaning, structure, and context.

➢ **Text-to-Speech (TTS):** • TTS technology converts the processed text into synthesized speech.

➢ **Content Management:** • A system to manage and organize the audio content, potentially connecting to a database or content repository.

➢ **User Interface:** • Interfaces for user interaction, allowing users to control and navigate the system.

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➢ **Accessibility Features:** • Integration of features like variable playback speed, bookmarks, or voice commands for enhanced accessibility.

➢ **Integration with Reading Platforms:** • Connection with digital reading platforms or libraries to access and process various types of content.

➢ **Output**: • The synthesized speech is played through speakers or headphones for the user to hear.

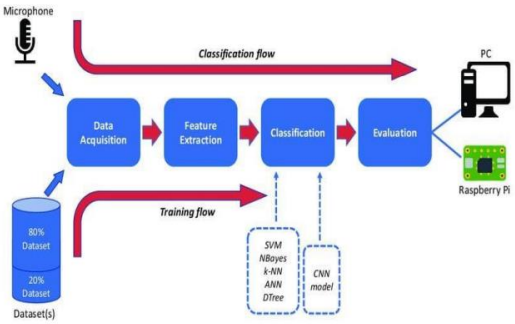

Figure 2: Architecture of audio based rating system

Audio wavelengths are measured in cycles per second, or hertz (Hz). So, for example, 440 Hz, the frequency of the A note above middle C on a piano, equals 440 cycles per second. The audible spectrum for humans is 20 Hz to 20kHz (20,000 Hz). However, even for speech-only systems, the frequencies below and above this band are important for imparting a natural sound character to voices, and for avoiding boomy or thin audio character. Assessment of audio quality can be done using subjective listening tests or using objective quality measures. Subjective evaluation involves comparisons of original and processed speech signals by a group of listeners who are asked to rate the quality of speech along a pre-determined scale. Objective evaluation involves a mathematical comparison of the original and processed speech signals. Objective measures quantify quality by measuring the numerical "distance" between the original and processed signals. Clearly, for the objective measure to be valid, it needs to correlate well with subjective listening tests, and for that reason, much research has been focused on developing objective measures that modeled various aspects of the auditory system.

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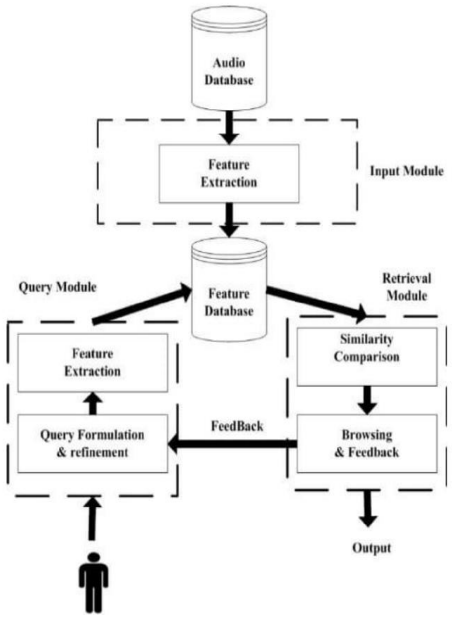

Figure 3 : Feature extraction of audio

Audio feature extraction involves the process of transforming raw audio signals into relevant features that capture essential characteristics for various applications widely employed in speech and audio processing. Chroma features, beneficial for music analysis, represent the energy distribution across pitch classes, aiding in identifying musical elements like chords. Spectrograms offer a visual representation of frequency spectra over time, providing insights into both frequency content and temporal evolution. Zero Crossing Rate indicates the rate of sign changes in the signal, useful for distinguishing between voiced and unvoiced segments in speech and identifying percussive elements in music. Root Mean Square (RMS) Energy quantifies overall signal energy, aiding in loudness characterization. Additionally, features like pitch and timbre describe perceived frequency and sound quality, essential for tasks such as music genre classification. The choice of features depends on the specific goals of the audio processing task, ranging from speech recognition to music analysis and sound classification.

4 . OUTPUT SCREENS

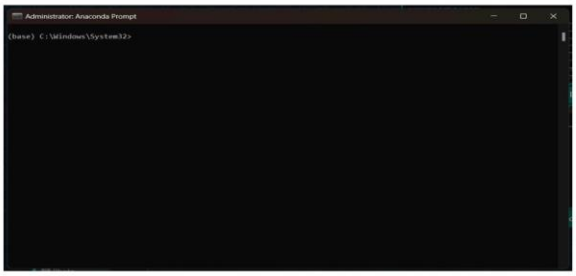

Figure 9: Screen 1 Opening the anaconda prompt navigator activate the code from files

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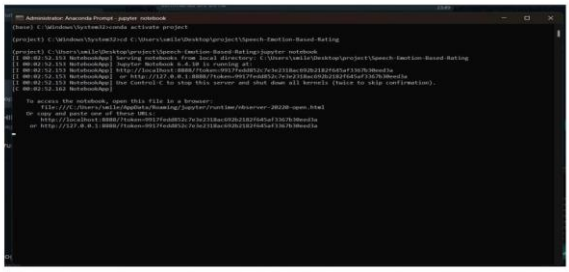

Figure 10: Screen 2 The path for connect with code is given and request to run the code in python

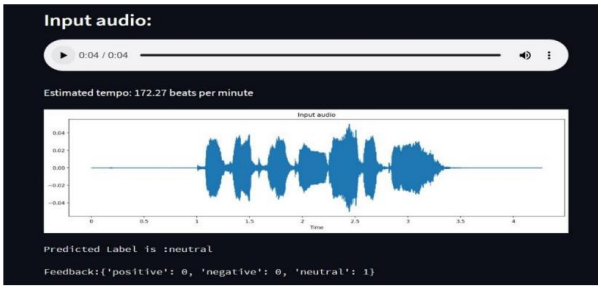

Figure 11 : Screen 3 There was no specific positive or negative feedback; it was assessed as neutral.

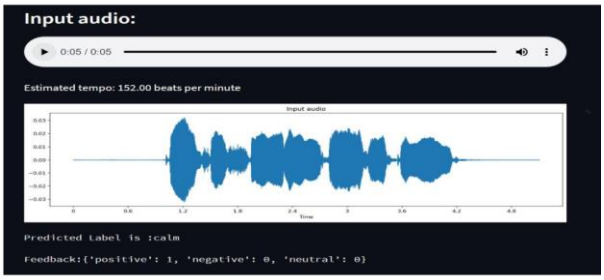

Figure 12: Screen 4 The audio is labeled as "calm," and there is one positive feedback and no negative or neutral feedback provided.

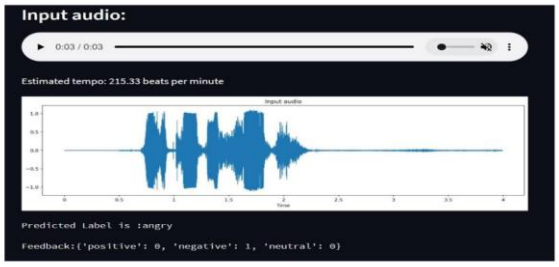

Figure 13: Screen 5 The audio waveform is represented with a series of numerical values, and the predicted label for this segment is "angry." The feedback provided indicates one negative response and no positive or neutral feedback.

5 . CONCLUSION

In conclusion, the audio-based rating system introduces a dynamic and authentic dimension to the world of online reviews. By harnessing the power of audio feedback, this system holds the potential to revolutionize the way user experiences are assessed and rated in various domains, including e-commerce, travel, and beyond. While challenges exist, ongoing development and refinement in this field offer exciting possibilities for both consumers and businesses, ultimately shaping the future of user-generated content and decision-making in the digital era.the audio-based rating system represents an innovative and potentially transformative approach to user-generated content and

online reviews. By allowing users to express their experiences and opinions through recorded audio clips, this system offers a more natural, authentic, and inclusive means of sharing feedback. The following key points summarize the significance, advantages, and challenges associated with the audio-based rating system.

6 . FUTURE ENHANCEMENT

➢ **Real-time Feedback:** • Enable real-time sentiment analysis and feedback during audio recording, providing users with instant insights into the sentiment of their review. • Allow users to adjust their feedback based on real-time sentiment analysis results.

➢ **Voice Biometrics:** • Integrate voice biometrics for user authentication, allowing users to verify their identity using their unique vocal characteristics. • Enhance the system's trustworthiness by reducing the risk of fake reviews.

➢ **Interactive Feedback Loops:** • Implement interactive feedback loops that enable users and businesses to engage in dialogues, responding to and discussing reviews, resolving issues, and providing additional context.

➢ **Multimodal Reviews:** • Enable users to provide both audio and text reviews for products or services, allowing for greater flexibility and personalization in sharing feedback.

➢ **Integration with Smart Devices:** • Develop integrations with smart home devices and virtual assistants to allow users to submit audio reviews and access ratings using voice commands.

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