AUTOMATIC PRONOUNCIATION MISTAKE DETECTOR

ABSTRACT WORD

A tool that corrects pronunciation errors can be called Pronounce Master or Speak Perfect. These names suggest a high level of proficiency in pronunciation. Other options include Voice Guide or Pronunciation Helper. These names are straightforward and convey the tool's purpose. They help users understand what the tool does and what benefits it offers. A simple and memorable name can make the tool more appealing to users. It can also make it easier for people to find and use the tool. This can lead to more downloads and user engagement always.

INTRODUCTION

MOTIVATION: This project aims to help language learners and non-native speakers improve their pronunciation skills. By developing an automatic pronunciation mistake detector, we can provide users with instant feedback and correction, enhancing their learning experience. The tool can also assist teachers in identifying areas where students need improvement, making language learning more effective and efficient. Ultimately, the goal is to empower users to communicate confidently and accurately in their target language.

SCOPE:

1. Pronunciation Analysis: The tool will analyze user audio input to detect pronunciation errors, including but not limited to:

- Phoneme-level errors
- Word-level errors
- Sentence-level errors

2. Feedback Mechanism: The tool will provide instant feedback to users on their pronunciation errors, including:

- Error detection and highlighting
- Correction suggestions
- Pronunciation tips and advice

3. User Interface: The tool will have a user-friendly interface, accessible via web or mobile platforms, allowing users to:

- Record and submit audio input
- View feedback and correction suggestions
- Track progress and improvement over time

4. Accuracy and Reliability: The tool will strive to achieve high accuracy and reliability in detecting pronunciation errors, using advanced speech recognition and machine learning algorithms.

OBJECTIVES:

1. **Improve Pronunciation Skills:** To help language learners and non-native speakers improve their pronunciation skills by providing instant feedback and correction.

2. Enhance Language Learning: To enhance the language learning experience by identifying and addressing

pronunciation errors, making language acquisition more effective and efficient.

3. Increase Confidence: To empower users to communicate confidently and accurately in their target language, reducing anxiety and self-consciousness related to pronunciation.

4. Support Language Teachers: To assist language teachers in identifying areas where students need improvement, making classroom instruction more targeted and effective.

5. Develop Advanced Technology: To develop and apply advanced speech recognition and machine learning algorithms to improve pronunciation analysis and feedback.

LITERATURE SUMMARY

RELATED STUDIES:

- Deep Learning Approaches:

- Automated Detection of Pronunciation Errors in Non-Native English Speech Employing Deep Learning: This study achieved a 30% improvement in AUC over previous methods, demonstrating accuracy in detecting mispronunciations using the WEAKLY-S model.

- Analysis of Mispronunciation Detection and Diagnosis Based on Deep Learning Techniques: This research explores the use of deep learning frameworks for automatic speech scoring and pronunciation error detection [1] [2].

- Speech Recognition Technology:

- Design of an Automatic English Pronunciation Error Correction System Based on Radio Magnetic Pronunciation Recording Devices: This study proposes a system that uses automatic speech recognition technology to detect incorrect phoneme pronunciations and generate an extended pronunciation lexicon.

- Automatic Error Detection in Pronunciation Training: Where we are and where we need to go: This study reviews research on automatic pronunciation error detection over the past 10-15 years, highlighting the need for further development of algorithms.

- Mispronunciation detection and diagnosis using deep neural networks: a systematic review:

This systematic review explores the use of deep neural networks for mispronunciation detection and diagnosis [7].

INCOMPLETENESS:

1. **Limited Language Support:** The tool might not support all languages or dialects, potentially limiting its usefulness for users who speak less common languages.

2**. Insufficient Training Data:** The tool's accuracy might be compromised if the training dataset is limited or biased, leading to incomplete or inaccurate pronunciation analysis.

3. Lack of Contextual Understanding: The tool might struggle to understand the context of pronunciation errors, potentially leading to incorrect or incomplete feedback.

4. Inadequate Error Detection: The tool might not detect all types of pronunciation errors, such as prosody or intonation errors, which could limit its effectiveness.

5. Limited Feedback Mechanisms: The tool's feedback mechanisms might not be comprehensive or user-friendly, potentially limiting its usefulness for users.

6. Incompatibility with Various Accents: The tool might not be able to handle diverse accents or speaking styles, which could lead to incomplete or inaccurate analysis.

PROJECT OF WORK

PROCESS OF TECHNIQUES:

1. **Creating a Recording Interface**: Using HTML5 audio elements to allow users to record their pronunciation.

2. **Uploading Audio :** Creating a interface for users to upload audio .

3. **Displaying Pronunciation Feedback:** Using HTML to display feedback on pronunciation errors, such as highlighting incorrect words or phrases.

4. **User Progress Tracking**: Creating a dashboard or progress tracker to show users their improvement over time.

5. **Providing Correct Pronunciation Examples:** Using HTML audio elements to provide examples of correct pronunciation for users to reference.

6. Error Highlighting: Using HTML and CSS to highlight specific words or phrases that were pronounced incorrectly.

RESULT AND REPORT ANALYSIS

OBTAINED RESULT:

1. **Accuracy Rate:** The percentage of correctly detected pronunciation errors.

2. **Error Detection Rate:** The percentage of actual pronunciation errors detected by the system.

3. **False Positive Rate:** The percentage of incorrectly identified pronunciation errors.

4. User Improvement: Measurable improvement in users' pronunciation skills over time.

5. User Satisfaction: Feedback from users on the effectiveness and usability of the system.

ANALYSIS OF RESULT:

1. **Qualitative Analysis**: Analyzing user feedback and comments to understand the system's strengths and weaknesses.

2. Comparison to Benchmarks: Comparing the system's performance to established benchmarks or human evaluation to assess its reliability.

3. Error Analysis: Analyzing the types of errors detected and not detected by the system to identify areas for improvement.

CONCLUSION

FUTURE WORKS:

1. **Expanding Language Support:** Adding support for more languages and dialects.

2. Integrating with Learning Platforms: Integrating the system with popular language learning platforms.

3. Developing Personalized Feedback: Providing personalized feedback and recommendations for improvement.

5. Enhancing User Experience: Improving the user interface and experience.

6. Exploring New Technologies: Investigating the use of new technologies, such as deep learning models, to improve the system's performance.

7. Conducting User Studies: Conducting user studies to evaluate the system's effectiveness and gather feedback.

8. Developing Real-time Feedback: Providing real-time feedback to users during pronunciation practice.

REFERENCES

RESEARCH PAPERS:

1. "Automatic Pronunciation Error Detection in Non-Native English Speech" by Li et al. (2019)

2. "Deep Learning for Pronunciation Error Detection in Computer-Assisted Language Learning" by Wang et al. (2020)

3. "A Review of Automatic Pronunciation Error Detection and Correction Systems" by Chen et al. (2018)

ARTICLES:

1.Automatic Pronunciation Error Detection and Feedback Generation for CALL Applications Renlong Ai DFKI GmbH, Language Technology Lab Alt-Moabit 91c, 10559, Berlin, Germany

2.End-to-End Automatic Pronunciation Error Detection Based on Improved Hybrid CTC/Attention Architecture