National Institute of Technology, Kumamoto College

Development of an application to support pronunciation instruction

Uemura Rento, Bando Kazutoshi

Advisors: Nakashima Hidetoshi

Introduction

Currently, there are a certain number of children with various disabilities in the world. Many of them have language disorders, which are caused by multiple factors such as autism and developmental disabilities.

We have developed a pronunciation support application to promote speech in children with language disorders.

The prevalence of voice, speech, language, or swallowing disorders

Aged 3 to 6	Aged 7 to 10	Aged 11 to 17
11.0%	9.3%	4.9%

An Application Targeted at Children Aged 3 to 6 Years

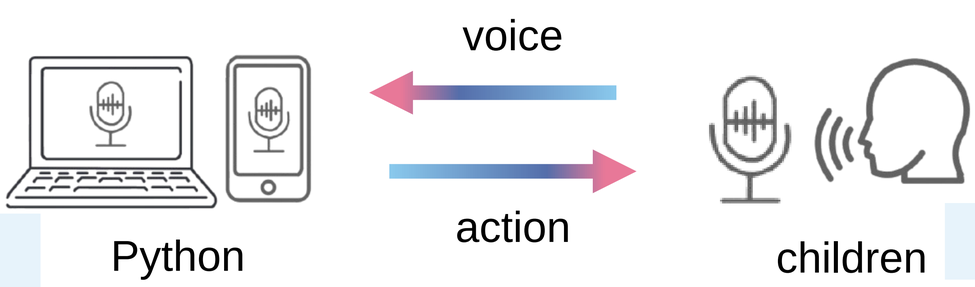
objectives

・To develop a pronunciation support application that allows children with pronunciation difficulties to practice fun and engagingly.

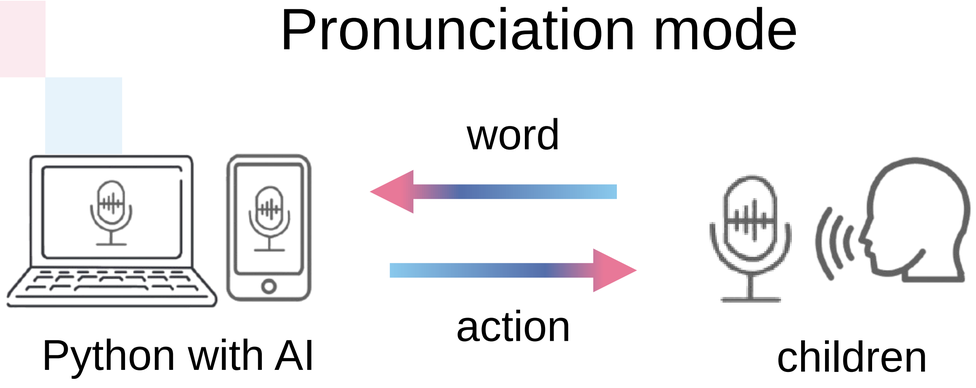
・To provide a system that enhances pronunciation awareness through visual and auditory feedback, encouraging continuous improvement in pronunciation skills.

method

Speech mode



Pronunciation mode



This application uses Python to recognize speech:

Speech Mode recognizes voices as sounds and only outputs some action on the screen when a certain sound level is input.

Pronunciation Mode uses AI to recognize speech and outputs some actions on the screen in response to certain words.

AI used for the application Introducing Whisper

Using applications

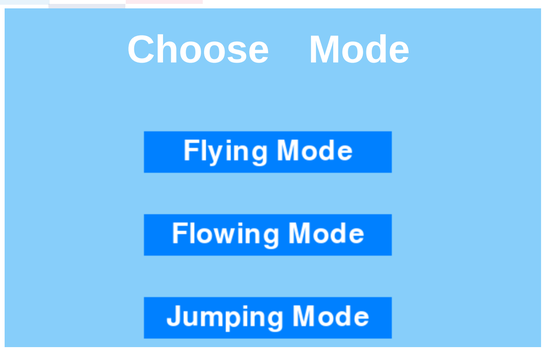
speech mode

Simply generate a voice and the object will move in response. mode is designed for children who have difficulty with speech itself.

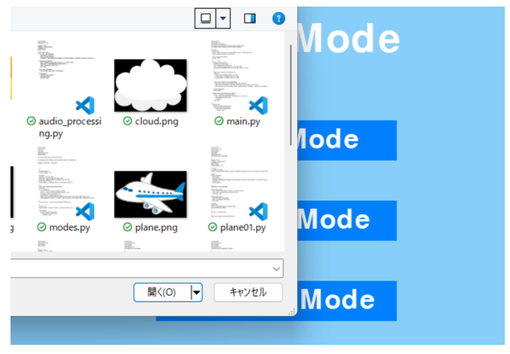
Pronunciation mode

The illustration of the letter moves in conjunction with any letter pronounced by the user.
For children who can speak but cannot pronounce.

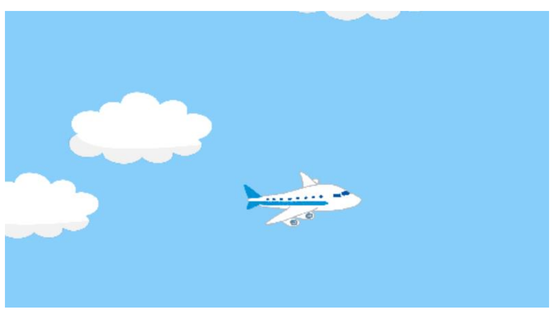
The system can be used according to the pronunciation and speech level of each user.



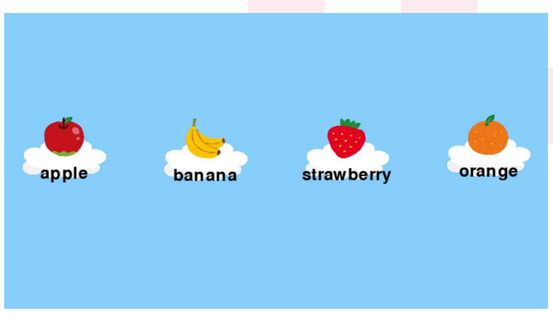
1.Home screen (Speech mode)



2.Image select



3.Execution screen (Flying Mode)



4.Execution screen (Pronunciation Mode)

point

- The application can be customized to each child's preferences.
- Users can select images for use in the image selection section.
- In Speech Mode, users can choose from three different types of image movements.
- The movements make vocalization more enjoyable.

conclusion

This study highlights that applications tailored specifically for children with language disorders can effectively support speech development and pronunciation practice. However, technical challenges and the need for individualized support must still be addressed. Based on these findings,

we propose the following recommendations:

・Improve Speech Recognition Technology ・Enhance UI/UX Design
・Consider Multilingual Support ・Expand Platform Compatibility

reference

AI used for the application : Introducing Whisper
https://openai.com/index/whisper/
National Institute on Deafness and Other Communication Disorders,"Quick Statistics About Voice, Speech, Language",2024-03-04
https://www.nidcd.nih.gov/health/statistics/quick-statistics-voice-speech-language