PROJECT: AI Extended Model

SOFTWARE REQUIREMENTS SPECIFICATION

Project-Based Learning and Technology (PBT205)

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1 Introduction

1.1 Purpose

The purpose of this project is to extend my previous project which was an app to practice writing letters for Koreans learning English. The project extends this by allowing the recognition of full words or multiple characters. This poses new challenges and development processes.

1.2 Intended Audience

The intended audience for this project is Korean native speakers that want to learn or improve their English skills. Ideally, the age range would be aimed more towards students from 12-18 but could be used for anyone depending on their English knowledge.

1.3 Project Scope

- Project Objectives: The objective is to create an AI vision based app that helps individual Korean speakers to learn and practice their English skills. Provide natural sounding and meaningful translations between English and Korean. Provide short lessons to teach a particular concept in the English language. AI vision will be used to analysis the learners written English to help them with writing skills.
- Deliverables: A functional AI application that can translate Korean to English and visa versa. Structured English lessons teaching concepts. A program that can recognize hand writing with multiple letters.
- Scope Boundaries: The only language options will be Korean-English. The expectation is for Korean's to learn English, not English speakers learning Korean. No other languages will present in this project. The project only uses text input and will not use any verbal input. The project will only teach basic English techniques and will not go into advanced areas.
- Constraints: The main constraint is time. Time is a limited factor in this project and is the main reason why the scope is bound like it is.
- Assumptions: The project assumes that learners have basic familiarity with technology and are comfortable interacting with chat-bots. It also assumes that translation programs such as Google Translate is accurate at translating provided information, this is important for verifying the chat-bot is translating correctly.

1.4 Overall Description

A chat-bot will be created that can translate messages from English to Korean and Korean to English. It will provide lessons to the user to help them learn. Short questions may also be provided to the user so that the chat-bot can understand if you are learning or not. A model will be trained to recognize hand writing, multiple characters can be recognized at once.

1.4.1 Product Perspective

This project serves as a digital replacement or aid instead instead of using physical books. The chat-bot will be available all the time and be able to give you new insight as times goes on.

1.4.2 User Classes and Characteristics

The project has only one type of user and it is the student. The student is the Korean speaker that wants to learn and improve their English skills.

2 Design Methodology

The project is designed into three modules -

- Lesson mode - A mode that aims to give lessons and then a short quiz
- Conversation mode - A mode that tries to reply to your English like a mock conversation
- Translation mode - A mode that simply provides a translation back to the user
- Hand Writing mode - A mode that gives the user a sentence or word to write and then the model will determine if it is correct

2.1 Operating Environment

The project will be developed in Windows 11. Using Python

2.2 AI Model description

A learning model will be used to acquire new understanding and knowledge base.

3 Requirements

3.1 Functional Requirements

The project is being built on Python language.
Back-End - Coding language eg., Python.
Font-End - A GUI based system using Tkinter

3.2 Nonfunctional Requirements

The system will be reliable by minimizing bugs and ensuring an uninterrupted learning environment. re-usability is important as the chat-bot will be something user will come back to so they can learn more. An easy way to input hand writing is important.

3.3 Performance Requirements

The chat-bot must respond within 2 seconds as waiting for a response would be very annoying and ruin the flow. Ultimately slowing the learning of the user. The system should not use too much memory so that more pcs can ran this and it wont slow down on lower end pcs. Model must be able to recognize the hand writing from many different ways of writing it.

3.4 Interface Requirements

The interface can be designed on Figma but then implemented in Python.

3.5 Security Requirements

Information for each user will be secured safely and only the owner of their account can view their account. Email and password will be used to keep accounts safe.

3.6 Design Constraints

Some limitations that may come into affect are hardware constraints. The system will make use of techniques to save on resource requirement which will limited the hardware constraint as much as possible.

3.7 Software Quality Attributes

While developing ongoing testing and bug hunting will be done. Testing the system is an essential part of understanding how the system is performing. The same conversations and questions will be used.

3.8 Preliminary Schedule and Budget

The project is set to take 4 weeks inline with the assessment deadline

4 References/Appendices

NLP - Natural Language Processing