TED UNIVERSITY

Faculty of Engineering

Department of Computer Engineering

CMPE 491 - Senior Project Specification Report

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Revision History

Name	Date	Reason for Change	Version
General	18.03.2024	Each group member added their parts.	1.0
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Table of Contents

Project Specification Report

1. Introduction

Communication is one of the most fundamental points of human interaction that facilitates the exchange of emotions and information between people. In addition, the diversity of languages spoken around the world poses a major obstacle to communication between people with different native languages. Although learning a language is a valuable thing, it is impossible for a person to learn all languages. Considering that communication has the most important place in our lives, we will make an application that will allow us to translate in a synchronized manner, which will allow us to overcome the obstacles to this.

The simultaneous translation system will revolutionize communication by enabling real-time translation of spoken language by using speech recognition and natural language processing technologies. With the simultaneous interpreter system, individuals will no longer be limited by linguistic barriers and new opportunities for intercultural communication, cooperation and understanding will emerge. Whether you are doing international business, or connecting with people from different backgrounds, the translator system will serve as a tool that makes life easier. In this project specification report, we outline the key requirements and specifications for the development of the simultaneous interpreter system.

1.1 Description

The main goal of this project is to remove language barriers in real-time communication. The mobile app will support synchronous translation for both voice and text calls. Users can add friends, text, or make voice calls, with translations occurring in real-time. Key technologies that will be in use are speech recognition, machine translation, and text-to-speech systems. The application will feature a user-friendly interface to ensure smooth navigation and an enjoyable user experience. Target users will be international travelers, business professionals, and anyone engaged in cross-cultural interactions. Benefits of real-time translation include enhanced communication, convenience, mobility, inclusivity, and cost savings by eliminating the need for human translators.

1.2 Constraints

Economic: Materials shall be cost-effective without compromising audio quality.

Social: Cultural sensitivity in translation accuracy and language support shall be provided. Users' personal data and conversations should be protected.

Political: There must be compliance with international regulations and standards regarding wireless communication devices.

Ethical: Biased and discriminatory translations should be avoided. Data handling should be transparent. Users should give consent for speech processing and translation.

Safety: Tests for ensuring safety standards should be conducted.

1.3 Professional and Ethical Issues

Accuracy and Reliability: Ensuring the accuracy and reliability of translations is crucial. Users will rely on this technology to convey their messages accurately, so any errors or inaccuracies could lead to misunderstandings or miscommunications.

Privacy and Data Security: The system will involve the processing of sensitive personal data, such as speech input. It's crucial to implement robust privacy and data security measures to protect users' privacy and prevent unauthorized access to their data.

Cultural Sensitivity: Translating language involves more than just converting words from one language to another; it also requires an understanding of cultural nuances and context. The system must be sensitive to cultural differences and avoid any translations that could be perceived as offensive or inappropriate in different cultural contexts.

2. Requirements

Speech Recognition: Speech recognition will be used to accurately capture the speech.

Real Time Translation: App will be translating spoken language into the desired language in real-time without any significant delay.

High Accuracy: Translation should be accurate to prevent any misunderstanding in translation.

Language Support: App will support the majority of the most commonly used languages.

Adaptability: App will translate accurately in different environments and background noises.

Multimodal Input: App will receive input as speech and text.

User Friendly Interface: App will be easy to use and understand. It will make the user experience as pleasant as possible. Simple interface will minimize the user's effort.

3. References

- Article " ACM Code of Ethics and Professional Conduct" - Association for Computer Machinery Website

  Link: **https://www.acm.org/code-of-ethics**

- Article "Computer and Information Ethics" - Stanford Encyclopedia of Philosophy Archive

  Link: **https://plato.stanford.edu/archives/sum2020/entries/ethics-computer/**