

## Abstract

According to the Centers for Disease Control (CDC), roughly 12 million people in the United States above the age of 40 are visually impaired. In adults 18 years and older, visual impairment is one of the top 10 disabilities. It can have an enormous effect on one's independence and quality of life. Assistive technology through artificial intelligence (AI) can support the visually impaired in everyday life functions.

Our application is specifically designed for reading text such as small print. After the user selects the language for translation out of 35 choices and takes a picture of the text with the app, the text is extracted from the image. The text is converted to speech and played to the user in audio format. The text is also enlarged and displayed on the screen. Overall, this app is a benefit to society through increasing the quality of life for the visually impaired.

## Introduction

S'eyed'Kick is a mobile app that assists individuals to live a more independent lifestyle. The goal is to improve the quality of life through using a mobile app that takes text from an image and converts it to audio.

### Core technology used in this app:

State-of-the-Art AI Techniques

- Real-time text identification
- Real-time multi language translation
- Real-time text to voice

## Research Questions

- How will the application help visually impaired to see label better?
- How will the application make it easier for someone visiting another country?
- How will the application help anyone who is having difficulty reading small print?
- How will the application help someone new to a country and not a native speaker?
- How will the application help someone who is having difficulty reading small print in a noisy environment?

## Materials and Methods

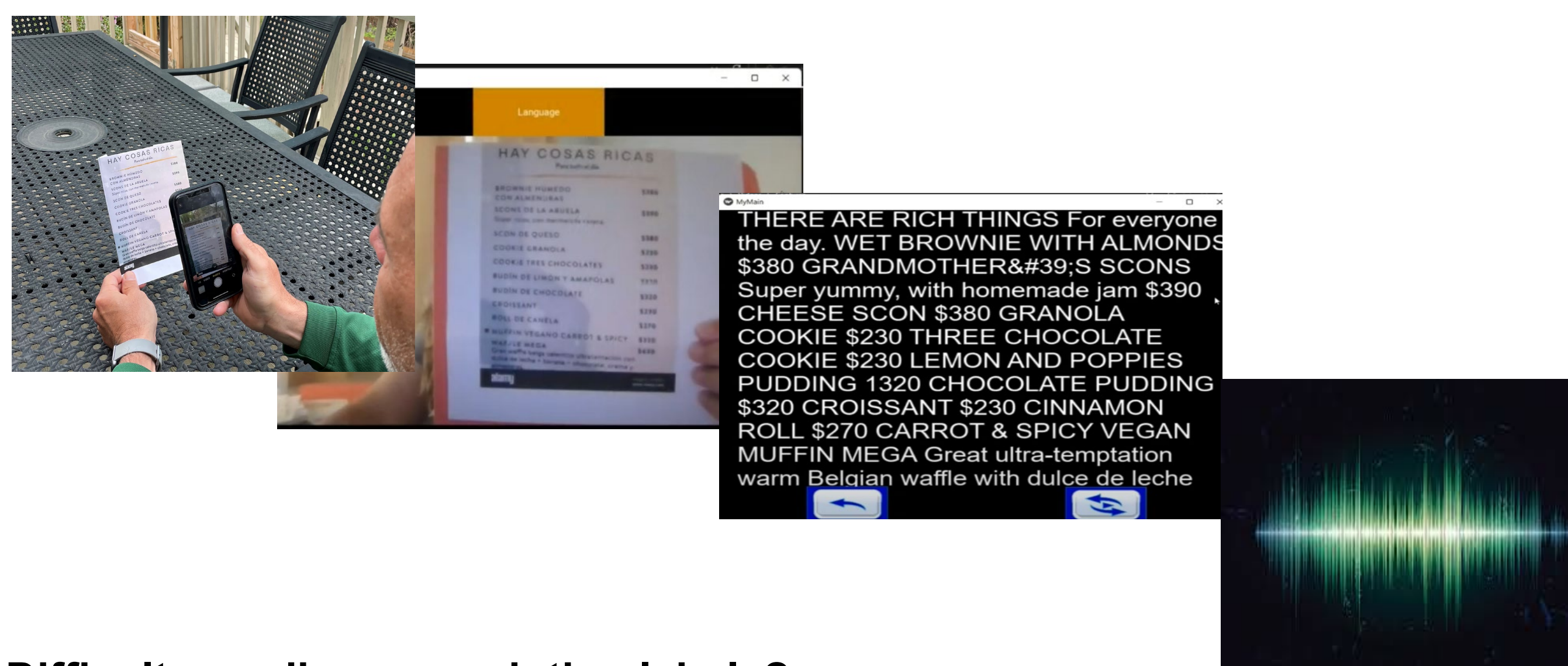
The application was developed in Python using the Kivy framework. We utilized Google Cloud for computer vision and natural language processing. Draw.io was used to create images for screens.

The development steps were allocated into the following categories:

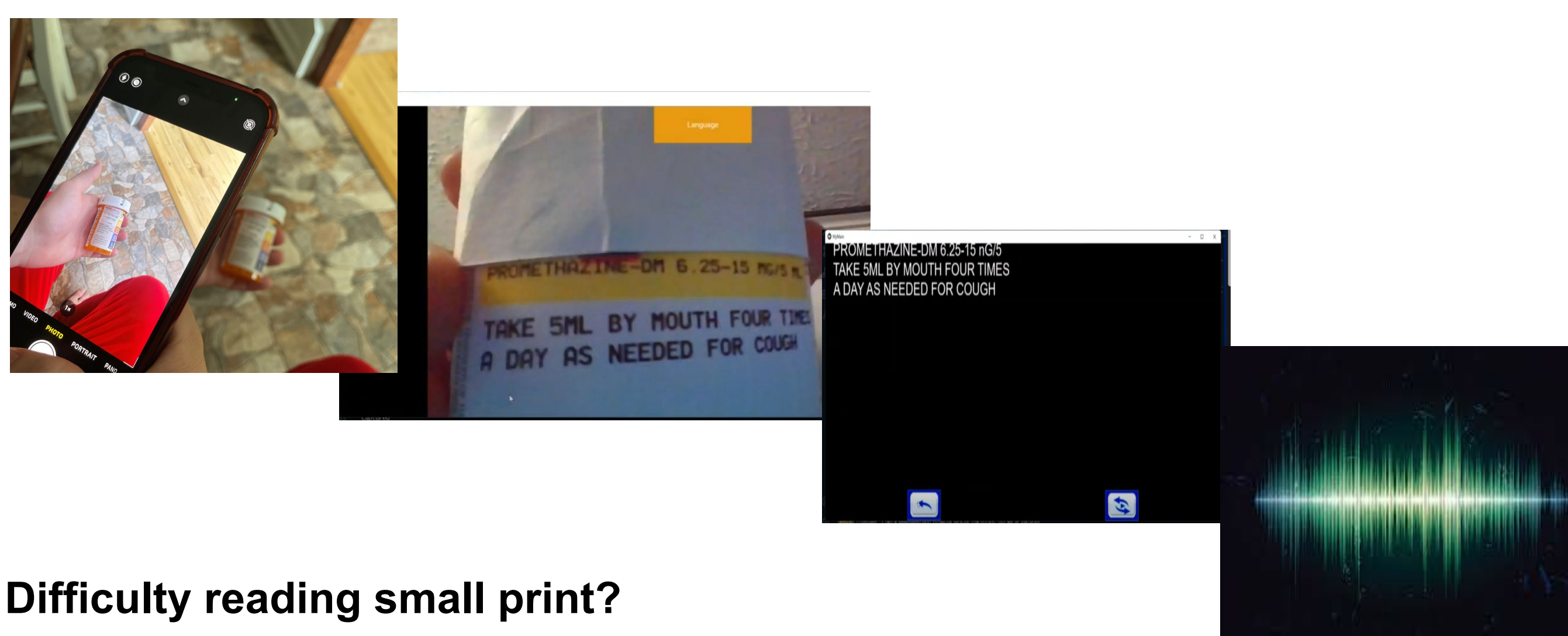
- General mobile framework development (i.e., screen navigation, usability, and user experience features) using Kivy
- Camera functionality using Python and Kivy
- Explored state-of-the-art AI technology
- Integrated advanced and efficient AI package/API into mobile app
- Real-time text identification
- Real-time multi language translation
- Real-time text to voice

## Overview

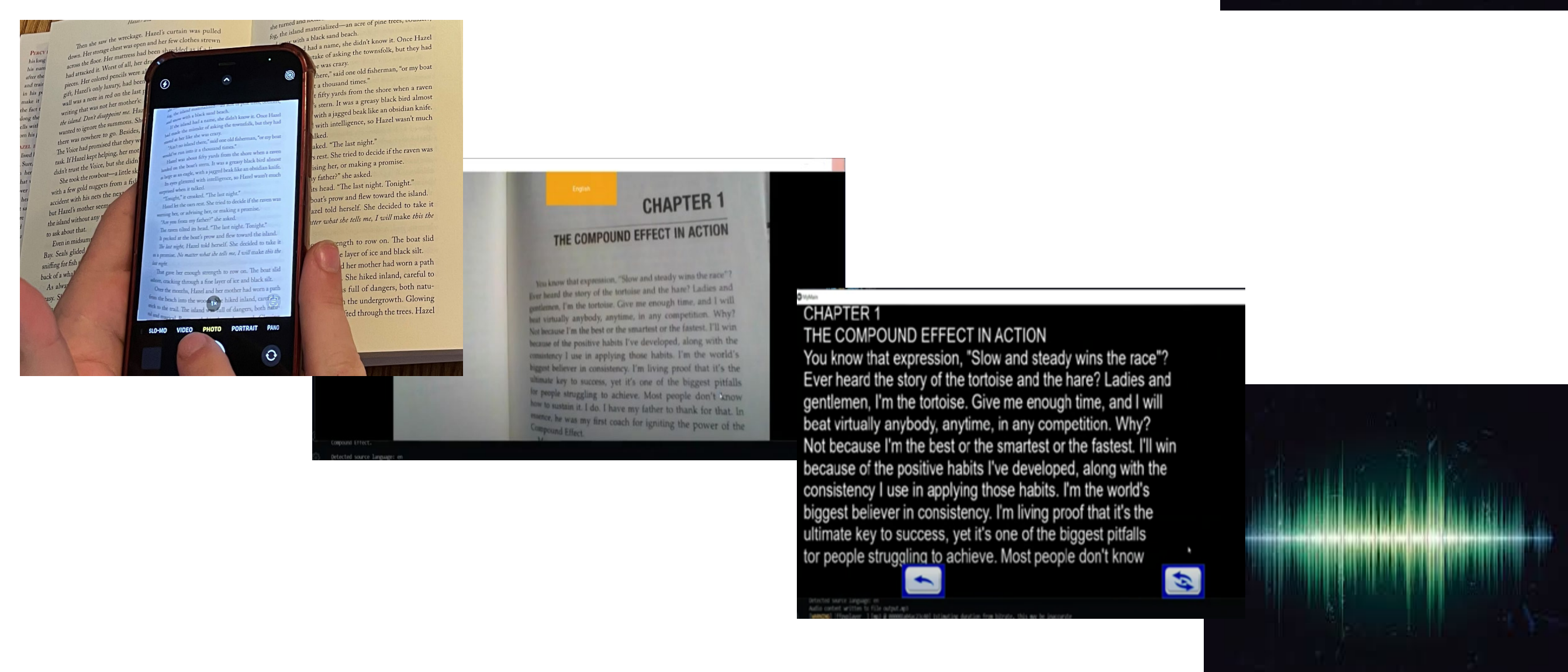
### Need to view a menu in a different language?



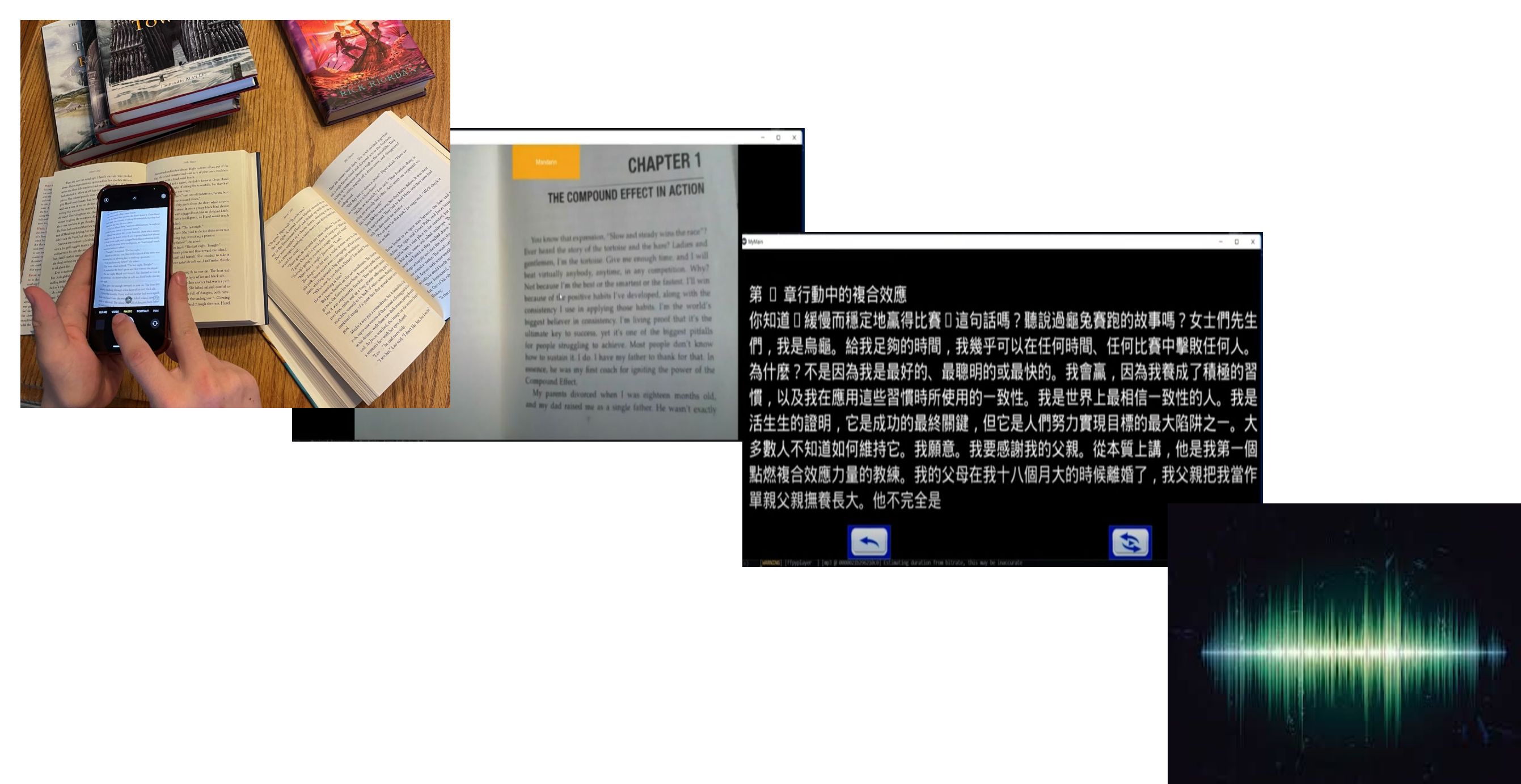
### Difficulty reading prescription labels?



### Difficulty reading small print?



### Want to read/listen to a book in a different language?



## Conclusions

This project does make an original creative contribution to the discipline. It seeks to use technology to assist those who are visually impaired in reading small print. This is a creative contribution because it uses computer vision and natural language processing to serve a specific population and cater to their needs.

It has a large potential to be impactful within the field through its dissemination into the academic community. Through academic research, the effectiveness of this application can be studied and determined. If proven to make a positive impact in the intended community, this application can then be improved upon for use in the public.

The intellectual merit of this application spans wider than the current focus group for this project. Through the production of this application, there are many different studies that could be conducted to assist in advancing the knowledge and understanding of communities with low vision, reading comprehension, or health literacy. This could include understanding better how to assist persons that are not native English speakers or those who have a higher need for verbal communication over written communication.

Some specific use cases for this application are reading and/or translating medication bottles, street signs, menus, ingredients on food labels, book or magazine passages, utility bills, and instruction manuals. Not only will the application read and translate the text, but it will make the text larger which would be beneficial if the user is in a public place with outside noise such as a grocery store.

Deploying the app to Google play and/or Apple would be the next steps for this project.

## Acknowledgments

Dr. Ying Xie

## Contact Information

sallen16@students.kennesaw.edu  
 jbarne54@students.kennesaw.edu  
 lpope19@students.kennesaw.edu  
 chill165@students.kennesaw.edu  
 aadejuwo@students.kennesaw.edu



Scan to access our website

## References

- <https://www.cdc.gov/grand-rounds/pp/2017/20170919-senior-aging.html>
- <https://www.cdc.gov/visionhealth/basics/ced/fastfacts.htm>
- <https://www.ibm.com/topics/computer-vision>
- <https://monkeylearn.com/blog/nlp-ai/>
- <https://cloud.google.com/vision/docs/ocr>
- <https://deeplearning.com/blog/article/wavenet-generative-model-raw-audio>
- <https://cran.r-project.org/web/packages/googleLanguageR/vignettes/text-to-speech.html>