

SIGN LANGUAGE RECOGNITION WITH MACHINE LEARNING



Bersu OĞUZ– Öznur ÜSTÜNDAĞ
Batuhan BAYRAKTAR– Numan SÜME

Dr. Öğr. Üyesi Sibel TARIYAN ÖZYER



Çankaya University, Department of Computer Engineering

Abstract

Technologies that help people with disabilities have not improved as much as other technologies. This project aims to bring deaf people closer to other people. According to the project, Deaf people use that application to translate what they want to say to Turkish. In addition to that, people who need to communicate with deaf people also want that translation. We also examine machine learning and artificial intelligence science literature to evaluate how to work in this field.

Keywords: Sign language, deaf people, deep learning, machine learning

Introduction

According to research which was done in 2017, There is currently more than 3 million people who have been suffering from deafness. Previous works work in English. Also, one of the projects uses gloves to recognize. These are not useful and efficient in real life. Besides, people can not carry gloves all the time. People need a real-time translator to sign language to human languages. In addition to that, there is not any study in Turkey. Solution statements: In this project, there is no need to use gloves like other similar applications plus this software works for Turkish sign language.

Solution

This project is a web-based project. We explored methods for image processing and deep learning. The requirements we set beforehand during the construction of the project have changed. We took the sign language pictures that we will use in the deep learning side of our project. We researched sign language animations for text-to-image translation. Since the number of data we set before exceeds the power of our computer, we reduced the number of data. Thus, we obtained more accurate results. While we were going to use the Django web framework for web design, we used React web framework, which is more suitable for our project and because the Tensorflow connection is easier. We have kept our interfaces simple to offer a more understandable interface to the users, but the background structures of this project are quite complex.

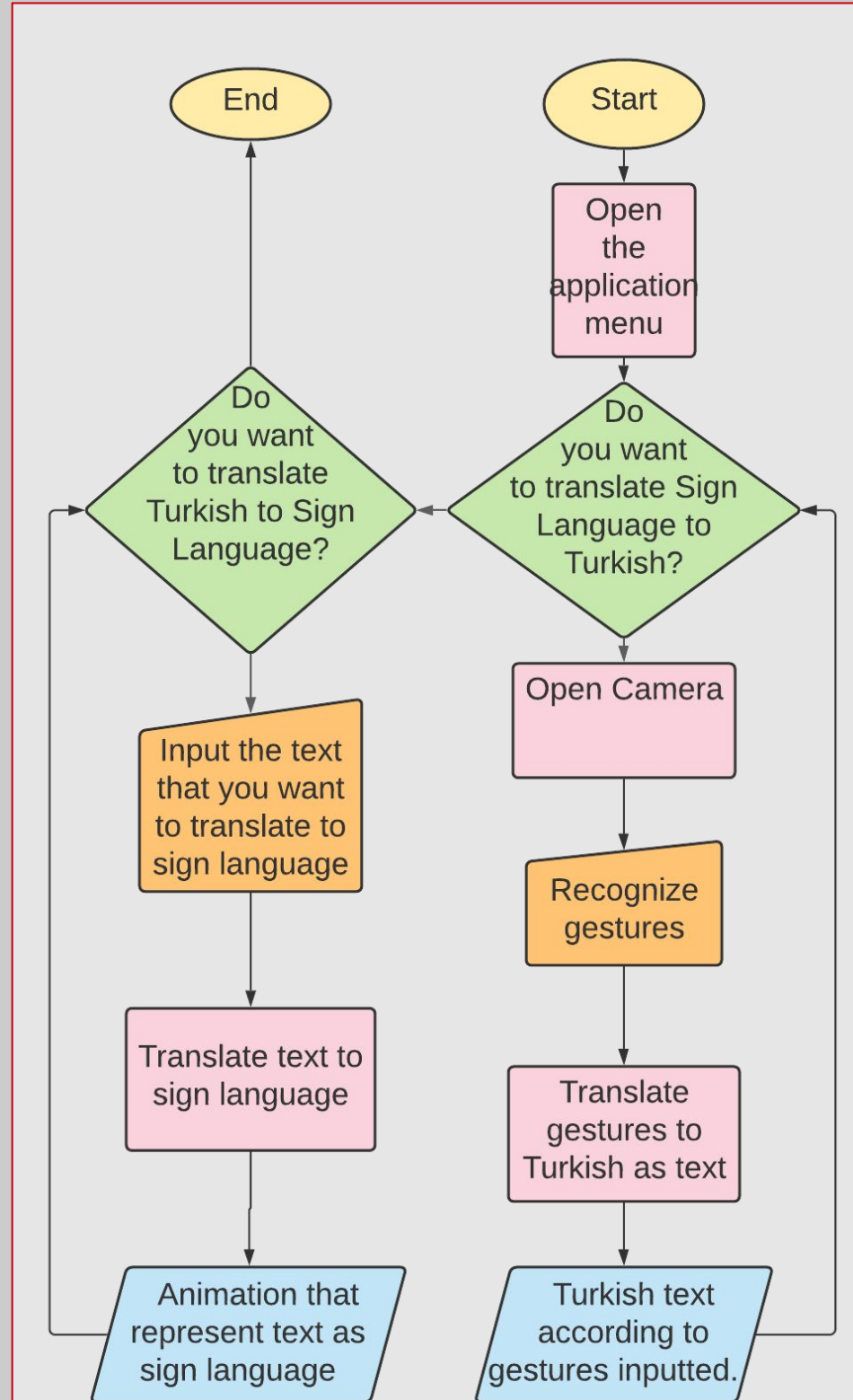


Figure 1 - Flowchart

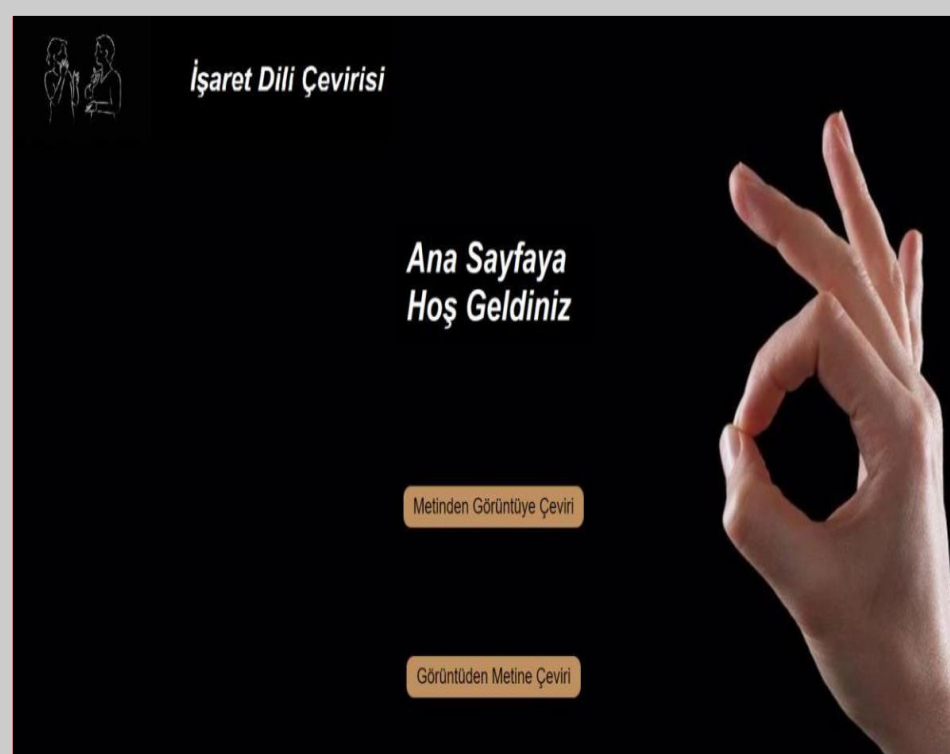


Figure 2 – Homepage



Figure 3 – Text to Image Translator Page

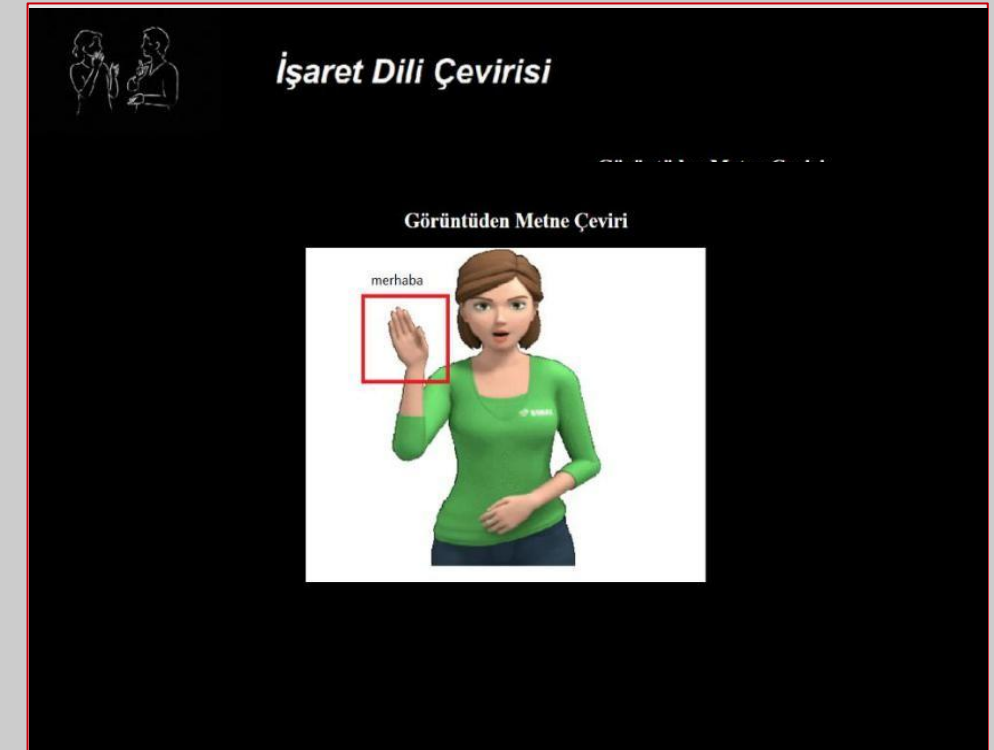


Figure 4 – Image to Text Translator Page

Results & Conclusion

All in all, this project has been a useful project for deaf people and those trying to communicate with them. The application was developed for Turkish sign language users. With this application, Turkish users can translate sign language to text or text to sign language. It provides better learning for Turkish sign language also. In this project, we learned how to develop machine learning algorithms. We had to keep our dataset limited due to the resources we have, but we can expand our dataset in the future after we improve the conditions we have. Thus, deaf people have access to more words.

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