

Viittoma kääntäjä

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Information Technology, Option of Device and Product design

Introduction

The aims of this project were to make a translator application that any user can easily interact with and use. For us the aim was to learn the skills and methods applied in the project, mainly about machine learning algorithms, telecommunications and frontend coding and developing.

Objectives

The objective was to do a Finnish sign language alphabet translator application. Main functionality is that a user takes a picture/video of a somebody doing a sign and then they get a prediction as to what the sign was. User can also sign into the app and get their last 5 pictures from the database. User can also continue to use the application without signing in, but then they can't see their previous pictures or any other data relating to them.

The frontend is on Android and is coded in Kotlin.

The backend and the database are in Google Firebase, which is responsible for authentication of the users and stores the pictures and videos to Cloud Storage and any other necessary user data to the Firestore database.

Telecommunications Project

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Methods

The application was made in Android Studio and can be loaded to any mobile phone that meets the app requirements, in this instance the student's phones were used. The communication happened through Googles Firebase RestApi, that uses HTTPS/2 protocol and it was easy to connect to the application.

The machine learning prediction is done on a Linux server. The application sends a picture to it, which is received by PHP script. After getting the picture it runs the Python script that does the actual prediction and the result is printed to a another PHP script to be viewed on a website.

Prediction is: K



FIGURE 1. How the prediction is displayed in the web

Results

Most of the functionalities are working as they should. The app correctly continues through the activities when asking for permission and the pictures are stored in the Cloud Storage and their URLs in Firestore database. We did not have the time, to do the activity to show the users previous pictures.

For example, the translator activity works as expected. The picture is taken on the application (See figure 2 below). The picture is put through the prediction and the result printed on the web, even if rarely right, but with the training data we had, it's not unexpected.

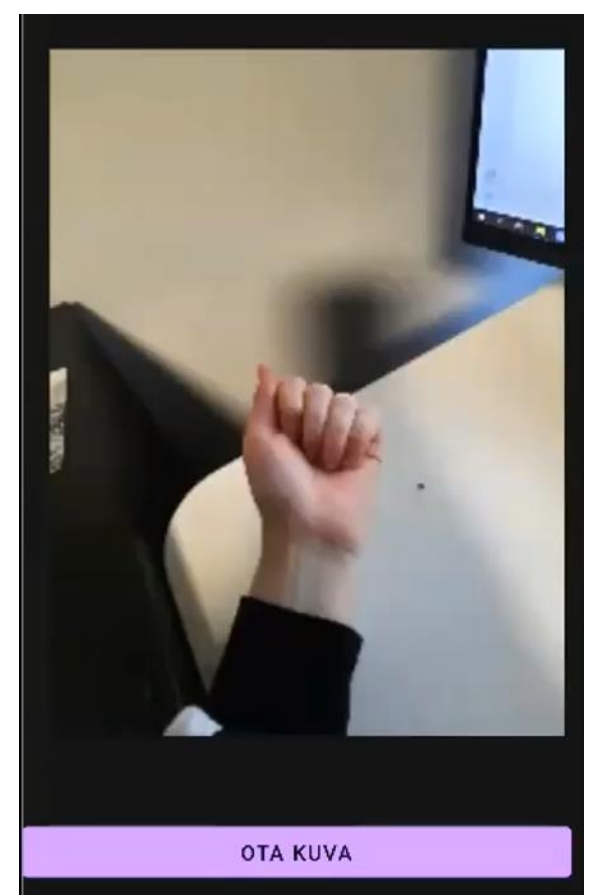


FIGURE 2. The translator activity

Conclusions

This project has been quite challenging having to learn a new programming language and to use a new development environment. In this moment the functionalities work as expected and the project is on time. From this project we have learned Kotlin, a bit of Java, and learned to use the Android Studio environment. It has also made our understanding of the Tensorflow library better.