BABIES CAN TALK

AI TRANSLATES BABY SIGNING INTO SPEECH

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About us

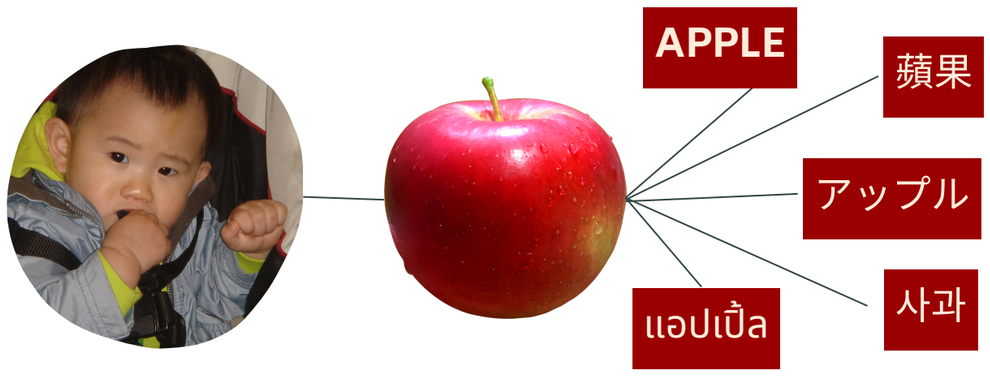
INTRODUCTION

Language is communication among human beings and can be conveyed through speech, writing, or sign. Baby sign language, also known as baby signing, is a communication approach babies can use to express needs before they can talk. However, people who have not learned baby signing cannot understand the expressions of babies. With the rise of artificial intelligence(AI), speech-to-text and text-to-speech conversion APIs (application programming interfaces) are emerging daily. In this project, we trained an AI model to convert baby signing to speech. As a result, babies can SPEAK out about their needs, which opens up a new means of communication!

Scratch demo

OBJECTIVE

We aim to develop an AI model which can recognize baby signs and then pronounce the meaning of signs in various spoken languages.



MATERIALS

Baby signs used in this project are based on American Sign Language (ASL) lexicons.

30 different baby signs used in the project

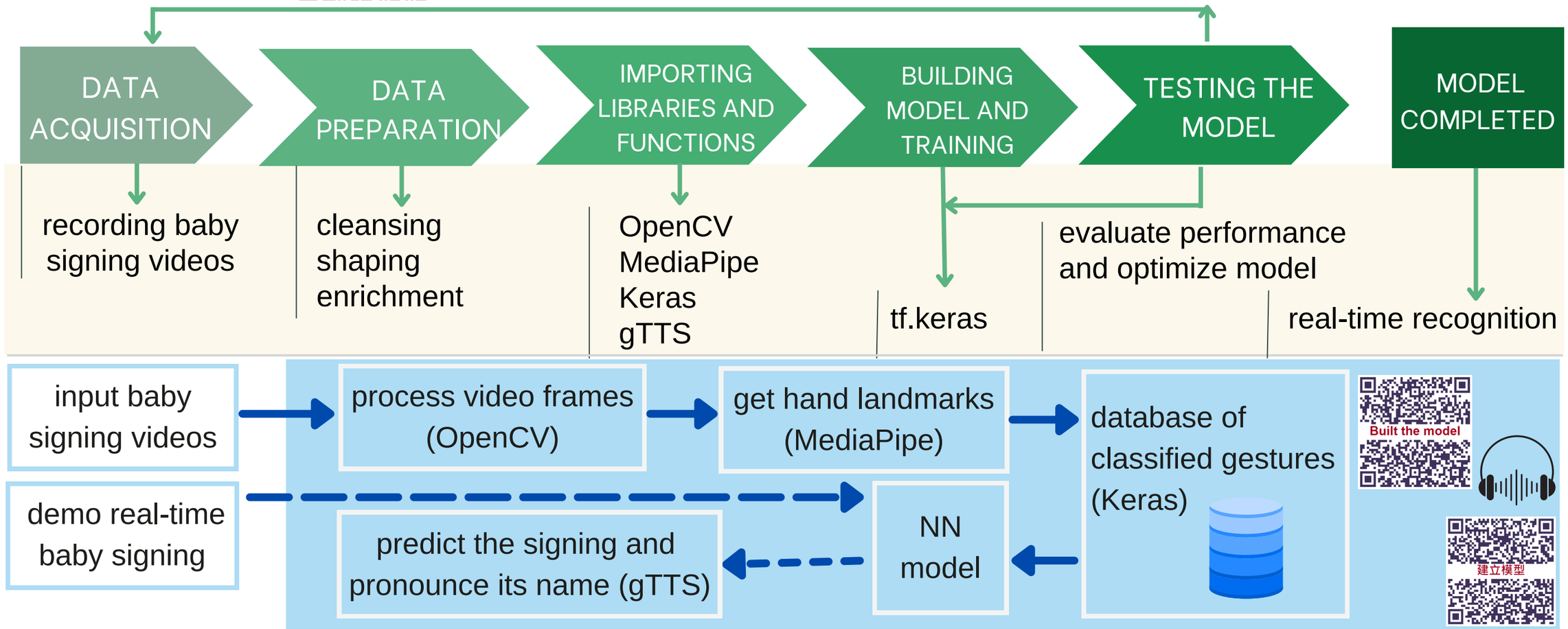
drink	Slide	tired	poop	hurt	
dream	music	above	play	hungry	
cute	try	sorry	orange	horse	
book	ball	sleep	more	good	
cat	water	share	milk	elephant	
again	bath	apple	animal	all done	

About input data

訓練模型資料集

METHODOLOGY

Methodology



Built the model

建立模型

RESULTS

1. The three hundred baby-signing videos were correctly categorized in 30 labeled gestures.
2. The trained model got great accuracy at test and validation (99.8% and 97%)
3. Real-time baby singing could be recognized correctly with good accuracy.
4. The recognized baby signs could be pronounced in various spoken languages, such as English, Chinese, Korean, French, Spanish, and Japanese.

Demo Show

CONCLUSION AND FUTURE ENHANCEMENT

We hope the AI translator will help babies develop their speech and language skills, as well as build their confidence and self-esteem. Simultaneously, parents can hear and understand the needs of babies, increasing a closer parental bond.

For future research, increasing the number of gestures/baby signs as input data in training the model is expected to allow the translator to become more powerful!

RELATED LITERATURE

[1] Joanna Scot, " The Effects of Baby Sign on Child Development," OPEN ACCESS THESES & DISSERTATIONS, 2015.
[2]MediaPipe on GitHub, available: https://google.github.io/mediapipe/
[3] Using the Text-to-Speech API with Python, available: https://codelabs.developers.google.com/codelabs/cloud-text-speech-python3#0
[4]Baby Sing Language, available: https://babysignlanguage.com/dictionary/