“Hanry”

Sign Language Translator

Alvis Kwok, Jeffrey Cheng, Jack Lau

Background

Objective

- Limited support for deaf-mute in current society
  - 150,000 deaf-mute, only one school for education
- Break the barrier of sign language

Project values

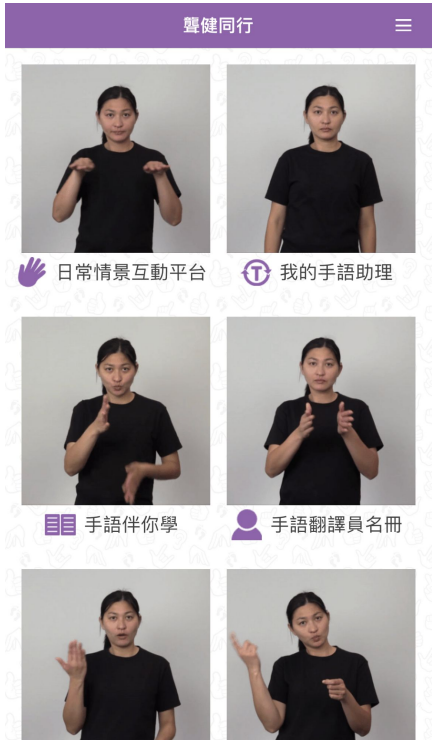
- Unique product on the market
- Build a “Barrier Free” society
  - Only around 4000 people know sign language in HK
- Create job opportunity for deaf-mute

Data collection and processing

- Background
- Data collection and processing
- Demonstration
- Limitation
- Conclusions

Collection and Processing

- Adapted Mediapipe and Opencv
- Learnt the sign language through an App called Ear Connect
- Recorded 17 actions
  - including different daily situations
- 30 frames per second, 30 sequences for training
- Learn rate 0.00001, epochs 300




```
model.compile(keras.optimizers.Adam(lr=0.00001), loss='categorical_crossentropy',
```

```
model.fit(X_train, y_train, epochs=300, callbacks=[tb_callback])
```

Challenges

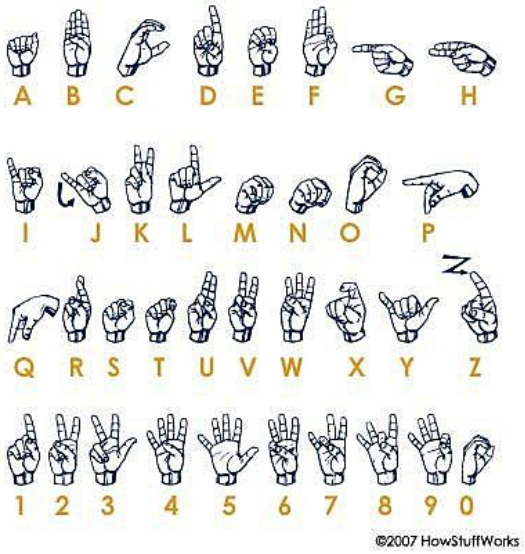
- Recording difficulty
- Time consuming
- Accuracy, only 21 points for each hand

Demonstration

Let’s check out the Demo!

Limitation

- Different countries have different sign language
  - ASL vs Chinese Sign Language
- Detection issues
  - Background
  - Lighting
  - Distance
  - Speed
- Non-stable appearance output
  - Fixed time detection
  - Word to word



Conclusions

Result

- Recognized most of the actions(16/17)
- Accuracy 97%/93%

```
Epoch 300/300
382/382 [==============================] - 5s 12ms/sample - loss: 0.0687 - categorical_accuracy: 0.9738
```

```
accuracy_score(ytrue, yhat)
```

```
0.9375
```

Future

- Adaptation for mobile or App which could be installed in public place
- Improve detection time
- From word by word to sentence or conversation
- Add in audio translation
- Create the “Barrier Free” society for deaf-mute

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Thank you