

SIGN ME UP

An *Android Sign Language Translator*
Using A Convolutional Neural Network



Carlos Miguel E. Canonizado and Jaime M. Samaniego

SIGN ME UP



Objectives of the Study

- Translate *user-captured sign language* to text using a retrained **convolutional neural network** called Inception-v3 model;

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- Translate *user-inputted text* to sign language using a **series of image definitions**; and

Objectives of the Study

- Translate *user-captured sign language* to text using a retrained **convolutional neural network** called Inception-v3 model;
- Translate *user-inputted text* to sign language using a **series of image definitions**; and
- Translate sign language **regardless** of the hand's orientation or size.

Limitations of the Study



Limitations of the Study



Scope of the Study

Vocabulary available **(50)**:

For text to sign language

11:42 AM



← Vocabulary

SIGN ME UP

has 50 available gestures so far

Single Characters (36)

Alphabet (A-Z)
Number(0-9)

Words / Phrases (14)

Really / Question
Okay / Good job
Equal / Equality
Gotcha / Later
Halt / Stop
Thank you
I hate you
I love you
Hi / Hello
That
LOL
You
Yes
No

Scope of the Study

Vocabulary available (**31**):

For sign language to text

Constraints:

Data gathering and time

11:42 AM

← Vocabulary

SIGN ME UP

has 50 available gestures so far

Single Characters (36)

Alphabet (A-Z)

Words / Phrases (14)

Okay / Good job

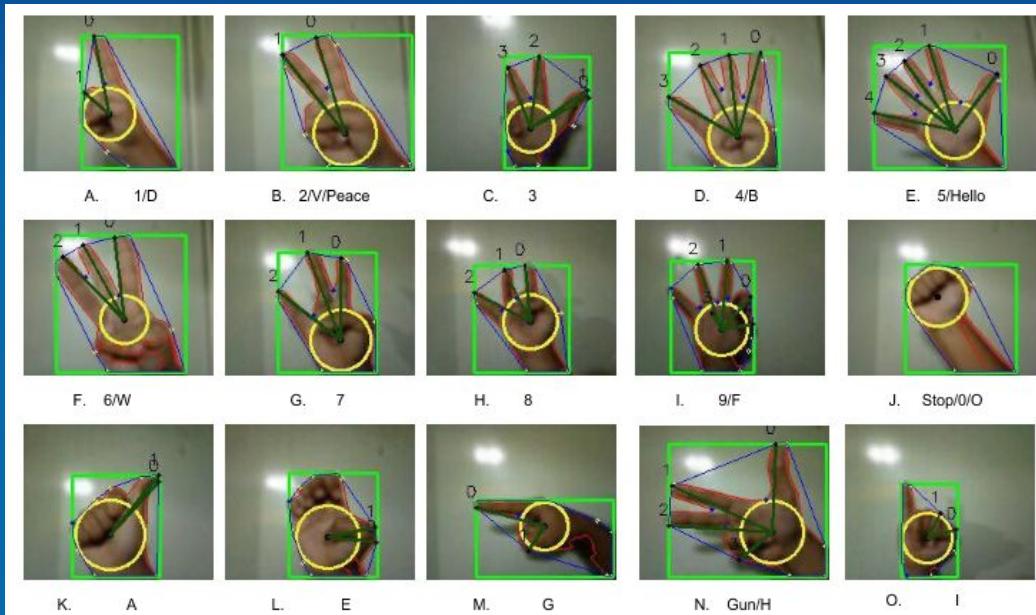
Hi / Hello
That

Yes
No

PREVIOUS WORK

Villamor and Samaniego (2018)

A Gesture-to-Speech Assistive Application

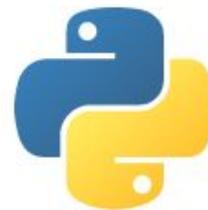


IMPLEMENTATION

Technologies



Android
Studio



python™

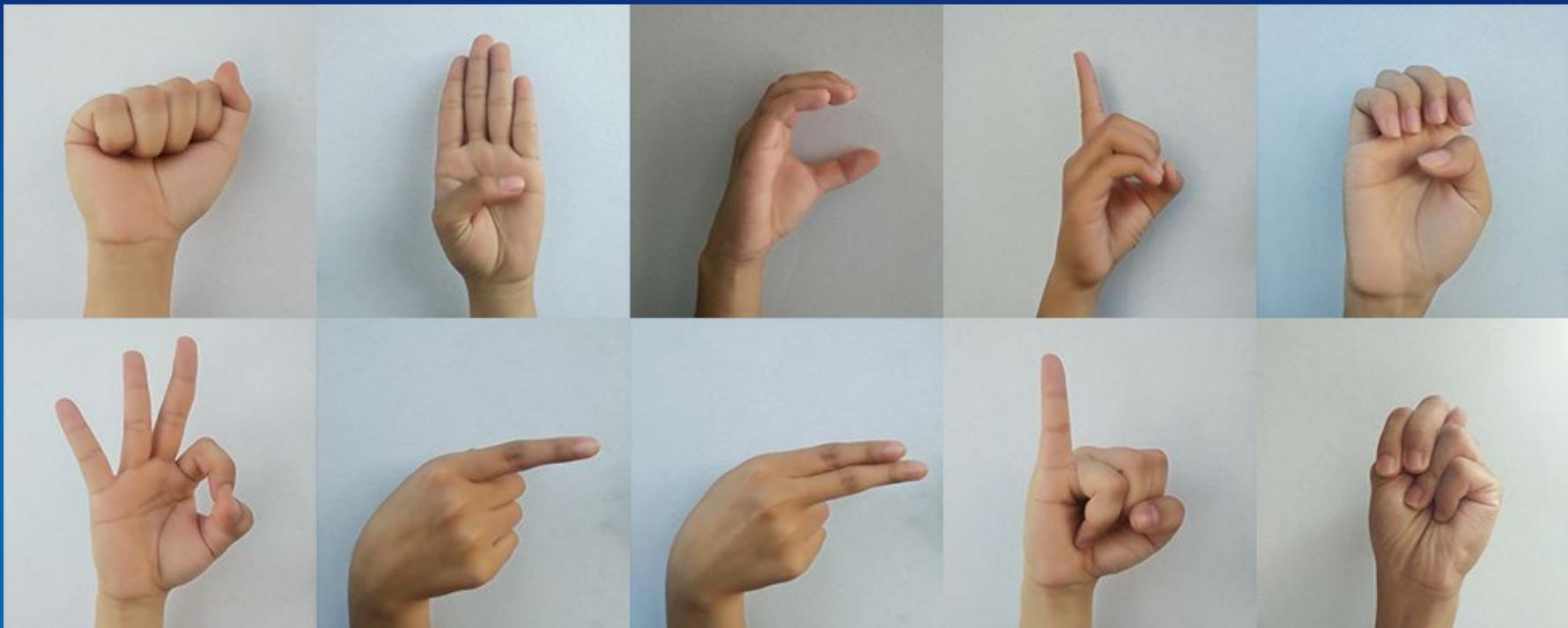


TensorFlow

Data Gathering



Data Gathering



Text to Sign Language

Hello|Hi



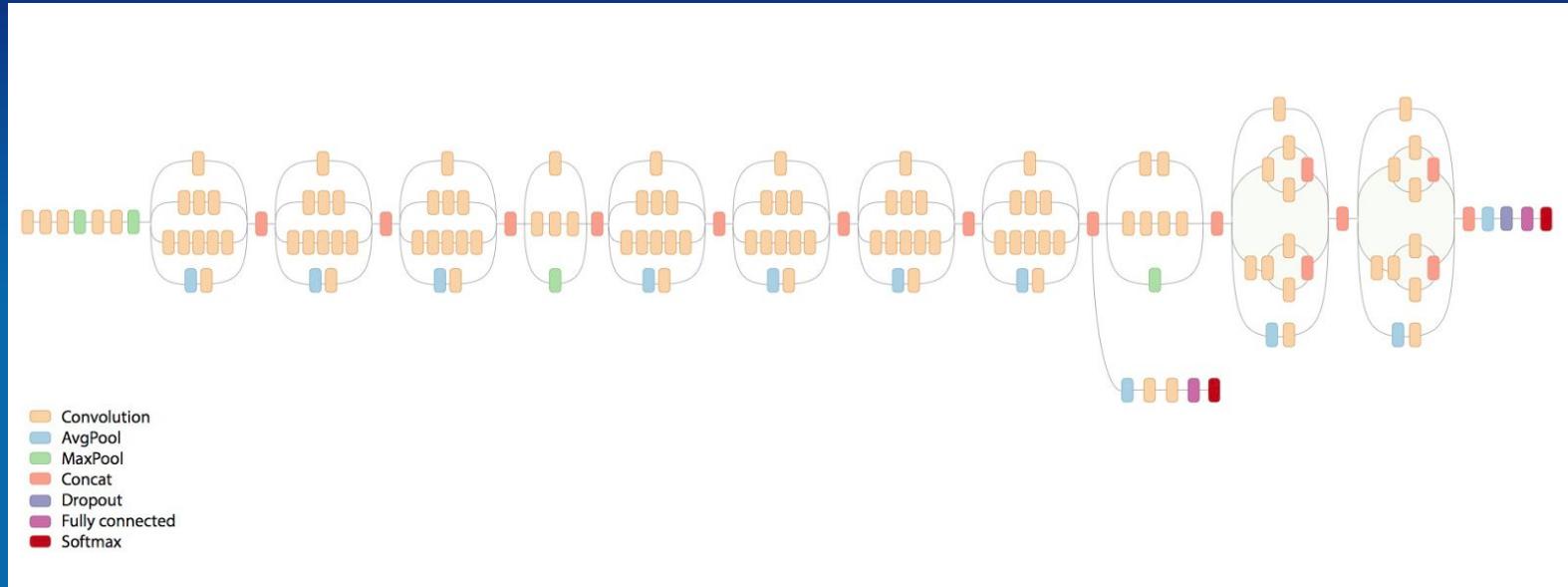
Yes



Okay|Good Job



Sign Language to Text



Inception-v3 model architecture

RESULTS

Text To Sign

11:42 AM 11:42 AM

Text to Sign Language Text to Sign Language

Special characters are not allowed!

@#\$#&#

| Input message here

Translate

Hi / Hello



Hello

| Input message here

Translate

Sign To Text



11:42 AM

← Sign Language to Text



The definition appended
is the one with the
highest percentage.

Translate

Metrics Used

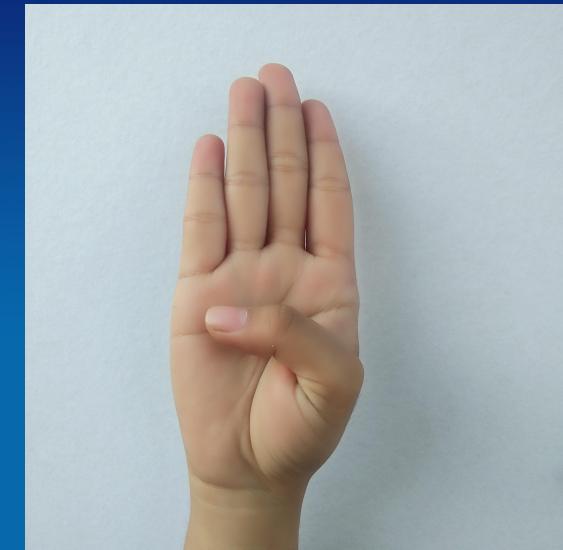
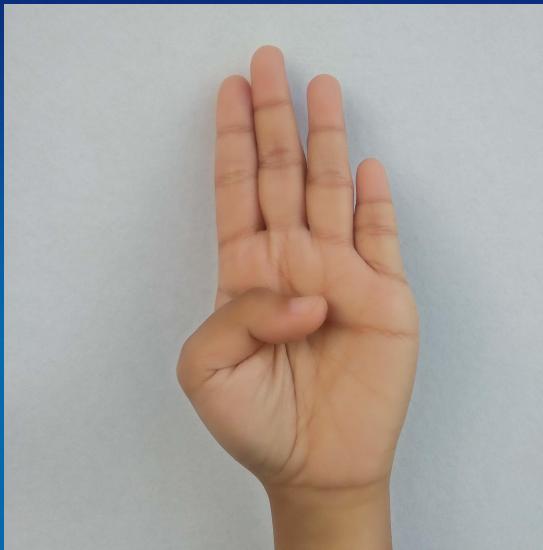
- Confidence Level
- Top-1 Accuracy
- Top-5 Accuracy

Highest Confidence Level



“Okay/good job” with 97.82%

Lowest Confidence Level



“b” with 27.11%

Predictions of “b”



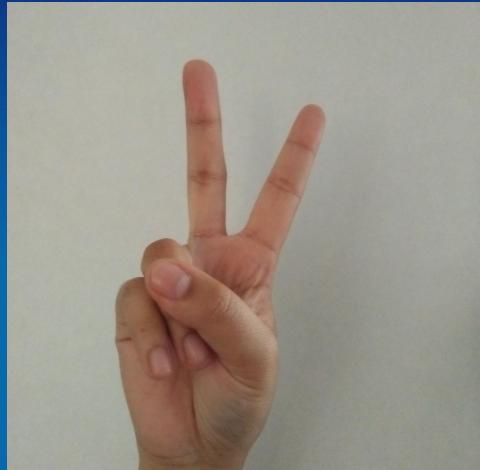
b - 1



f - 2



k - 1



v - 1

“b” Results

- Confidence Level = **27.11%**
- Top-1 Accuracy = **20%**
- Top-5 Accuracy = **100%**

Averages

- Average Confidence Level = **60.03%**
- Average Top-1 Accuracy = **81.94%**
- Average Top-5 Accuracy = **97.42%**

CONCLUSION

11:42 AM



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Your friendly Sign Language Translator

Sign Language to Text

Text to Sign Language

Vocabulary

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