

ASL Extraction via Deep Learning

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Introduction

What is ASL?

American Sign Language (ASL) is a complete, complex language that employs signs made by moving the hands combined with facial expressions and postures of the body. It is the primary language of many North Americans who are deaf and is one of several communication options used by people who are deaf or hard-of-hearing [1].

In this project, I would like to develop an algorithm to detect human hand and interpretation. In this way, we can understand gestures in images by using image processing and deep learning algorithm to classify the gestures. Although this algorithm has varied applications like human machine interface, I will use this algorithm to detect and interpret American Sign Language.

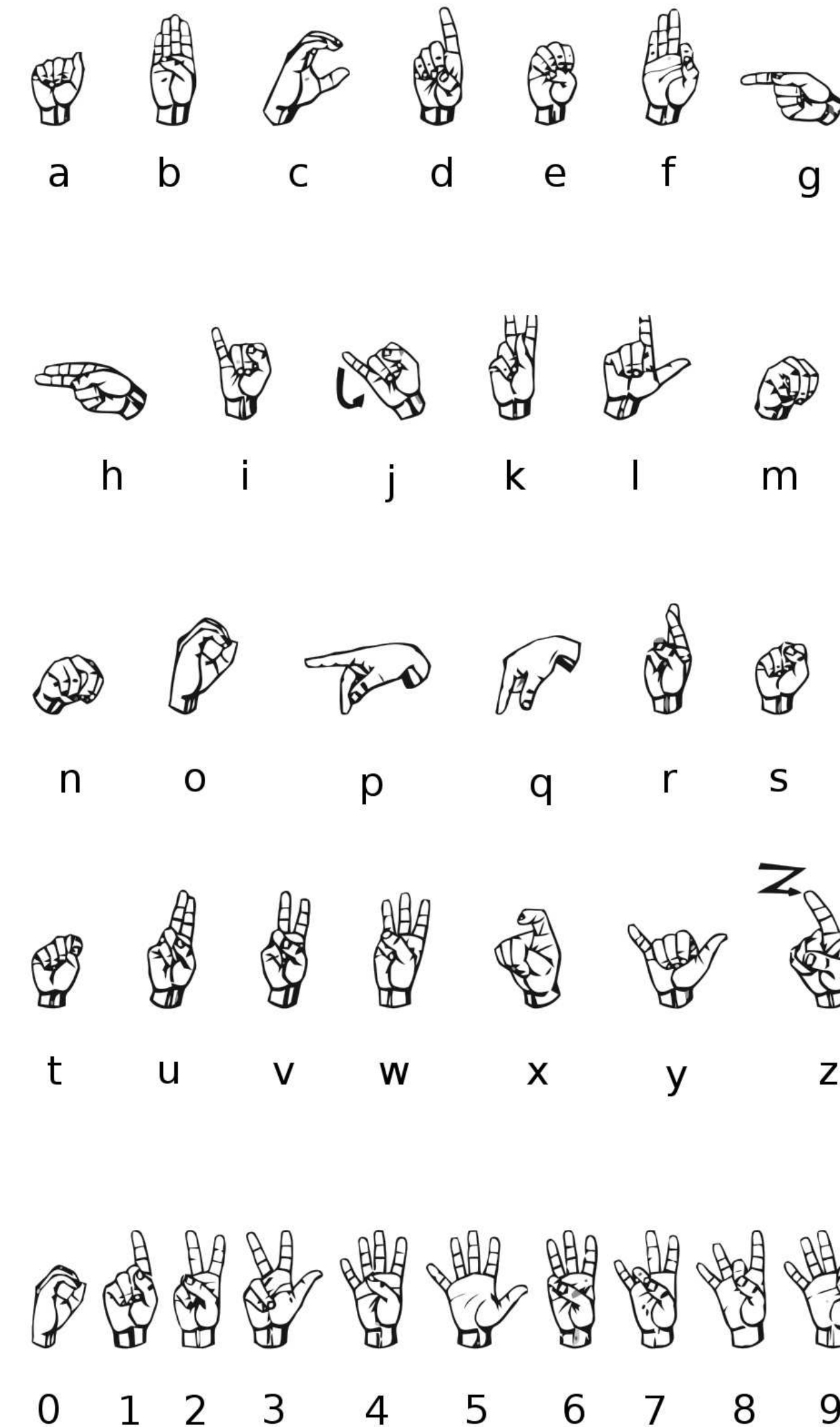


Figure 1: ASL Fingerspelling alphabet as used in this project. Note that 'j' and 'z' are excluded from our considerations here, since they are not static symbols.

Approach

Method

In order to do this project, I divide into two parts the whole problem. First, we take an image from camera and apply some skin detection, binarization, etc. some algorithms. This is the image processing part of the project. Then I plan to apply classification algorithm to identify human hand. To classify identified human hand images, I plan to use deep learning algorithms. Proposed algorithm is shown in Figure 2 in outline.

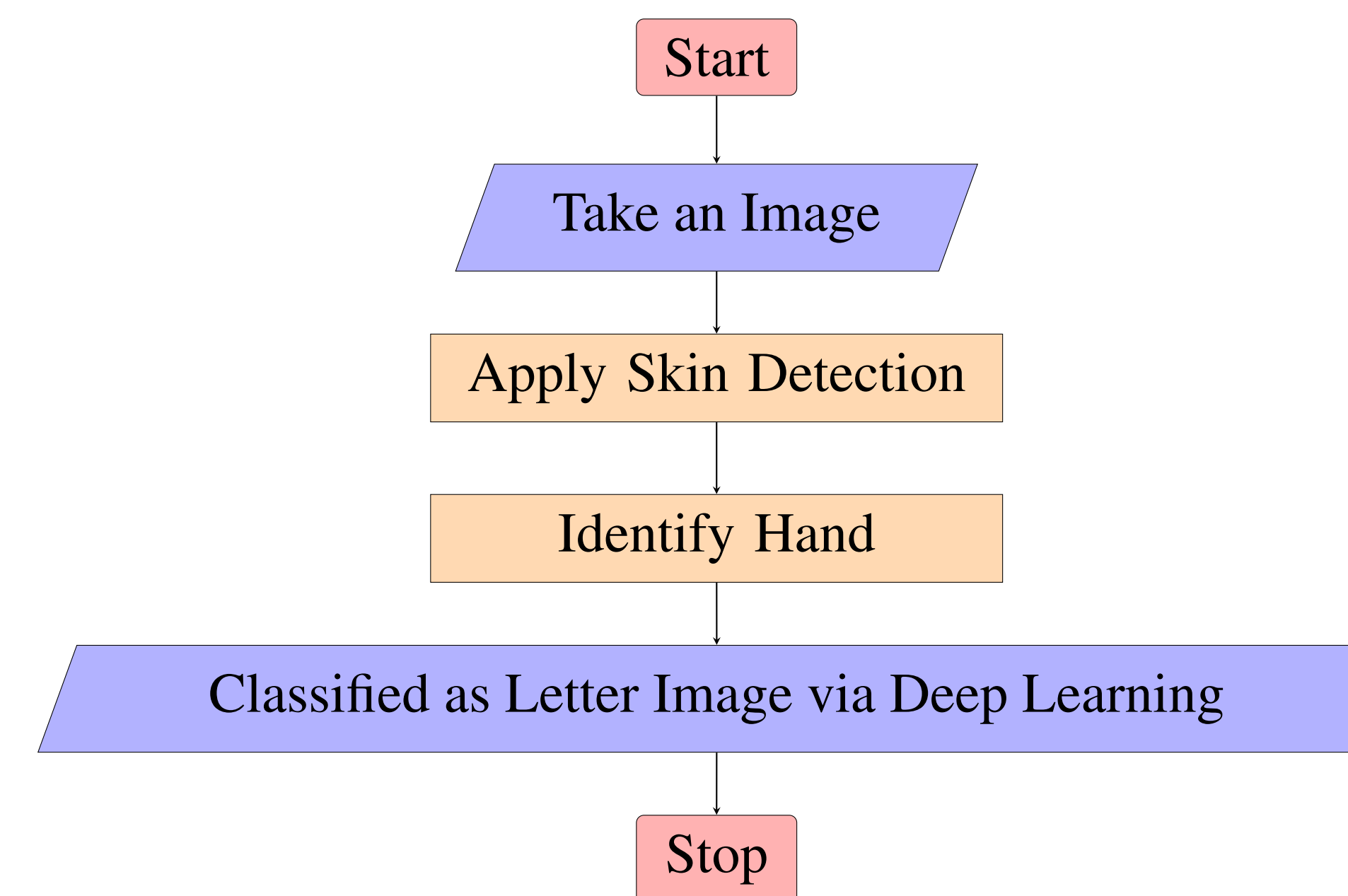


Figure 2: The draft of proposed algorithm

Goal

- Live video detection and conversion of sign language (ASL)
- To text in real time processed images

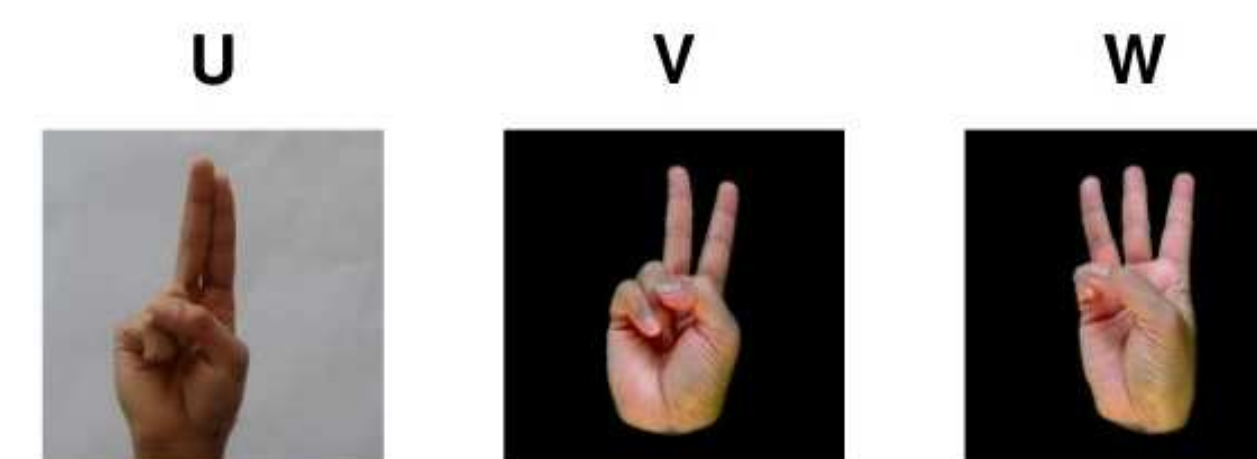


Figure 3: Example expected result in final [2]

References

- [1]. American Sign Language. Retrieved October 17, 2017, from <https://www.nidcd.nih.gov/health/american-sign-language>
- [2]. AI-powered translation of Sign Language into text. Retrieved October 17, 2017, from <https://www.slideshare.net/BelalChaudhary/aipowered-translation-of-sign-language-into-text>