Marc Angeles | Serafin Arboleda | Joseph Hernandez | Zabdiel Garcia
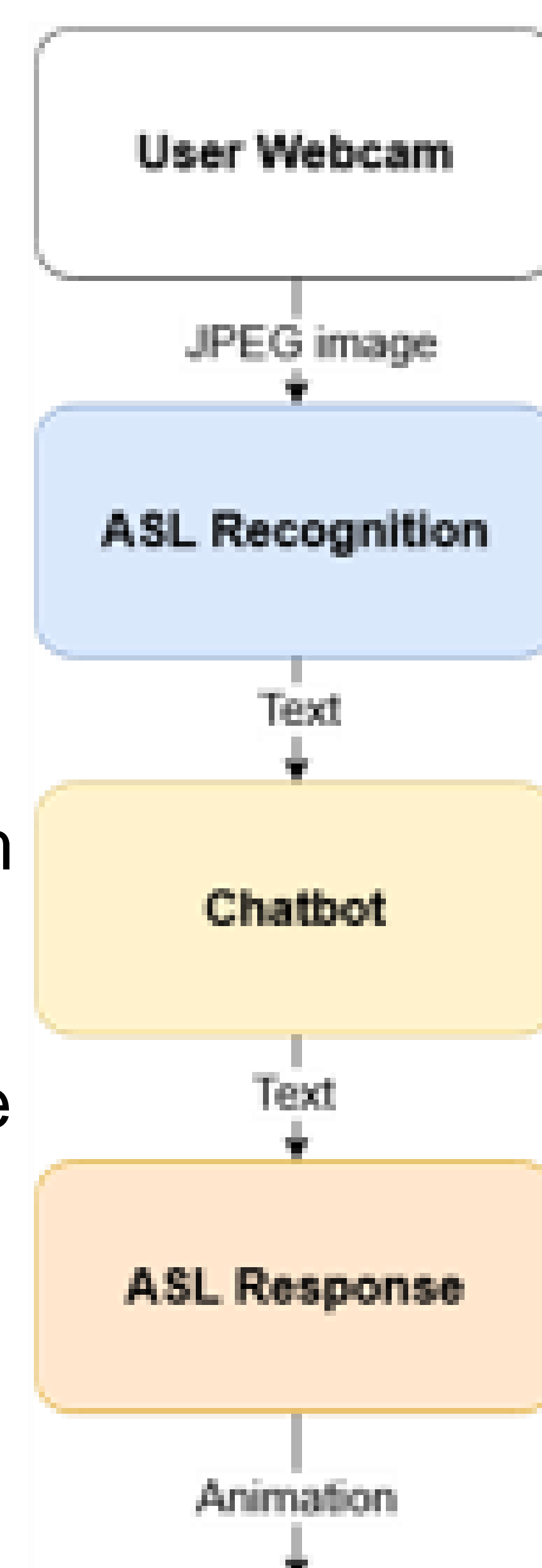
Introduction

ASL is a language that's used by many people from the Deaf and Hard of Hearing Community. ASL is also a language that requires independent practice to learn successfully. We decided to make practicing this language more interactive and engaging by building a web application that can process your ASL gestures and respond back to you. This project will allow for people to independently practice their ASL.
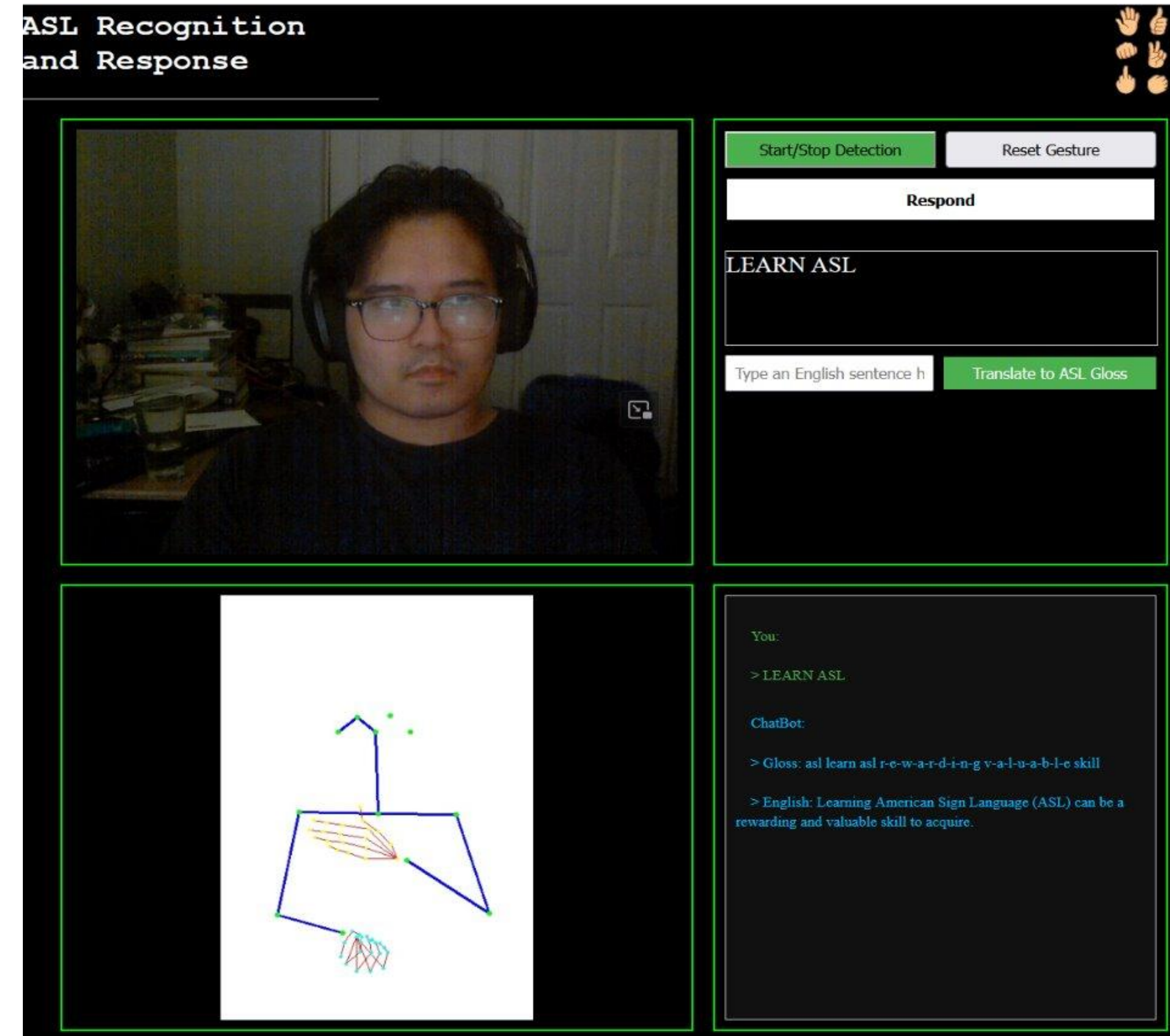
Project Architecture:
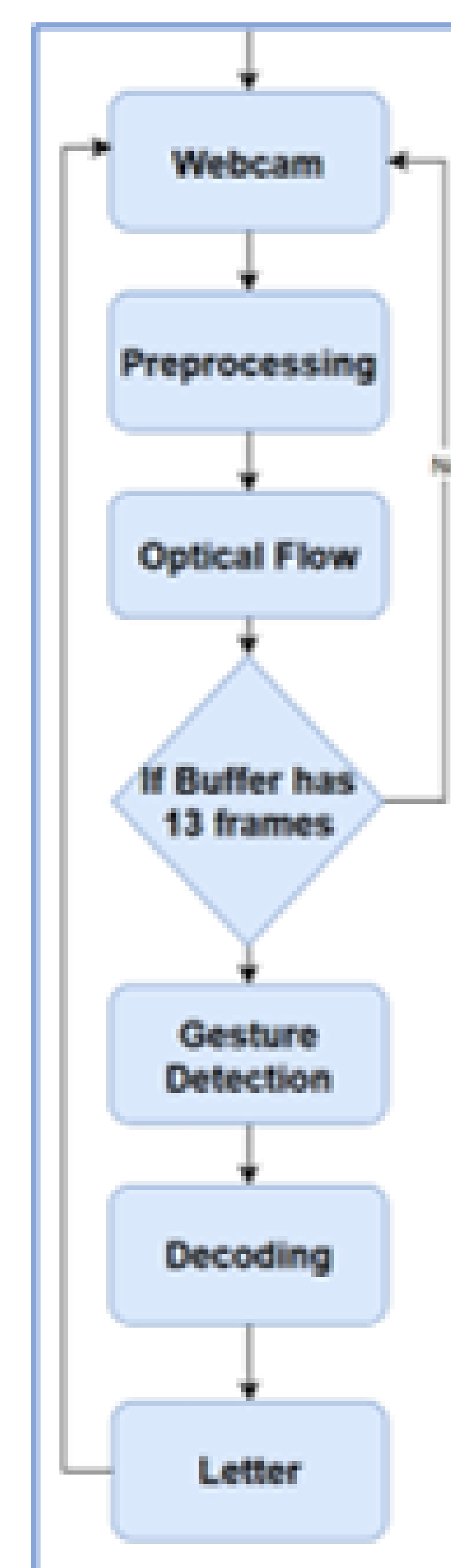
The project is split into three components:
- The ASL recognition portion takes ASL fingerspelling from a webcam
- The chatbot takes the text output from the ASL recognition.
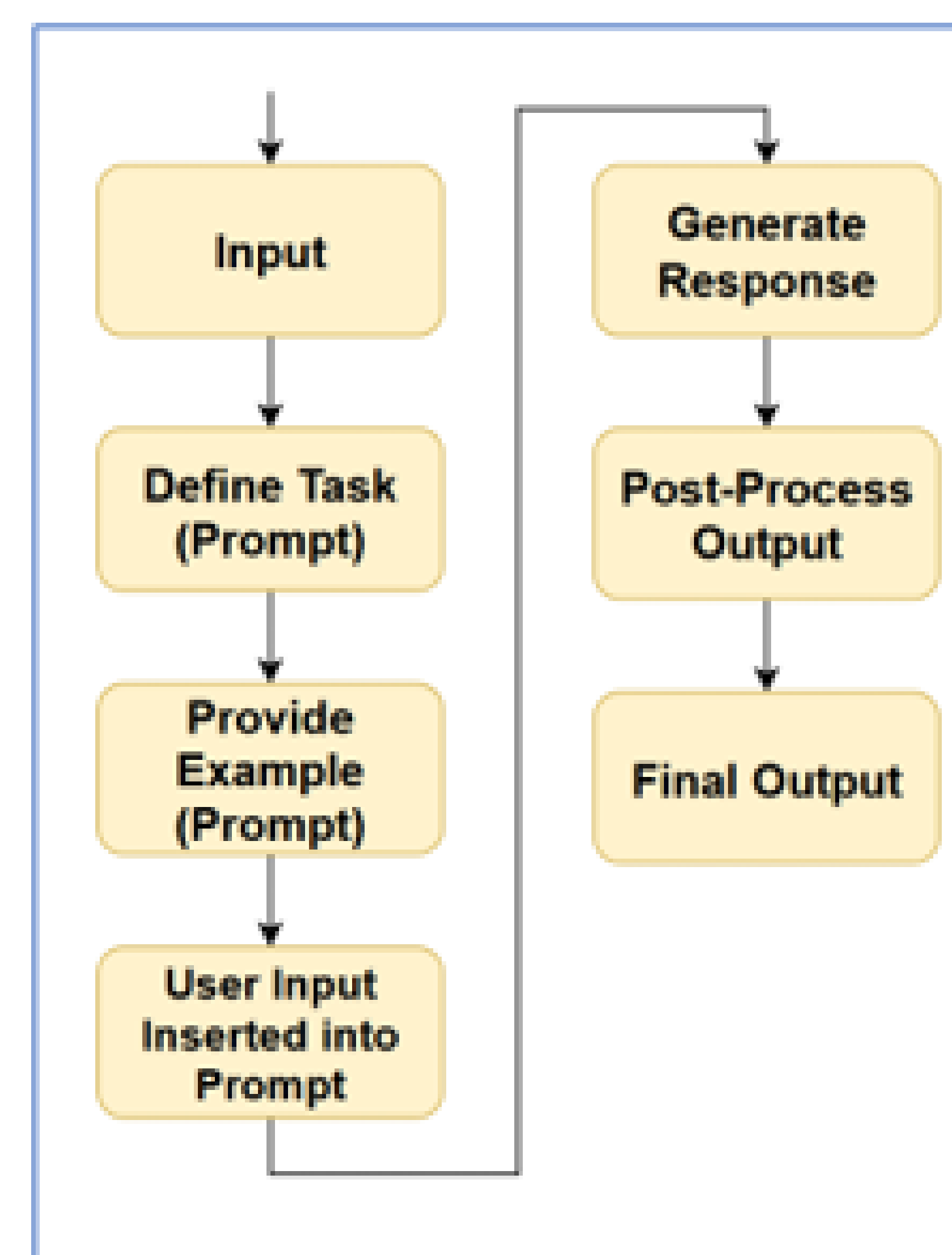- The ASL Response takes output from the chatbot to produce an animation.

Technology Used

Website

The website has two ways to input and get a response. The first way will have you use ASL fingerspelling. The other one will have you insert text into the website to get a specific response that you want from the chatbot. The website uses JavaScript to allow for the camera to gain input. This allows for the buttons to work. The website uses python for it to run. The website also uses flask to allow for all the python programs to work together. The website is hosted on Athena to allow the group to not have any hardware issues with the programs

Recognition

Chatbot

Response

Accessibility

This project is a python-based web application that can be accessed at the URL athena.cs.csubak.edu/asl-rr. Once on the website, you can allow access to your device's local camera and start signing to start the conversation!

Results

We were able to implement our program via a web application to recognize ASL Gestures and respond in ASL formatted text and/or ASL Gestures using a 2D skeleton. All of the Backend processing is done on the Campus' Athena Server.

Acknowledgements

WLASL
- One of the largest ASL dataset. We used their key points data for ASL response

Fmahoudeau
- We utilized their pretrained MiCT-RANet model as the backbone of our recognition pipeline

Dr. Chengwei Lei
- Our sincere thanks for your insightful feedback and encouragement throughout this project

Dr. Alberto C. Cruz
- Thank you for helping us get started on Athena, guiding us through the platform's use as well as maintaining it.