
A Mini Project report on

Text to Sign Language

A report submitted in partial fulfillment of the Academic requirements for the award of the degree.

Bachelor of Technology

in

Computer Science & Engineering

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CERTIFICATE

This is to certify that the project report entitled “**Text to Sign Language**” is a bonafide work done by **B. Mani Chandra (20H51A0506)** , **P. Jagan (20H51A0519)** , **Yoddi Sandeep (20H51A0527)** in partial fulfillment for the award of **Bachelor of Technology** in **Computer Science and Engineering** is a record of bonafide work carried out his/her under my guidance and supervision

The results embodied in this project report have not been submitted to any other University or Institute for the award of any Degree.

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ABSTRACT

Communications between deaf person and a normal person has always been a challenging task. Since normal people are not trained on hand sign language, conveying a message to them is very difficult. The aim of this system is to design an independent communication system for a person who is deaf and hard of hearing. This system is used for converting text in English language to sign language. Sign language has their own alphabets and grammar. The system takes input as alphabets and numerals and converts them into equivalent sign code and displays on a screen. In this project we used python, html, CSS to build a suitable design. By creating a system that converts text to sign code, which is helpful for communication between normal people and hard of hearing the person.

CHAPTER – 1

INTRODUCTION

1.1 INTRODUCTION:

In our daily life, the communication between several different communities is fundamental and very much important to share information. Being able to communicate effectively is a vital life skill but for the people with hearing disability, they find it difficult to understand the message conveyed by the people around them. The process of communication between two people can be done using various medium. Not everyone knows how to interpret a sign language when having a conversation with such community like of deaf or hard of hearing person. One finds it difficult to communicate without an interpreter or some other sources.

We need to convert the text language in language so that it is understood by others and also help them to communicate without any barriers. One of the effective solutions of this difficulty is to convert the English text into sign language. Using sign language different gestures of hand are used to express meaningful information. Language of sign is different in different parts of world. There are 135 sign languages prevalent throughout the world for communication. Each sign language is different from the other like American Sign Language used in America is different from the Indian Sign Language of India. As there is a particular hand gesture for every English alphabet, we take the input in English language (as text) and provide an equivalent symbols of sign language.

This project is aimed to provide a platform to an ordinary person to communicate with a deaf or hard of hearing person with least confusion. So we designed a web application in which an ordinary person gives the text as input in the English language and in response there will be an equivalent symbols of sign language which states the same meaning that of the text in English.

1.2 OBJECTIVE:

As the Project – “Text to Sign Language” is aimed to deliver an easy way for an ordinary person to convey his thoughts to a deaf or hard of hearing person, the Objectives of the project rely upon the factors that abide to give the best User experience and immense pleasure to the user of the web application.

The main objectives of Text to Sign Language are:

1. Provide platform for an ordinary person to communicate with a deaf or hard of hearing person.
2. Provide a user-friendly webpage for the user.
3. The result for the text provided by the user is accurate.
4. The result for the text provided by the user is clear.
5. Providing handy features to the users.

1.3 SCOPE:

We see many technological advancements in the society where we can send a huge amount of data from one device to another in a fraction of seconds using internet. So, user can use this application with any device which has access to the internet.

This application is most useful for the illiterates who are very poor in understanding script of any common language. Communicating with hearing impaired people in common places like railway stations, bus stands, banks, hospitals etc is very difficult because a vocal person may not know the sign language and thus won't be able to convey any message to hearing impaired person.

CHAPTER-2

BACKGROUND WORK

2.1 EXISTING SYSTEMS

2.1.1: SIGN LANGUAGE RECOGNITION

Now-a-days there are many web applications across the Internet for sign language recognition and translation. They provide an instant result for the user's data. But, using these type of application, the User may not have promising result or output from these applications. Sign language recognition system is one of them. The services or features provided by these applications might not always be efficient from an end user point of view.

Most of these applications provide a good helping hand to the user but fail to reach the end user expectations. Like, most of the times, the application is not an Open-source project, so the user cannot save or own their work and effort as they might have to pay the application provider for access to its features. And sometimes, there are not enough features or designs which the user wished for. There many such cases which might not fulfill the end user's choice.

In sign language recognition system the input is taken from the user (here deaf and dumb person) in video format and the equivalent text in English will be shown on the screen and vice versa. But the problem is the accuracy is very much low and as it was developed as mobile application and web application so there is a chance of lag and advertisements or payment for using the app.

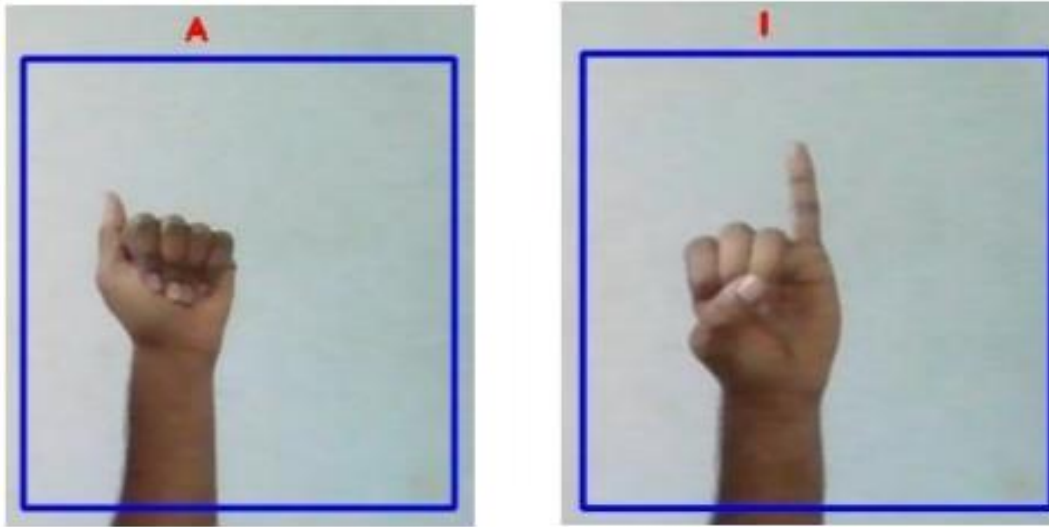


Fig 2.1 Sign language recognition

2.1.2: SIGN LANGUAGE TRANSLATOR

Sign language translator is an web application which takes the input data as text in English language and converts it into equivalent sign language symbols and displays it on the screen. But this web application shows many advertisements as shown in the figure 2.2. As there are many advertisements in the page it is hard for a user to use the website and in some urgent cases ads might delay the process of translation.

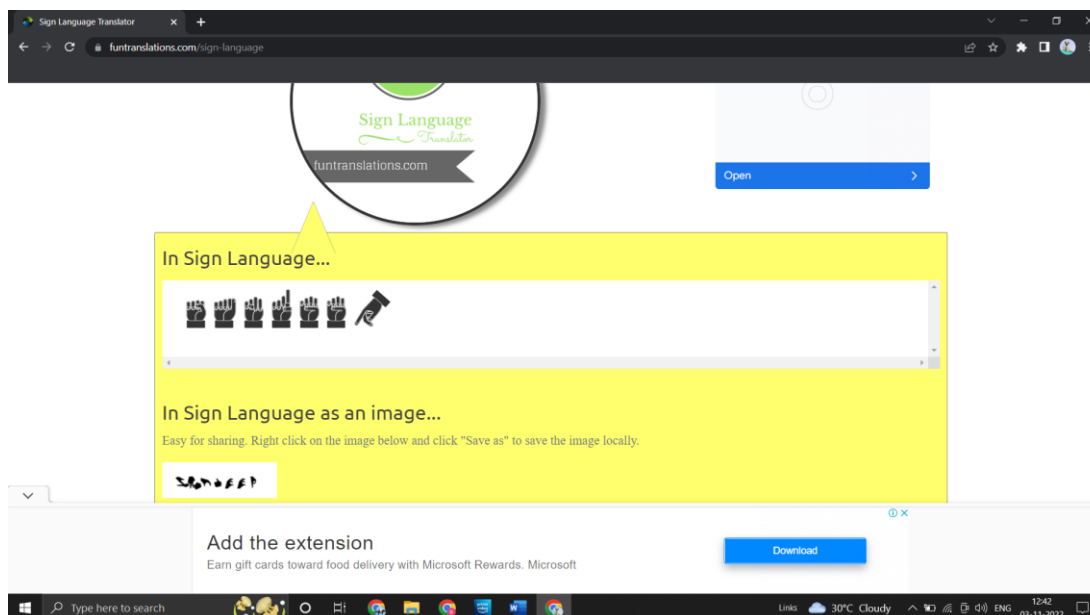
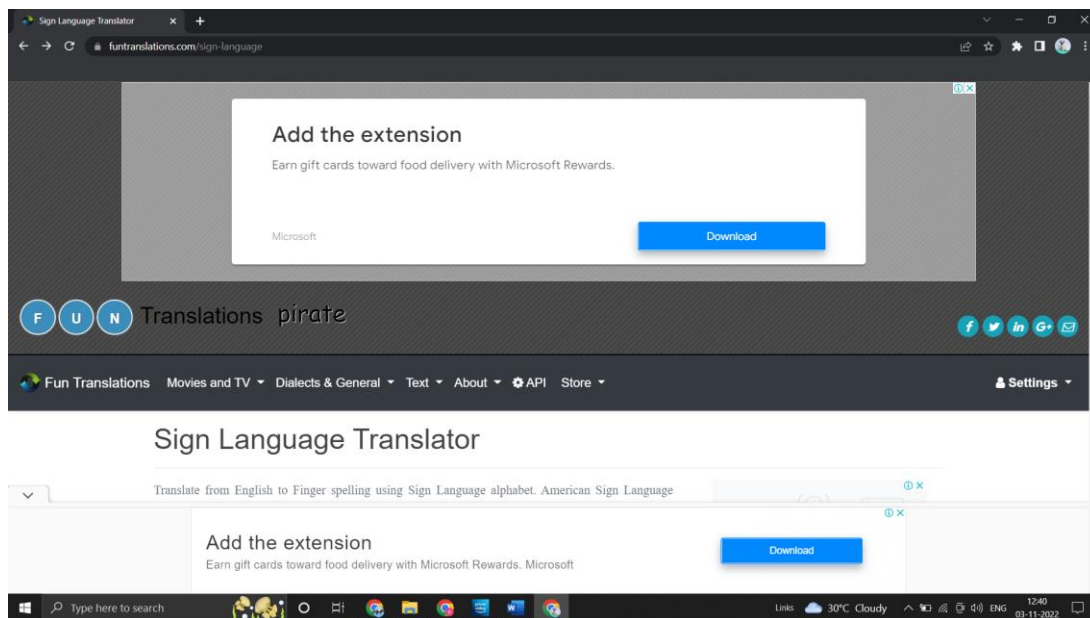


Fig 2.2 sign language translator

Domain and Audience:

The existing solutions targeted the ordinary people to communicate with the deaf and dumb people. Though the web applications or mobile applications based on sign language recognition are easily available on internet, but the accuracy of the output or result is not upto expected by the end user. The persons who has a mobile or computer can easily use the above application but they must have tolerate the advertisements that show up.

Features

The Features included in above existing solutions are as follows:

- 1) Instant processing of data after completion of user inputs.
- 2) Generating equivalent sign language symbols on screen for the input text given in English language.
- 3) Generating equivalent English text on screen for the input given in sign language hand gestures.

Drawbacks

Along with the features, there a couple of drawbacks which are slowing down the trend of using sign language translators. They are:

1. The result or output is not always matching to the user's vision or expectation.
2. Limited services or add-on features are provided in the applications.
3. The results are not accurate in case of sign language to text translators.
4. Not all applications are Open source. Most of them are paid applications.

CHAPTER-3

PROPOSED SYSTEM

3.1 Overview

The web application acts as a platform where a user (here an ordinary person) can provide the text in English language that he wants to translate it to sign language. The user can type the text in the provided text field which mentioned as “Enter your text:”. The important thing to mention is the user can give input text consisting maximum of 40 (forty) English alphabets.

Based on the data the user had provided to the application, the data is then processed by the application accurately as all the work is done by the application alone so there is no chance of error discrepancy in the process. The application is designed in such a way that it only considers the necessary information that is required for generating an equivalent sign language, or hand gestures which translates the same meaning as given input, which helps in avoiding the chance of redundant data.

Though there are many existing solutions are present in the market, they are not that much accurate to satisfy the end user. The existing translators are very much commercial and the user finds more advertisements than the required content. And they translate only the alphabets but not any direct gestures which represent a complete word with translating it one by one.

This Platform provides accurate results as well as simple direct gestures to some commonly used English words like hello, please, no etc. This project is mainly targets the deaf or hard of hearing persons who are actually illiterate and cannot read text in any language.

3.2 REQUIREMENTS:

The web application that is to be deployed and made few software requirements. The basic requirements, we need to develop a good web application are:

Git hub Repository

GitHub, Inc. is a provider of Internet hosting for software development and version control using Git. It offers the distributed version control and source code management (SCM) functionality of Git, plus its own features. It provides access control and several collaboration features such as bug tracking, feature requests, task management, continuous integration and wikis for every project.

GitHub offers its basic services free of charge. Its more advanced professional and enterprise services are commercial. Free GitHub accounts are commonly used to host open-source projects. Projects on GitHub.com can be accessed and managed using the standard Git command -line interface; all standard Git commands work with it. GitHub.com also allows users to browse public repositories on the site. Multiple desktop clients and Git plugins are also available. The site provides social networking-like functions such as feeds, followers, wikis (using wiki software called Gollum) and a social network graph to display how developers work on their versions ("forks") of a repository and what fork (and branch within that fork) is newest.

Anyone can browse and download public repositories but only registered users can contribute content to repositories. With a registered user account, users are able to have manage repositories, submit contributions to others' repositories, and review changes

Heroku app

Heroku is a cloud platform as a service (PaaS) supporting several programming languages. One of the first cloud platforms, Heroku has been in development since June 2007, when it supported only the Ruby programming language, but now supports Java, Node.js, Scala, Clojure, Python, PHP, and Go. For this reason, Heroku is said to be a polyglot platform as it has features for a developer to build, run and scale applications in a similar manner across most languages.

The applications that are run on Heroku typically have a unique domain used to route HTTP requests to the correct application container or dyno. Each of the dynos are spread across a "dyno grid" which consists of several servers. Heroku's Git server handles application repository pushes from permitted users.

Heroku also provides custom build packs with which the developer can deploy apps in any other language. Heroku lets the developer scale the app instantly just by either increasing the number of dynos or by changing the type of dyno the app runs in.

Visual Studio Code

Visual Studio Code is a freeware source-code editor made by Microsoft for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git. Users can change the theme, keyboard shortcuts, preferences, and install extensions that add additional functionality.

Visual Studio Code is a source-code editor that can be used with a variety of programming languages, including Java, JavaScript, Go, Node.js, Python and C++. It is based on the Electron framework, which is used to develop Node.js Web applications that run on the Blink layout engine. Visual Studio Code employs the same editor component (codenamed "Monaco") used in Azure DevOps (formerly called Visual Studio Online and Visual Studio Team Services).

Instead of a project system, it allows users to open one or more directories, which can then be saved in workspaces for future reuse. This allows it to operate as a language-agnostic code editor for any language. It supports a number of programming languages and a set of features that differs per language.

3.3 IMPLEMENTATION

The successful implementation of this type of application requires solid support and scrupulous planning especially considering the wide range of impact the system is going to have.

Step 1: Create a GitHub repository

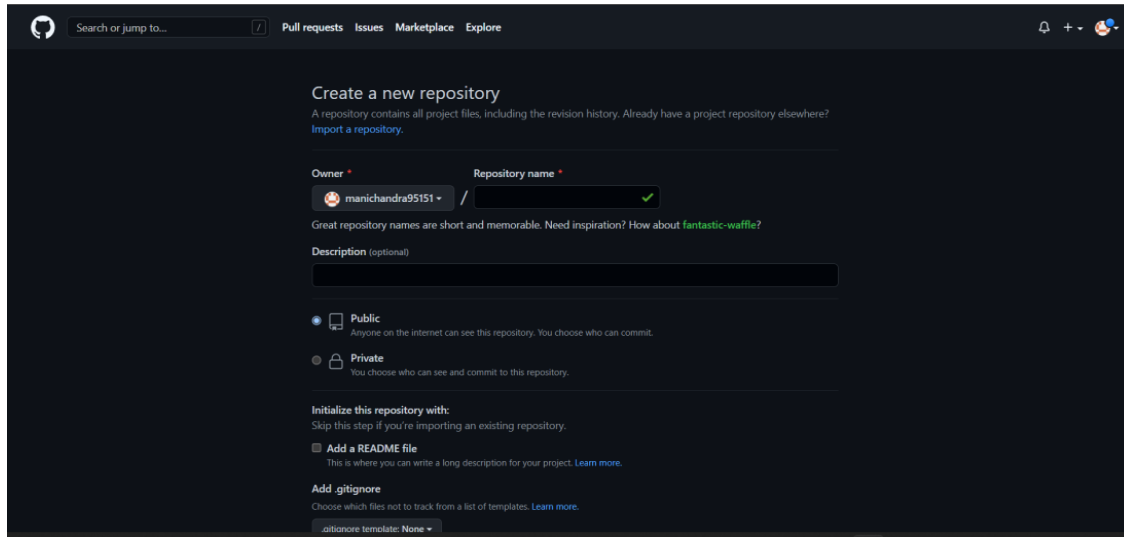


Fig 3.1 Creating GitHub repository

Step 2: Add files from your system

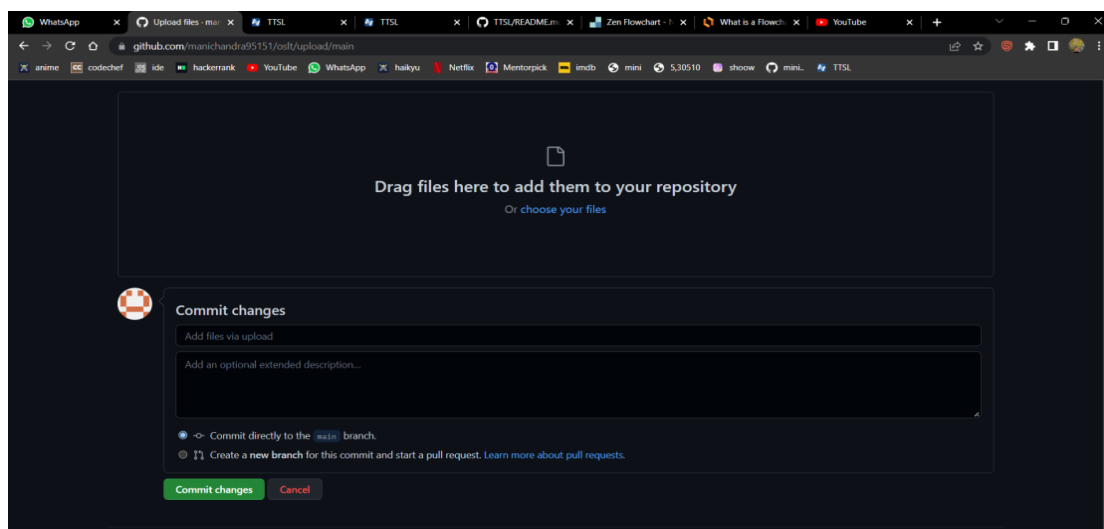


Fig 3.2 Adding files to the repository

Step 3: Added files to the repository

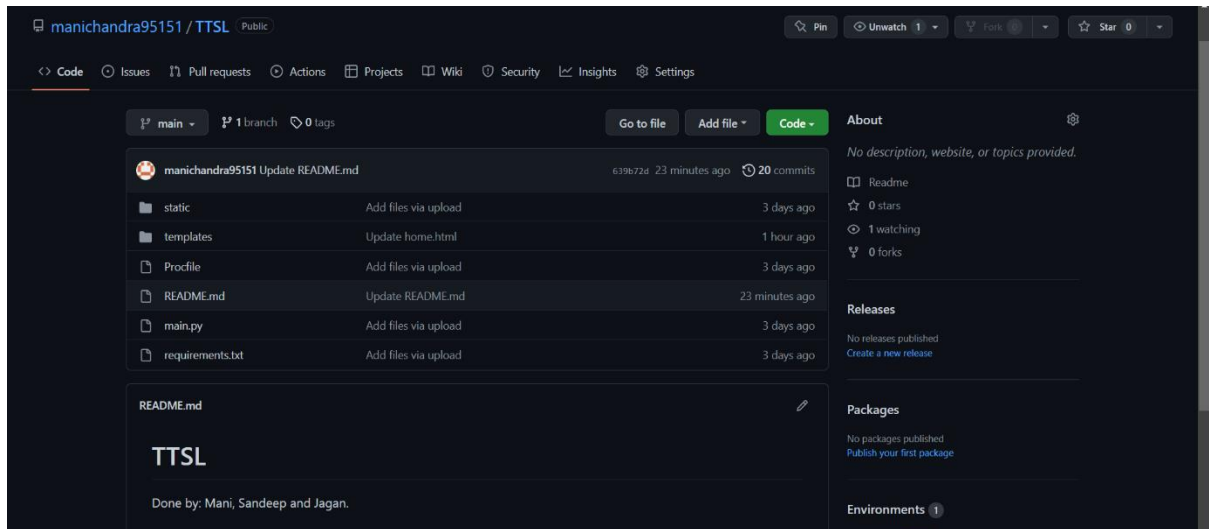


Fig 3.3 Added files to the repository

Step 4: Create a new app name in the Heroku

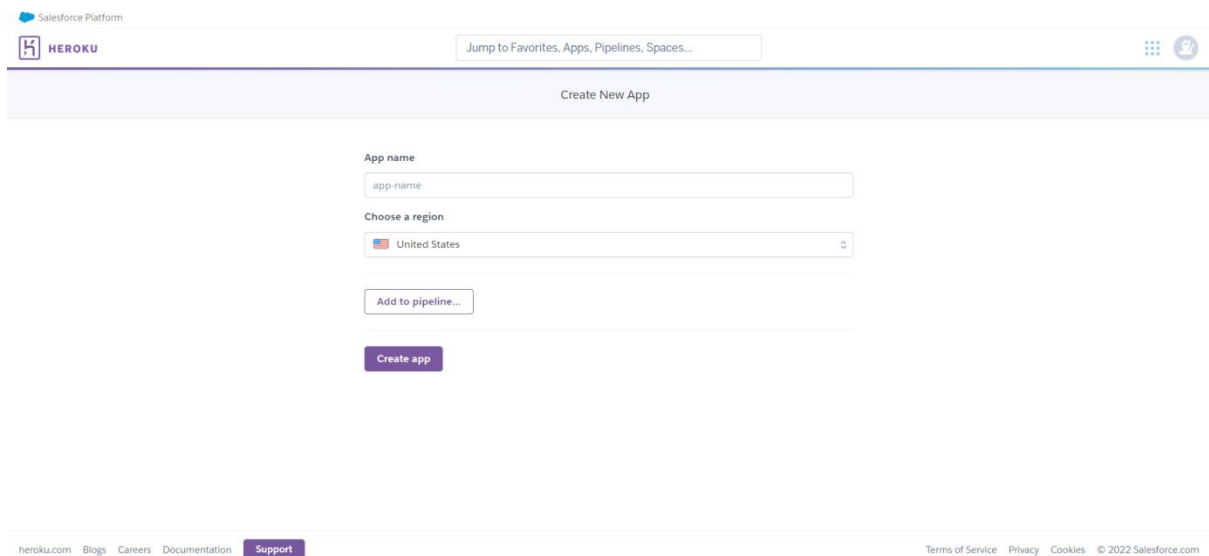
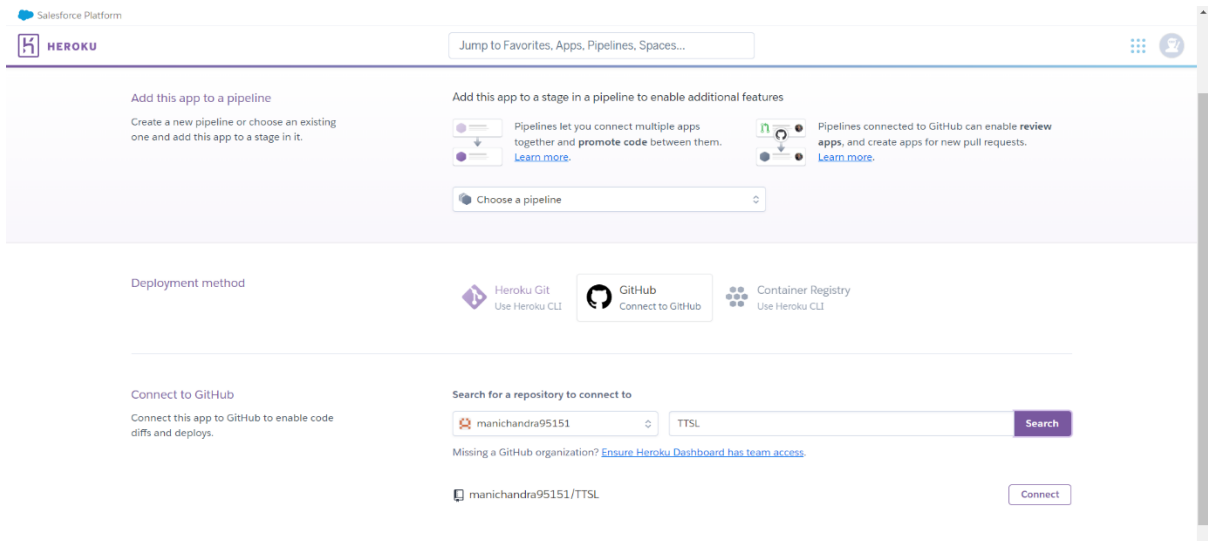


Fig 3.4 Creating new app in Heroku

Step 5: Choose deploy method as GitHub and connect by searching your repository



Salesforce Platform

HEROKU

Jump to Favorites, Apps, Pipelines, Spaces...

Add this app to a pipeline
Create a new pipeline or choose an existing one and add this app to a stage in it.

Add this app to a stage in a pipeline to enable additional features

Pipelines let you connect multiple apps together and **promote code** between them. [Learn more.](#)

Pipelines connected to GitHub can enable **review apps**, and create apps for new pull requests. [Learn more.](#)

Choose a pipeline

Deployment method

Heroku Git
Use Heroku CLI

GitHub
Connect to GitHub

Container Registry
Use Heroku CLI

Connect to GitHub
Connect this app to GitHub to enable code diffs and deploys.

Search for a repository to connect to

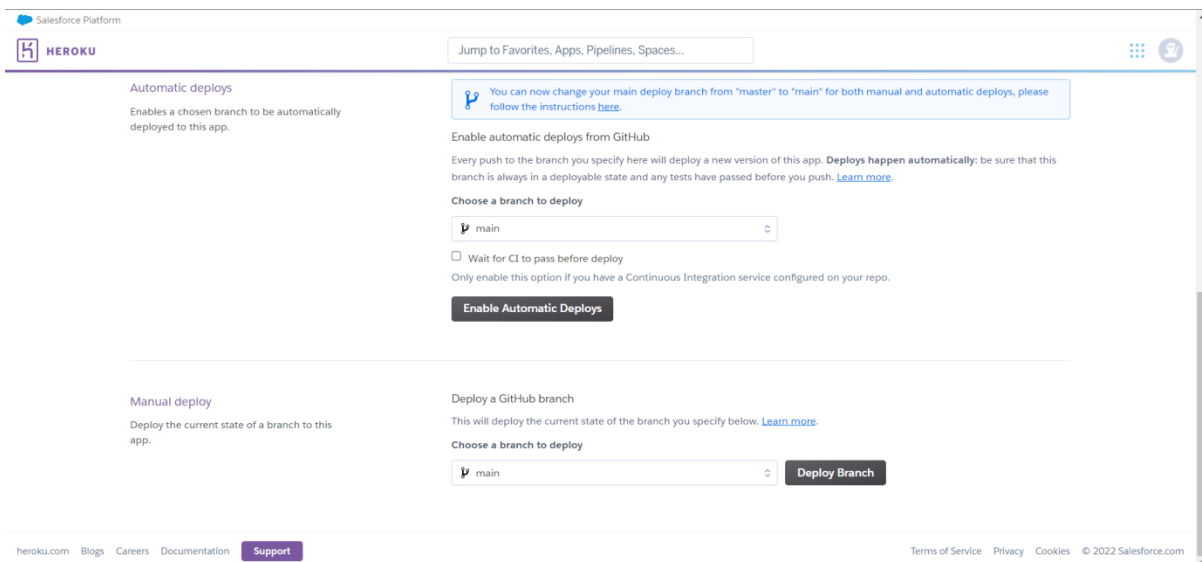
manichandra95151 TSSL [Search](#)

Missing a GitHub organization? [Ensure Heroku Dashboard has team access.](#)

manichandra95151/TSSL [Connect](#)

Fig 3.5 Connect GitHub repository

Step 6: Deploy main branch



Salesforce Platform

HEROKU

Jump to Favorites, Apps, Pipelines, Spaces...

Automatic deploys
Enables a chosen branch to be automatically deployed to this app.

You can now change your main deploy branch from "master" to "main" for both manual and automatic deploys, please follow the instructions [here](#).

Enable automatic deploys from GitHub
Every push to the branch you specify here will deploy a new version of this app. **Deploys happen automatically:** be sure that this branch is always in a deployable state and any tests have passed before you push. [Learn more.](#)

Choose a branch to deploy

main

☐ Wait for CI to pass before deploy
Only enable this option if you have a Continuous Integration service configured on your repo.

[Enable Automatic Deploys](#)

Manual deploy
Deploy the current state of a branch to this app.

Deploy a GitHub branch
This will deploy the current state of the branch you specify below. [Learn more.](#)

Choose a branch to deploy

main [Deploy Branch](#)

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Fig 3.6 Deploy main branch

CHAPTER-4

DESIGNING

4.1 DESIGN:

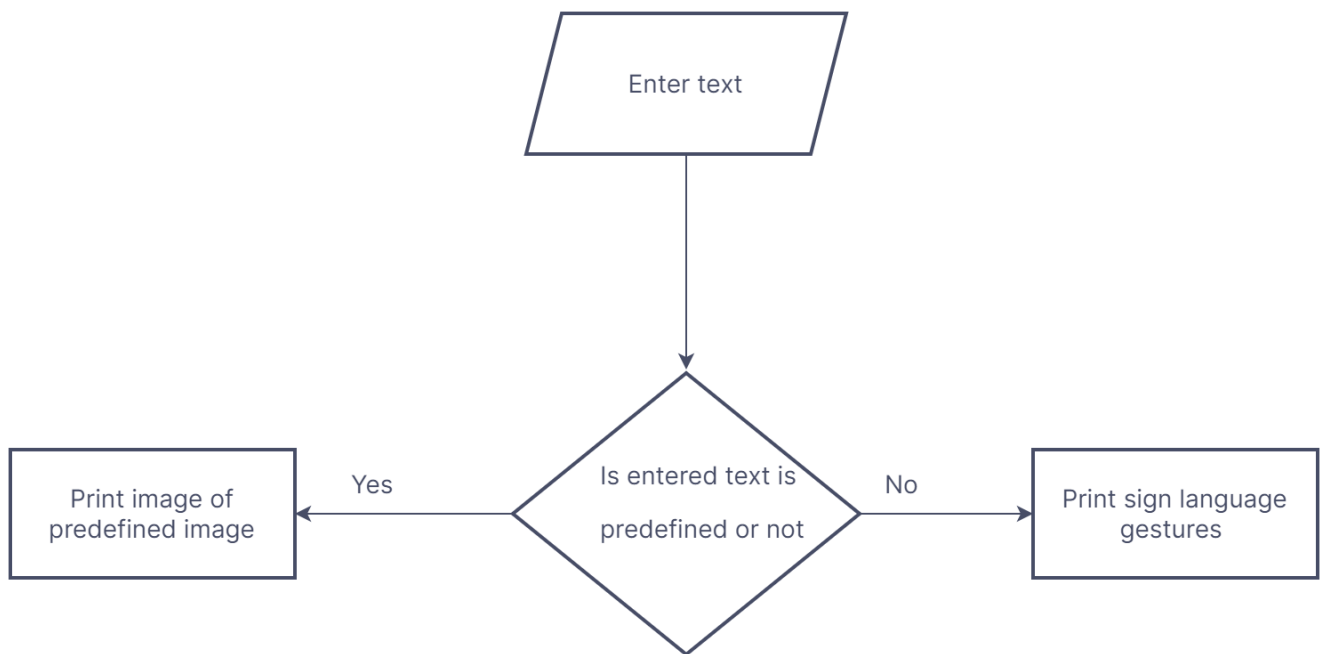


Fig 4.1 Flow chart

4.2 SOURCE CODE:

```
from _future_ import division

# Import Flask

import flask

import requests

import os

from flask import send_file

import re

import sys

# Create the application
app = flask.Flask(__name__)

# serving home.html

@app.route('/', methods=['GET'])
def serve_page():
    return flask.render_template('home.html')

# process query

@app.route('/process_query', methods=['POST'])
def process_query():
    data = flask.request.form # is a dictionary
    input = data['user_input']
    input_in_list = input.split(' ')
    return flask.render_template('home.html', same=processInput(input_in_list), og=input)
```

```
def processInput(input_in_list):
    for s, i in enumerate(input_in_list):
        if "bye" in i.lower():
            input_in_list[s] = "static/bye.jpg"

        if "hello" in i.lower():
            input_in_list[s] = "static/hello.png"

        if "yes" in i.lower():
            input_in_list[s] = "static/yes.png"

        if "no" in i.lower():
            input_in_list[s] = "static/no.png"

        if "please" in i.lower():
            input_in_list[s] = "static/please.png"

        if "thanks" in i.lower():
            input_in_list[s] = "static/thanks.png"

        if "who" in i.lower():
            input_in_list[s] = "static/who.png"

        if "what" in i.lower():
            input_in_list[s] = "static/what.png"

        if "when" in i.lower():
            input_in_list[s] = "static/when.png"

        if "where" in i.lower():
            input_in_list[s] = "static/where.png"

        if "why" in i.lower():
            input_in_list[s] = "static/why.png"

        if "which" in i.lower():
            input_in_list[s] = "static/which.png"

        if "how" in i.lower():
            input_in_list[s] = "static/how.png"

    return input_in_list
```

```
@app.route('/speech', methods=['GET'])  
  
def main():  
    language_code = 'en-US'  
  
if __name__ == '__main__':  
    app.run(debug=True)
```

CHAPTER-5

RESULT AND DISCUSSIONS

5.1 RESULTS:

The home page of the web application will appear as shown in the figure below.

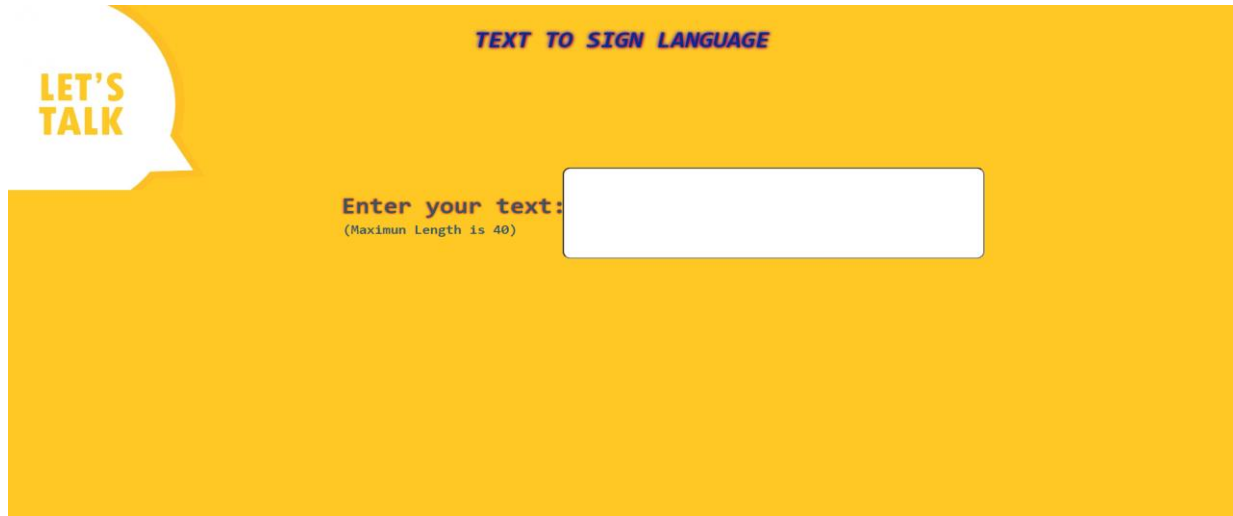


Fig. No 5.1 Home Page

Then user need to enter the text in english which he/she wants to translate it into the sign language hand gestures. The maximum length of the string that the user can enter is 40.

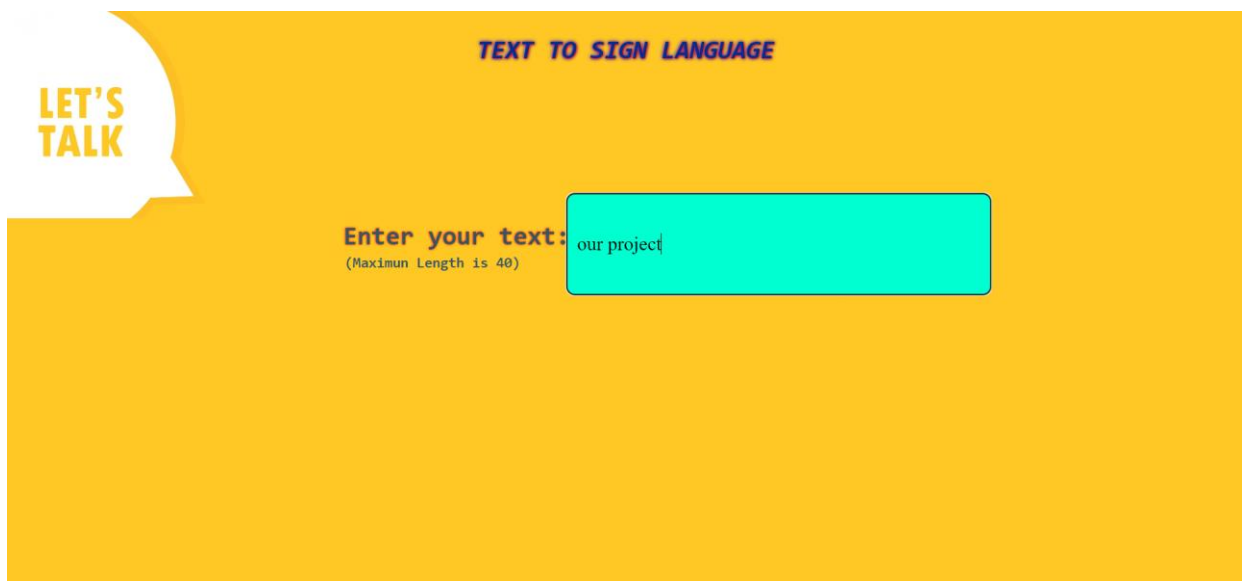


Fig. No 5.2 Taking input from the user

Then, the user need to press 'enter' key.



Fig. No 5.2 Displaying output

CHAPTER-6

SUMMARY &

CONCLUSION

6.1 CONCLUSION:

The Web Application serves an online Virtual Platform for the ordinary people to communicate with the deaf and hard of hearing with least confusion in conveying thoughts. In this application, the user input not only translates English alphabets to sign language but also displays famous hand gestures which conveys entire word like hello, how, please, no etc.

This application presently converts text to sign language but in future we can combine this project with sign language recognition and enable two-way communication. And for the illiterate people we can provide an option of giving input in audio format and then convert it into sign language. We can also modify this application to take input in many languages other than English.

Finally, this web application acts as bridge between an ordinary person and a deaf and hard of hearing person.

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- <https://www.geeksforgeeks.org/python-requests-tutorial/>
- <https://fontsfree.net/american-sign-language-font-download.html>