Project Report

Online Class For Deaf And Dumb

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Submitted to:

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

DECLARATION

I hereby declare that the project entitled ONline Class For Dumb And Deaf submitted by us to the School of Computer Science and Engineering, Vellore Institute of Technology - Chennai Campus, 600 127. In partial fulfillment of the requirements of the award of the course of SWE3999 - Technical Answers for Real World Problems (TARP) is a bona-fide record of the work carried out by us under the supervision of Dr. Geetha S. I further declare that the work reported in this project, has not been submitted and will not be submitted, either in part or in full, for the award of any other degree or diploma of this institute or of any other institute or University.

Place: Chennai Signature of the student

Date:30-11-2021

CERTIFICATE

This is to certify that the report entitled Online Class For Deaf And Dumb prepared and submitted by Uday Kiran N S- 18MIS1040, Sathvik M-18MIS1039, Sai Charan-18MIS1099,Akarsh Vadapalli-18MIS1006, Golla Nobul Kumar - 18MIS1027 to Vellore Institute of Technology - Chennai Campus, In partial fulfillment of the requirements of the award of the course of SWE3999 - Technical Answers for Real World Problems (TARP) is a bonafide record carried out under my guidance. The project fulfils the requirements as per the regulations of this University and in my opinion, meets the necessary standards for submission. The contents of this report have not been submitted and will not be submitted either in part or in full, for the award of any other degree or diploma and the same is certified.

GUIDE: HEAD OF THE DEPARTMENT:

Dr Geetha S Dr Asnath Phamila Y

DATE: DATE:

ACKNOWLEDGEMENT

We are profoundly grateful to Dr Geetha S for her expert guidance and continuous encouragement throughout to see that this project rights its target from its commencement to its completion.

We would like to express our deepest appreciation towards Vellore Institute Of Technology Chennai and Dr Asnath Phamila Y, Head of the Department of Software Engineering whose invaluable guidance supported us in completing this project.

At last, we must express our sincere heartfelt gratitude to our friends and seniors who helped me directly or indirectly during this course of work.

Sathvik M

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ABSTRACT:

Sign language is a visual language use by the deaf and dumb as theor mother tongue, this can used by a person who has difficulties speaking or by a person who can hear but cannot speak and also by normal people to communicate the hearing disabled people. Our project aims to bridge the gap between the deaf and dumb people and as well as the normal people with the advent of web applications, natural language processing.The main purpose of the project is to build an interface which accpets audio as input and converts them to respective sign language.This project builds upon the rules of Indian Sign Language and follows the ISL grammar.

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1.Introduction

1.1OBJECTIVE AND GOAL OF THE PROJECT:

The current indian population is 1.3 billion , in that the population which is vocally impaired and hearing impaired are more than 12.3 million and only 4.5 million can only afford to the schools for the deaf and dumb if available. There was a huge hit back to the whole educational institutions throughout India as well as other countries because of the recent pandemic situation that captivated the whole world. Thereby the mode of education was changed to online which was hard not only for studying but for teaching too. The ISL (Indian Sign Language) is used for communication and also for educational purposes but this has been hard for the dumb and deaf compared to the Oral based online mode of education because the communication is rather done by words than signs. The project helps in decreasing the hardships and increasing the quality of the education of living of this community by intervening and providing this community with a web page that is capable of translating english live audio to sign language and converting text to sign language as well.

1.2 MOTIVATION:

Communication is the most vital part in a person's life and not every individual knows sign language in order to talk with the person from a deaf and dumb community, so the motivation of our project is to help the people who have the problem of speaking or hearing by developing a small scale communication interface which converts live audio and text to sign language.

1.3 PROBLEM STATEMENT:

Due to the inability of communication for the the people of the deaf and dumb community they are not able to participate in any type of public conversations like a seminar, public discussions etc. So in order for them to communicate better with the rest of the world they need a system which will enable the conversion of audio or text to Indian sign language.

1.4 CHALLENGES:

There are a lot of websites that convert audio to text and text to sign language and vice versa , but integrating both these ideas and doing it into a single system was the hardship. And the next one was getting audio without any change in words because many of the inputs might have a chance of getting converted into any other which rhymes with that of the word which was actually said. Taking each sentence and breaking them according to the context of sign language was hard because some of the words really didn't have major meaning towards them when converted to sign language.

Social Impact:

There are roughly 5.07 million persons in India who are deaf. More than a third of them are under the age of 20, with the remainder falling between the ages of 20 and 60. Because these people are typically unable to talk correctly, they interact with others using sign language. Because sign languages lack a well-defined structure or grammar, these signs have no or very little acceptance outside of the limited community of these differently abled persons. Communication is difficult for

hearing-impaired persons in public areas such as train stations, bus stops, banks, and hospitals because a hearing person may not comprehend the sign language used by the deaf person to communicate. Furthermore, a hearing person cannot transmit any message to a deaf person since he or she may not be familiar with sign language. Language translation is required to facilitate communication between the deaf and non-deaf communities. Communication is difficult for the deaf people in common areas such as railways, banks, and hospitals due to their inability. To assist them communicate more effectively with the rest of the world, a system that converts text to Indian Sign Language and vice versa is required. These systems will improve the community's standard of living. Sign languages have not received as much attention as spoken languages, and there is still much to learn about them. is the notion of individuals showing up at a predetermined place, either individually or as a group, for a previously arranged event.

2. Literature Survey:

I Neha Poddar,Shrushti Rao,Shruti Sawant, Vrushali Somavanshi: Study of Sign Language Translation using Gesture Recognition- This project is a small step towards helping physically challenged people and a lot more can be done to make the product more sophisticated, user friendly & efficient. Using more memory and powerful microprocessors, more languages can be covered. This project can be modified to make it compatible with mobile phones. We can increase the range of products by using more powerful trans-receiver modules.

II Pawan Kumar, Savita Khatri: Generating Indian Sign Language Text
Using English/Hindi Text- In this paper, they have compared the existing models for the conversion of plain English/Hindi Text into the Indian Sign Language Text. Most of the systems which have been developed so far are meant to work only for a

single domain. A unified system is needed for the deaf-mute community to help them interact with the normal people in their day to day lives.

III Ankita Harkude, Sarika Namade, Shefali Patil, Anita Morey: Audio to Sign Language Translation for Deaf People- In this paper, they have implemented translation from input audio to sign language. It translates each and every letter in the audio message and it displays each sign language letter. But it is not efficient for future purposes.

Our project is different from literature survey:

- We are trying to provide great User Interface for users to use the system easily
- We will make sure to focus and check on tenses and syntax from the input.
- We will try to display the output in MP4 format.
- We will try to develop our system with unlimited resources

3 .Requirements Specification

3.1 SOFTWARE SPECIFICATIONS:

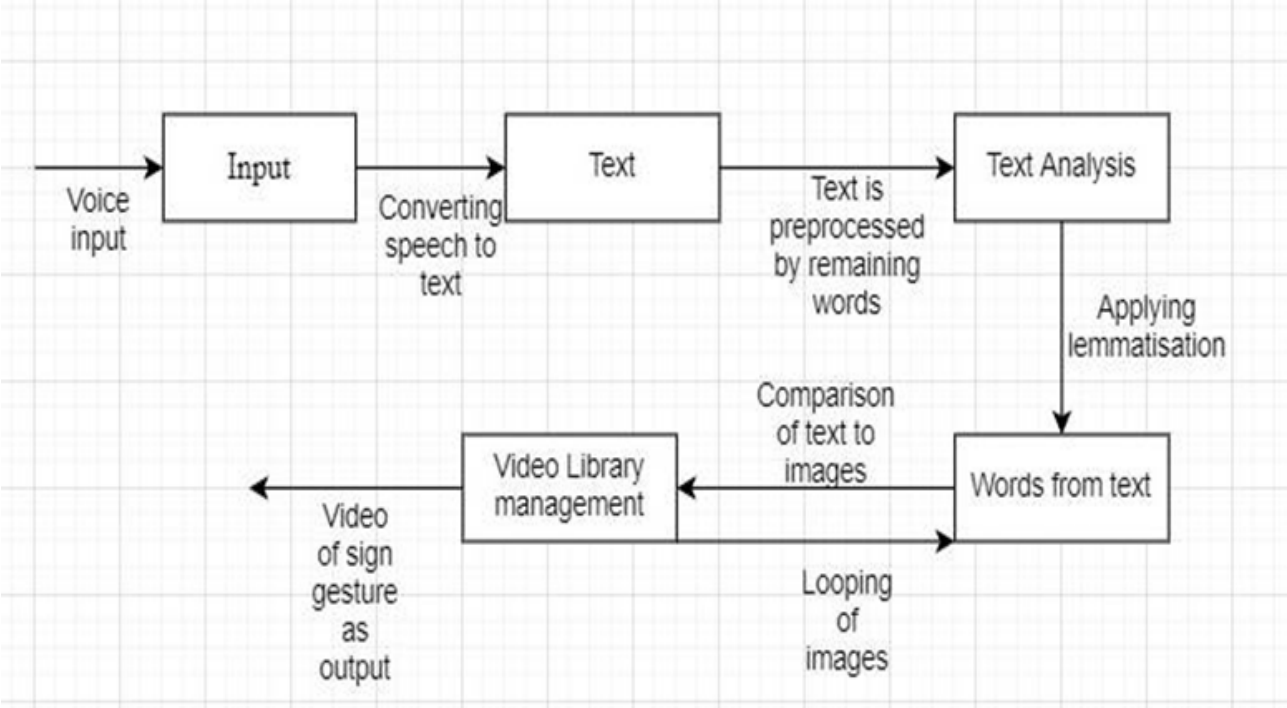
The software requirements for the project are listed below.

Pycharm- It is a IDE used in the computer which is used for specially for python language

Django- It is a python based free and open source web framework that follows a model template views. This django encourages very fast development of the websites.

Python-Purpose interpreted, interactive, object-oriented, and high-level programming language

4. SYSTEM DESIGN:



We have accessed the problem statement and we have decided to create tool that helps to bridge the gap between the normal people and the deaf and dumb comminity poeple.

In thi the input is a live audio and this audio is converted into text and then the text is processed and a more analyzed one is given which further goes through lemmatization and the words from the text are provided and then the comparison of words to images takes place then the vice versa, the checking is done with video library management. Finally a sign gesture is provided as a video.

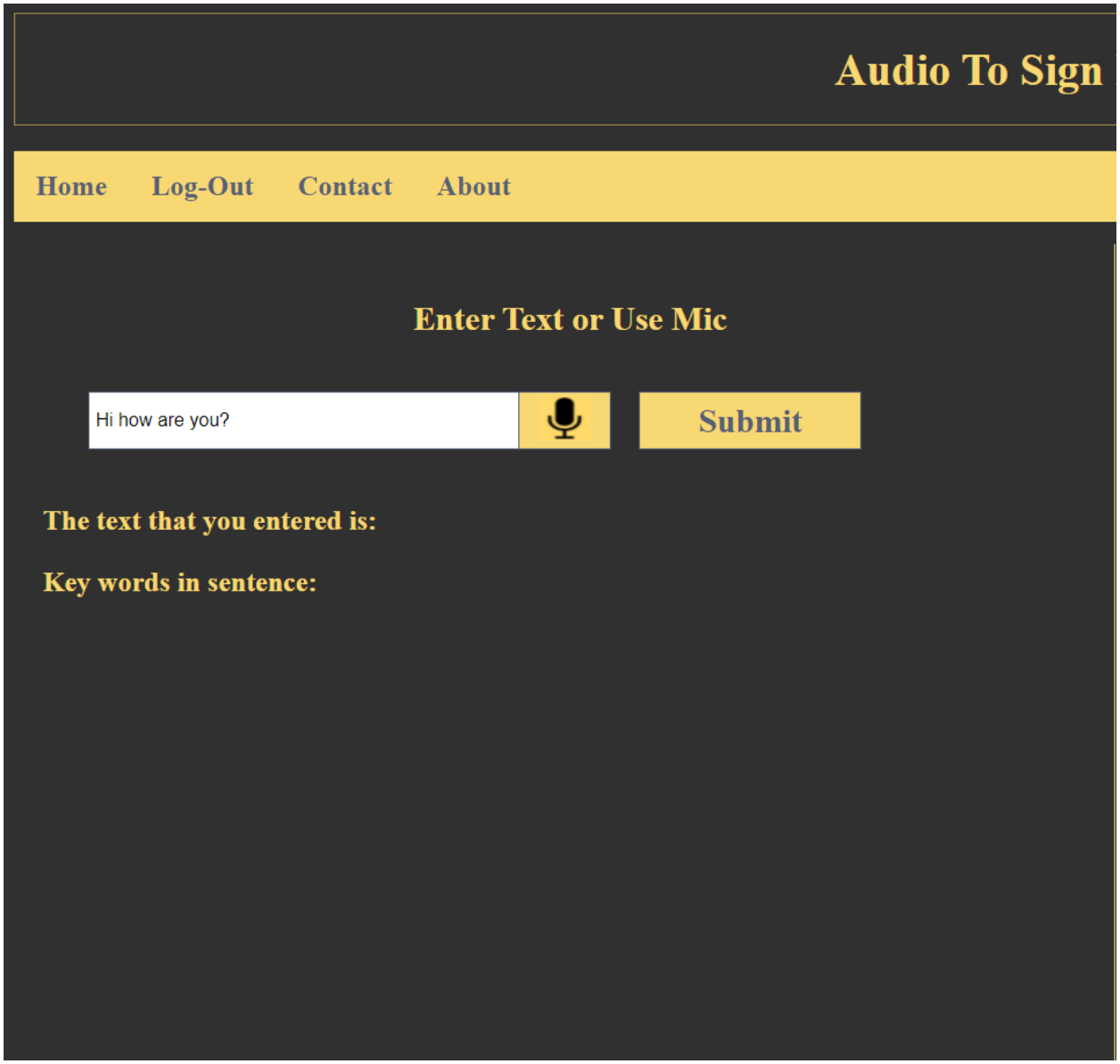
5. Implementation of the System:

We are getting a live audio input using the Webkit speech recognition and then we are converting into the text form so that it will be helpful for us in doing the necessary processes. After getting the audio and converting into the text format , we need to break the words so that we can if they match with the dataset animation gif and display the word so in order to do that we need to break the text sentence , so for that we use POSTagging method which is a natural language processing concept after using this all the words in the sentence will get a specific tense to it and after doing it , the stop words are all removed then the maximum tense of the whole sentence is given to whole sentence. Then using the lemmatization process which is another natural language processing concept, this basically splits the sentence into words and checks if there is a specific word gif , if there then provides it as output else it will further split the word into letters and will provide the output

6. RESULTS AND DISCUSSION:

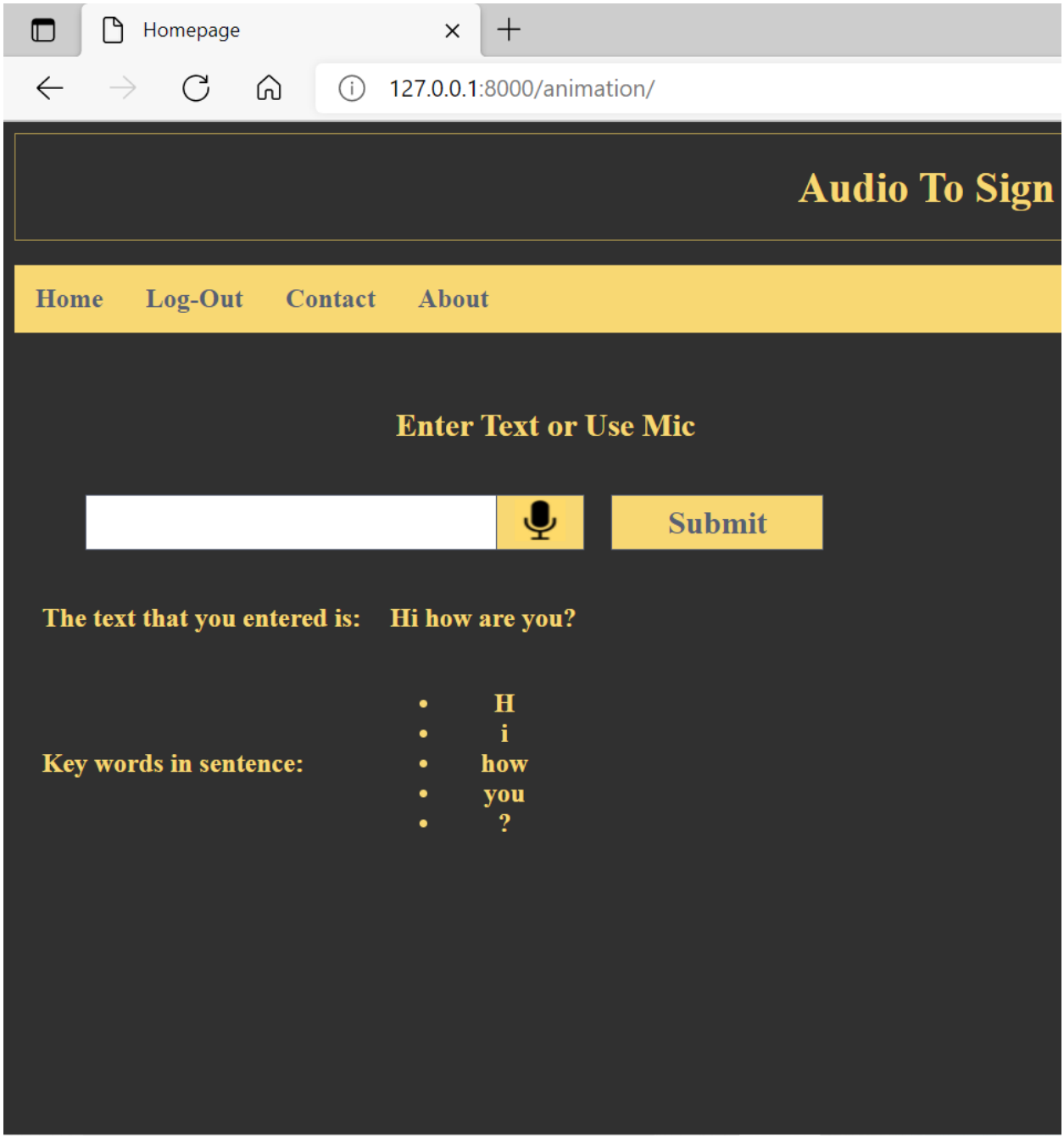
Phase 1:

The conversion of the live english audio is converted to the text

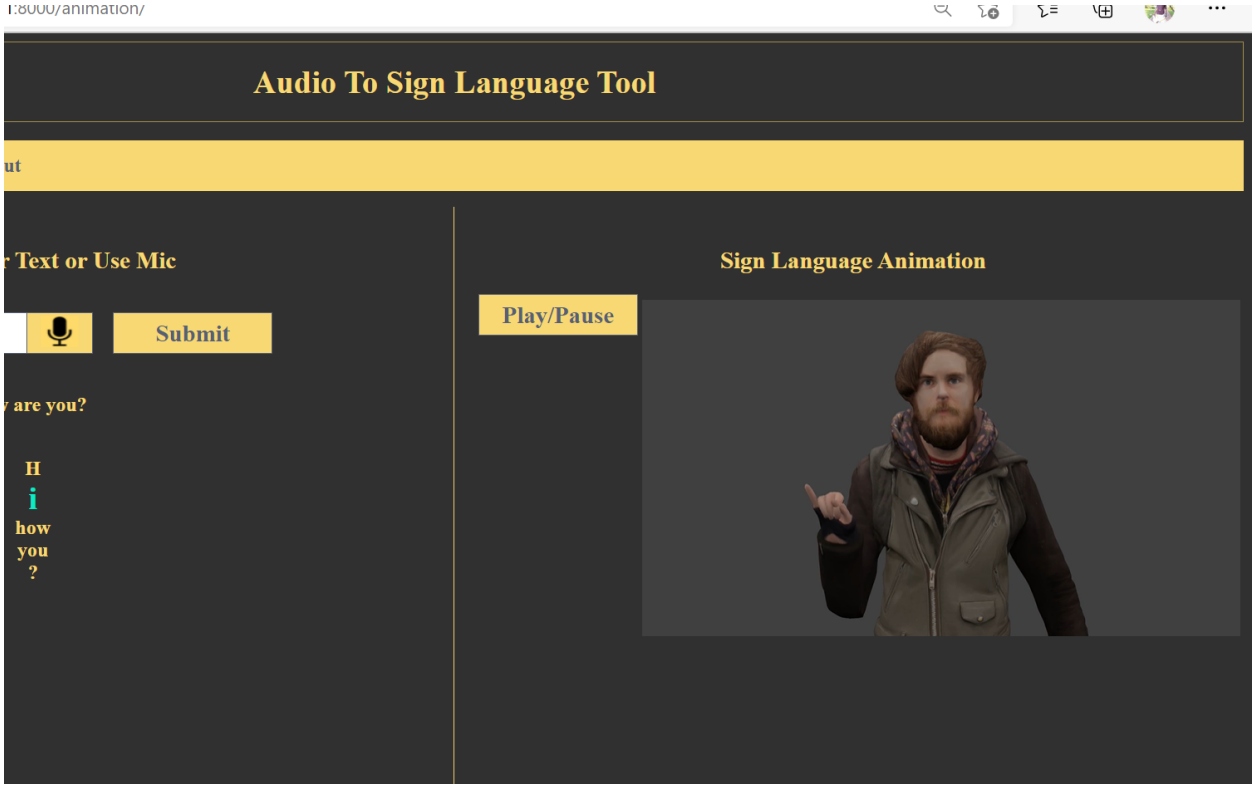


Phase 2:

- The output of the lemmatization process in which the respective splitting is done in accordance to the dataset that we have



- The output of the project will be a clip of ISL gifs which is from a predefined database having video for most of the words and each every alphabest.



7. CONCLUSION AND FUTURE WORK:

Our project will definitely help to remove the communication gap between the society of people and as well as the people from the deaf and dumb society, the tool that we did is a small step from that process, the small step is conversion of live feed audio into text which is currently used for online class for the people of deaf

and deaf community.On a long run we have planned to integrate the project with a database so the inoformtion that have been searched will be saved thereby the person can access it and see whenever they want to infact that is the main reason why the option of setting up one account was created. The next idea is to add more languages detecting and conversion , because not just english is spoken along the world there are a lot of languages which have been spoken so the conversion just being able to convert english is not a big milestone.Now we are able to convert english audio file to sign language, we might add another way in which the sign language also is converted to audio format which is like the reverse of the process that we did. The last one is to be able to capture the direct audio that is like now we are able to take a live audio and then record it in another device but we are planning to make this webpage to detect the audio from the same device and then show it in sign language like the work done by google caption in a google meet.

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9. Appendix:

Views:

```
from django.http import HttpResponse
from django.shortcuts import render, redirect
from django.contrib.auth.forms import UserCreationForm,
AuthenticationForm
from django.contrib.auth import login, logout
import nltk
from nltk.tokenize import word_tokenize
from nltk.corpus import stopwords
from nltk.stem import WordNetLemmatizer
from django.contrib.staticfiles import finders
from django.contrib.auth.decorators import login_required


def home_view(request):
   return render(request, 'home.html')


def about_view(request):
   return render(request, 'about.html')


def contact_view(request):
   return render(request, 'contact.html')


@login_required(login_url="login")
def animation_view(request):
```

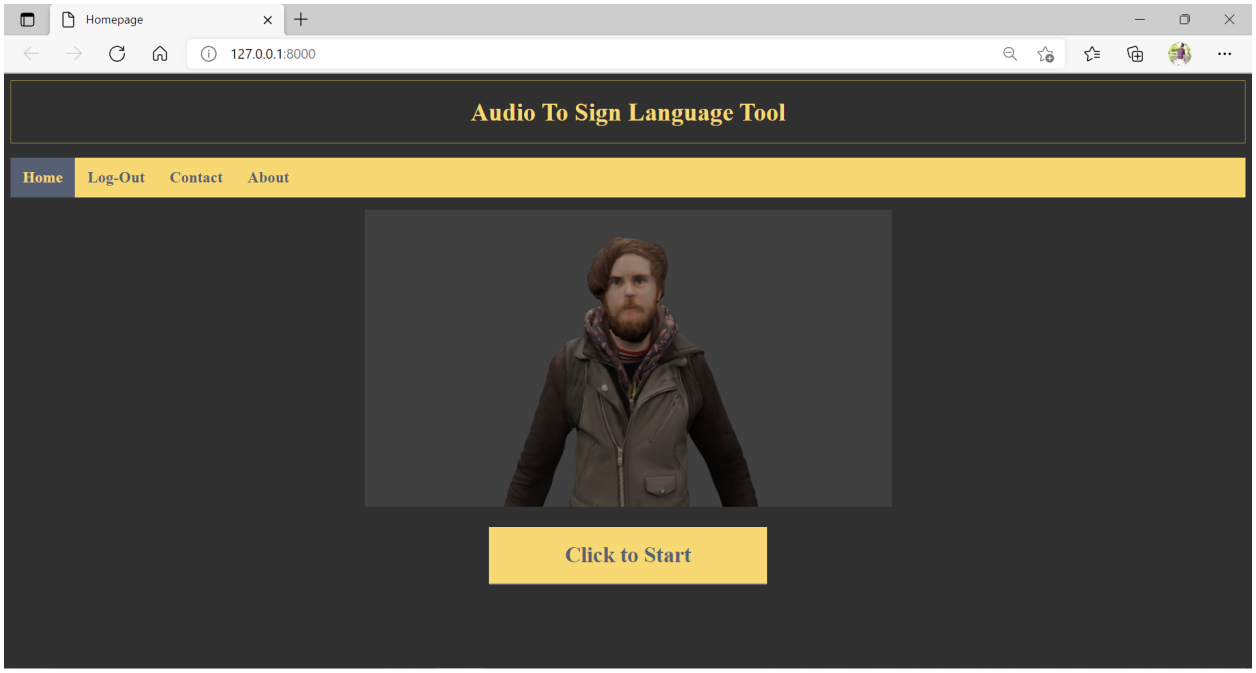
```
    if request.method == 'POST':
        text = request.POST.get('sen')
        # tokenizing the sentence
        text.lower()
        # tokenizing the sentence
        words = word_tokenize(text)

        tagged = nltk.pos_tag(words)
        tense = {}
        tense["future"] = len([word for word in tagged if word[1]
== "MD"])
        tense["present"] = len([word for word in tagged if
word[1] in ["VBP", "VBZ", "VBG"]])
        tense["past"] = len([word for word in tagged if word[1]
in ["VBD", "VBN"]])
        tense["present_continuous"] = len([word for word in
tagged if word[1] in ["VBG"]])

        # stopwords that will be removed
        stop_words = set(
            ["mightn't", 're', 'wasn', 'wouldn', 'be', 'has',
'that', 'does', 'shouldn', 'do', "you've", 'off', 'for',
             "didn't", 'm', 'ain', 'haven', "weren't", 'are',
"she's", "wasn't", 'its', "haven't", "wouldn't", 'don',
             'weren', 's', "you'd", "don't", 'doesn', "hadn't",
'is', 'was', "that'll", "should've", 'a', 'then', 'the',
             'mustn', 'i', 'nor', 'as', "it's", "needn't", 'd',
'am', 'have', 'hasn', 'o', "aren't", "you'll",
             "couldn't", "you're", "mustn't", 'didn', "doesn't",
'll', 'an', 'hadn', 'whom', 'y', "hasn't", 'itself',
             'couldn', 'needn', "shan't", 'isn', 'been', 'such',
'shan', "shouldn't", 'aren', 'being', 'were', 'did',
```

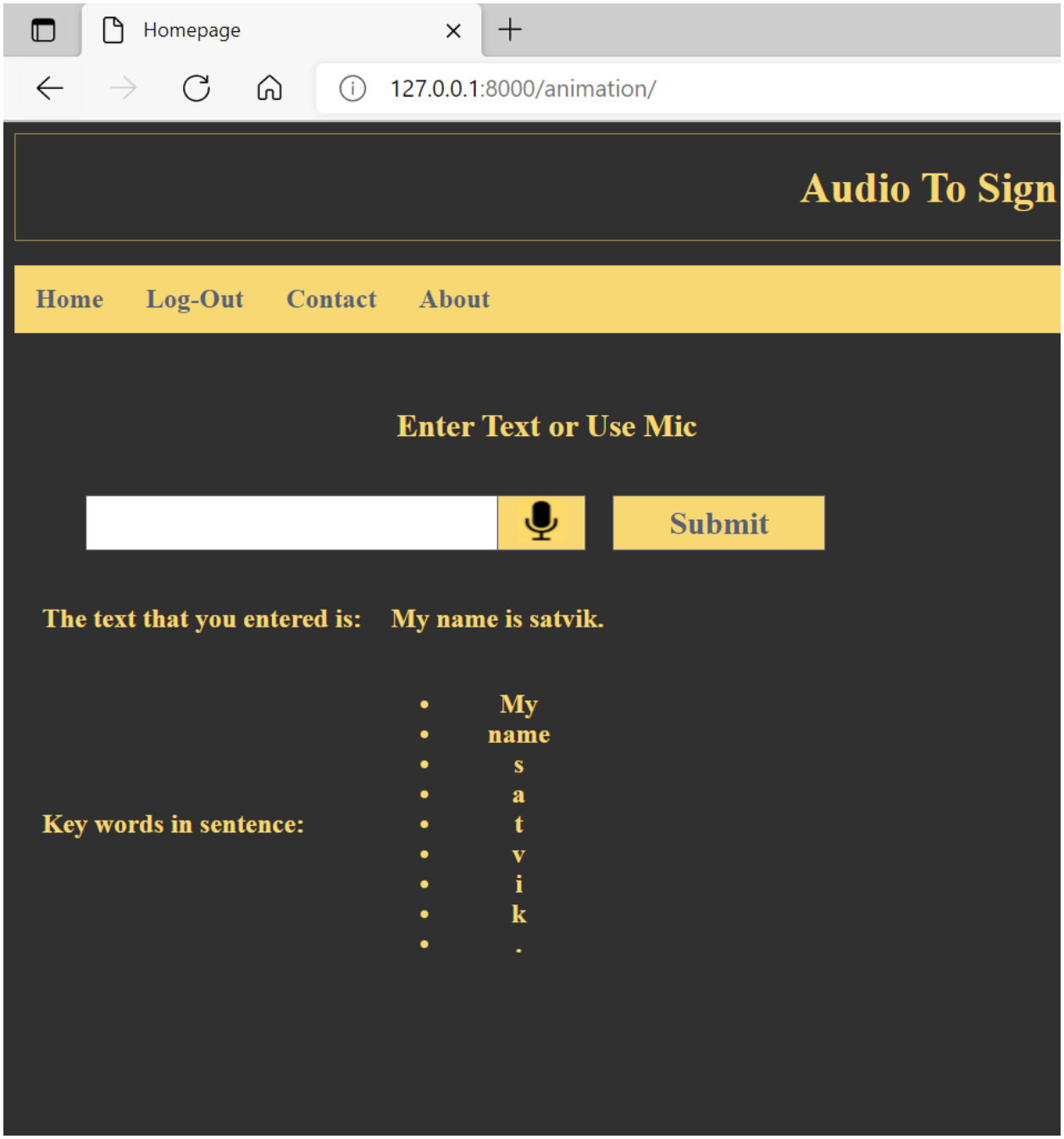
```
            'ma', 't', 'having', 'mightn', 've', "isn't",
"won't"])

        # removing stopwords and applying lemmatizing nlp process
to words
        lr = WordNetLemmatizer()
        filtered_text = []
        for w, p in zip(words, tagged):
            if w not in stop_words:
                if p[1] == 'VBG' or p[1] == 'VBD' or p[1] ==
'VBZ' or p[1] == 'VBN' or p[1] == 'NN':
                    filtered_text.append(lr.lemmatize(w,
pos='v'))
                elif p[1] == 'JJ' or p[1] == 'JJR' or p[1] ==
'JJS' or p[1] == 'RBR' or p[1] == 'RBS':
                    filtered_text.append(lr.lemmatize(w,
pos='a'))

                else:
                    filtered_text.append(lr.lemmatize(w))

        # adding the specific word to specify tense
        words = filtered_text
        temp = []
        for w in words:
            if w == 'I':
                temp.append('Me')
            else:
                temp.append(w)
        words = temp
        probable_tense = max(tense, key=tense.get)
```

```
        if probable_tense == "past" and tense["past"] >= 1:
            temp = ["Before"]
            temp = temp + words
            words = temp
        elif probable_tense == "future" and tense["future"] >= 1:
            if "Will" not in words:
                temp = ["Will"]
                temp = temp + words
                words = temp
            else:
                pass
        elif probable_tense == "present":
            if tense["present_continuous"] >= 1:
                temp = ["Now"]
                temp = temp + words
                words = temp

        filtered_text = []
        for w in words:
            path = w + ".mp4"
            f = finders.find(path)
            # splitting the word if its animation is not present
in database
            if not f:
                for c in w:
                    filtered_text.append(c)
            # otherwise animation of word
            else:
                filtered_text.append(w)
        words = filtered_text
```

```
        return render(request, 'animation.html', {'words': words,
'text': text})
    else:
        return render(request, 'animation.html')


def signup_view(request):
    if request.method == 'POST':
        form = UserCreationForm(request.POST)
        if form.is_valid():
            user = form.save()
            login(request, user)
            # log the user in
            return redirect('animation')
    else:
        form = UserCreationForm()
    return render(request, 'signup.html', {'form': form})


def login_view(request):
    if request.method == 'POST':
        form = AuthenticationForm(data=request.POST)
        if form.is_valid():
            # log in user
            user = form.get_user()
            login(request, user)
            if 'next' in request.POST:
                return redirect(request.POST.get('next'))
            else:
                return redirect('animation')
    else:
        form = AuthenticationForm()
```

```
    return render(request, 'login.html', {'form': form})


def logout_view(request):
    logout(request)
    return redirect("home")
```




Homepage
127.0.0.1:8000/animation/
Audio To Sign
Home
Log-Out
Contact
About
Enter Text or Use Mic
Submit
The text that you entered is: My name is satvik.
Key words in sentence:
My
name
s
a
t
v
i
k
.

Homepage

127.0.0.1:8000/animation/

Audio To Sign Language Tool

Home Log-Out Contact About

Enter Text or Use Mic

Submit

The text that you entered is: My name is satvik.

Key words in sentence:

- My
- name
- S
- a
- t
- v
- i
- k
- .

Sign Language Animation

Play/Pause