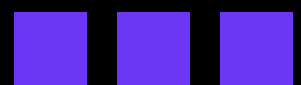




Presented by Group-PCSE25-65

# FINAL YEAR PROJECT



# TRANSLATING SIGN LANGUAGE TO SPEECH



## Project Guide

Dr. Parita Jain

## Team Leader

Srishti Upadhyay

## Team Member

Tanya Sharma

## Team member

Vikas Kumar

# Objectives

**1** To create a model for Gesture Recognition

**2** To obtain Translation Accuracy

**3** To create User-Friendly Interface

**4** To assess Real-Time Performance



**This project tends to help specially abled people at workplace, social spaces, etc.**

Date: 1 March

# Database


## ASL-LEX 2.0

Search For A Word

See Tutorial Download Data

Filters

mind:



Alternate English Translations:  
No alternate English translations

About the sign:

<https://asl-lex.org/visualization/?sign=cup>

# Timeline

**JUNE '23**

- Study of research paper
- Finding databases
- Exploring NLP and Open-CV

**JULY '23**

Learning required technology

**AUGUST'23**

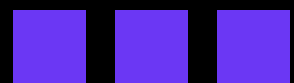
Learning required technology

**SEPTEMBER' 23**

Working on the project

**OCTOBER' 23**

Building the model



# Timeline

**NOVEMBER'**  
**23**

Training the  
Model

**DECEMBER'**  
**23**

Working on  
the research  
paper

**JANUARY'**  
**24**

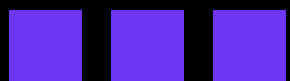
Working on  
the research  
paper

**FEBURARY '**  
**24**

Completion of  
project

**MARCH'24**

Adding extra  
features



# Timeline

**APRIL'24**

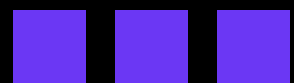
Enhancing  
Accuracy

**MAY'24**

Reviewing  
research  
paper

**JUNE'24**

Publishing  
research  
paper





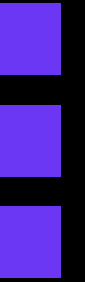
# LITERATURE REVIEW



Sr. No.	Journals	Year	Techniques	Findings	Shortcomings
1.	A Novel Natural Language Processing (NLP)–Based Machine Translation Model for English to Pakistan Sign Language Translation	2020	NLP	<ul style="list-style-type: none"> <li>Quantitative results reveal a very promising Bilingual Evaluation Understudy (BLEU) score of 0.78.</li> <li>Comparative analysis shows that our proposed system works well for simple sentences.</li> </ul>	System works well for simple sentences but struggles to translate compound and compound complex sentences correctly.
2.	<u>EasyTalk</u> : A translator for Sri Lankan sign language using machine learning and artificial intelligence	2020	<ul style="list-style-type: none"> <li>RCNN</li> <li>CNN</li> <li>NLP</li> <li>ML</li> </ul>	<ul style="list-style-type: none"> <li>The model detects at an accuracy rate of 91% for all given test scenarios.</li> <li>The model was also tested against live video and still was able to identify the gestures.</li> </ul>	For the moment, the system is proposed to be a web application and soon will be made into a mobile application with faster responses and lower processing time. Further, with the introduction of 5G, the response times will be faster
3.	<u>ATLASLang</u> NMT: Arabic text language into Arabic sign language neural machine translation	2021	<ul style="list-style-type: none"> <li>Artificial Neural Network</li> <li>Neural Machine Translation (NMT)</li> </ul>	<ul style="list-style-type: none"> <li>The average BLEU score of <u>ATLASLang</u> MTS is 0,37. <u>ATLASLang</u> NMT gave an average score of 0,79, which is much closer to the ideal score.</li> </ul>	<ul style="list-style-type: none"> <li>The training could be more efficient if the dataset is were expanded.</li> <li>The system uses a limited sign database</li> </ul>
4.	<u>Utalk</u> : Sri Lankan sign language converter mobile app using image processing and machine learning	2020	<ul style="list-style-type: none"> <li>CV</li> <li>ML</li> </ul>	<ul style="list-style-type: none"> <li><u>Utalk</u> can perform well in both static and dynamic sign classification.</li> <li><u>Utalk</u> achieves high precision and recall values (over 0.90) for all the static signs.</li> </ul>	Limited dataset.

S.No	Journals	Year	Techniques	Findings	Shortcomings
5.	Recognition of Amharic sign language with Amharic alphabet signs using ANN and SVM	2021	ANN SVM	<ul style="list-style-type: none"> <li>This paper presents a system that translates Amharic sign language into text using digital image processing and machine learning algorithms.</li> <li>The system can recognize the Amharic alphabet signs with an average accuracy of 80.82% and 98.06%, respectively.</li> <li>The system has four main stages: image preprocessing, segmentation, feature extraction and classification.</li> </ul>	<ul style="list-style-type: none"> <li>This work could not work with words, phrases or sentences for the study of sign languages.</li> <li>This project could not develop a system which will work like a two-way communicator to translate sign to text and vice versa.</li> </ul>
6.	2-way Arabic Sign Language Translator using CNNLSTM Architecture and NLP	2020	<ul style="list-style-type: none"> <li>s Natural Language Processing (NLP)</li> <li>Deep Learning Neural Network (DLNN)</li> <li>Convolutional Neural Network (CNN)</li> <li>Long <u>Short Term</u> Memory (LSTM)</li> </ul>	<ul style="list-style-type: none"> <li>The CNNLSTM architecture used for sign to text translation is especially ideal for this task as it works with an RGB input from a regular smartphone camera.</li> <li>The translator endow the deaf with a choice between the 'Deaf Culture' and 'Normal' culture [21]. Communication via the mobile device would allow the deaf to explore and interact with more places and people, thus allowing them to have more social experiences.</li> </ul>	<p>work is limited to translating solo dynamic words and phrases,</p> <p>The model can be connected to a cloud database which holds a crowdsourced gesture library, would ensure that the model is robust to the sociolinguistic changes affecting sign language</p> <p>the model is a desktop application with still images as output, which limits its utility in real-time scenarios</p>
7.	Translating Speech to Indian Sign Language Using Natural Language Processing	2022	<ul style="list-style-type: none"> <li>NLP</li> </ul>	<ul style="list-style-type: none"> <li>The system accepts audio and text as input and matches it with the videos present in the database created by the authors.</li> <li>If matched, it shows corresponding sign movements based on the grammar rules of Indian Sign Language as output;</li> <li>if not, it then goes through the processes of tokenization and lemmatization</li> </ul>	<ul style="list-style-type: none"> <li>The training could be more efficient if the dataset is were expanded.</li> <li>The system uses a limited sign database</li> <li>The features of the system could be enhanced by integrating reverse functionality</li> </ul>
8.	Sign Language Recognition Using Gesture Recognition and Natural Language Processing	2021	<ul style="list-style-type: none"> <li>Literature Survey</li> </ul>	<ul style="list-style-type: none"> <li>The paper has tried to understand and analyze the approaches of various kinds and the developments which have taken place to make appropriate gesture recognition of the signer. The peculiarities in trying to create a robust system and NLP techniques have also been looked up to generate complete sentences.</li> </ul>	After capturing the video of SL sentences, the video will be broken down into images and individual words will be recognized. A system will be developed for detecting ISL and converting the detected words into a grammatically correct common language sentence

# Gaps Identified



System works well for simple sentences but struggles to translate compound and compound complex sentences correctly



The features of the system could be enhanced by integrating reverse functionality

**THANK YOU**