

# Final Year Project



Presented by Group-PCSE25-65

# Use of Open CV and NLP for translating sign language to verbal language and vice versa

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# OBJECTIVE

- **To create a model for Gesture Recognition**
- **To obtain Translation Accuracy**
- **To create User-Friendly Interface**
- **To assess Real-Time Performance**



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

# TIMELINE

## Semester 4:

- Study of different research paper
- Finding out databases
- Exploring NLP
- Exploring Open-CV

# TIMELINE

## Semester 5:

- Creating databases
- Learning about open-CV
- Learning about NLP
- Executing the project
- Writing Research paper

# TIMELINE

## Semester 6:

- Completion of project
- Adding more features
- Working on more accuracy
- Publishing Research paper



# DATABASE

ASL-LEX 2.0


Search For A Word

Type a word here

See Tutorial Download Data

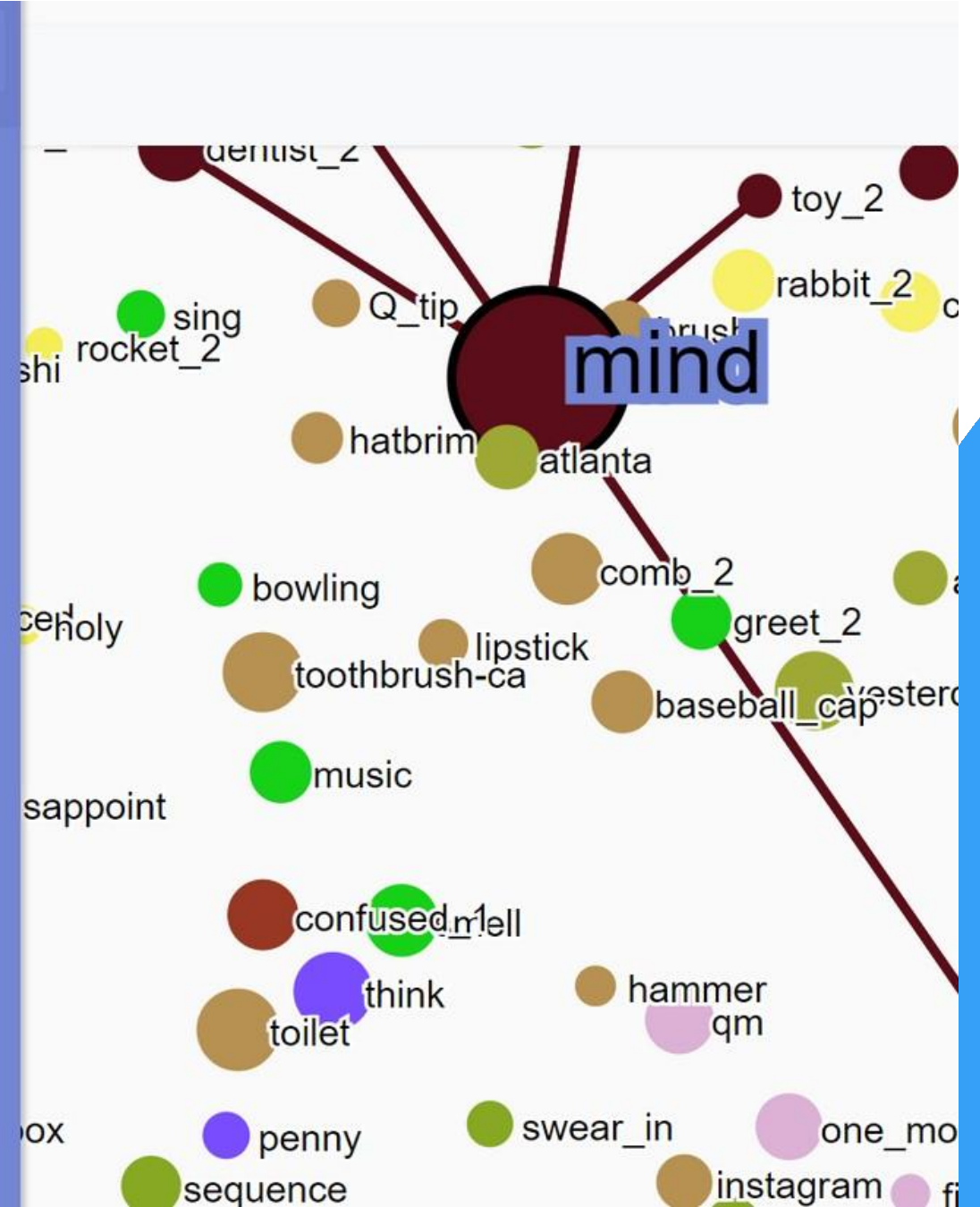
Filters

mind:



Alternate English Translations:  
No alternate English translations

About the sign:



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

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.	EasyTalk: 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.	ATLASLang 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 ATLASLang MTS is 0,37. ATLASLang 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.	Utalk: 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>Utalk can perform well in both static and dynamic sign classification.</li> <li>Utalk achieves high precision and recall values (over 0.90) for all the static signs.</li> </ul>	Limited dataset.



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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 Short Term 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</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



**THANK YOU**