

# **SIGN LANGUAGE DETECTION SYSTEM**

S.E. mini-project report submitted in partial  
fulfilment of the requirements of the degree of

## **Information Technology**

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## **CERTIFICATE**

This is to certify that the T.E. mini-project entitled “**SIGN LANGUAGE DETECTION SYSTEM**” is a bonafide work of “**Shubham Dhumal** ” (Roll no.22) [seit-1], “**Aman yadav**” (Roll no.66) [seit2], and “**Kartik vora**” (Roll no.65) [seti2] ,**Shamitha naik**(Roll no.42)[seit2] submitted to University of Mumbai in partial fulfilment of the requirement for the award of the degree of “**Information Technology**” during the academic year 2021–2022.

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## **S.E. Mini-Project Report Approval**

This mini-project synopsis entitled “*sign language detection system*” by *shubham dhumal, aman yadav, kartik vora and shamitha naik* is approved for the degree of *Information Technology* from *University of Mumbai*.

### **Examiners**

1.

2.

Date:

Place:

## Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will cause disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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## **Abstract**

*Speech impaired people use hand signs and gestures to communicate. Normal people face difficulty in understanding their language. Hence there is a need of a system which recognizes the different signs, gestures and conveys the information to the normal people. It bridges the gap between physically challenged people and normal people. Sign language is one of the oldest and most natural form of language for communication, but since most people do not know sign language and interpreters are very difficult to come by we have come up with a real time method using neural networks for fingerspelling based American sign language.*

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**List of Abbreviations**

<b>ACE</b>	Atharva College of Engineering
<b>D&amp;M</b>	Deaf and dumb


*Important Note: Hide the table border before printing. Also, abbreviations need to be added in alphabetical order.*

## **Chapter 1:**

### **INTRODUCTION**

- Communication is the process of exchange of thoughts and messages in various ways such as speech, signals, behaviour and visuals.
- Deaf and dumb(D&M) people make use of their hands to express different gestures to express their ideas with other people.
- Gestures are the nonverbally exchanged messages and these gestures are understood with vision.
- This nonverbal communication of deaf and dumb people is called sign language.
- American sign language is a predominant sign language Since the only disability D&M people have is communication related and

they cannot use spoken languages hence the only way for them to communicate is through sign language.

### **MOTIVATION/OBJECTIVE :**

- For interaction between normal people and D&M people a language barrier is created as sign language structure which is different from normal text.
- So they depend on vision based communication for interaction. If there is a common interface that converts the sign language to text the gestures can be easily understood by the other people.
- So research has been made for a vision based interface system where D&M people can enjoy communication without really knowing each other's language.
- The aim is to develop a user friendly human computer interfaces (HCI) where the computer understands the human sign language.

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### **PROBLEM STATEMENT**

Speech impaired people use hand signs and gestures to communicate. Normal people face difficulty in understanding their language. Hence there is a need of a system which recognizes the different signs, gestures and conveys the information to the normal people. It bridges the gap between physically challenged people and normal people. Sign language is one of the oldest and most natural form of language for communication, but since most people do not know sign language and interpreters are very difficult to come by we have come up with a real time method using neural networks for fingerspelling based American sign language.

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## **Chapter 2:**

**Review of literature:-**

Title	Year	Feature	Methodology	Advantage
Artificial neural network based method for Indian sign language recognition	Conference: Information & Communication Technologies (ICT), IEEE Conference	This system provides a platform for the interaction of hearing disabled people with the rest of the world without an interpreter. The proposed method uses digital image processing techniques and artificial neural network for recognizing different signs.	ANN model	The results are found to be highly consistent, reproducible, with fairly high precision and accuracy.
American Sign Language Recognition using Deep Learning and Computer Vision	2018 IEEE International Conference on Big Data	A CNN model named Inception was used to extract spatial features from frames, LSTM for longer time dependencies and RNN to extract temporal features.	CNN, LSTM and RNN	Accurate predictions of object
Deep Convolutional Neural Networks for Sign Language Recognition	2018 Conference on Signal Processing And Communication Engineering Systems (SPACES)	Selfie mode continuous sign language video is the capture method used in this work, where a hearing-impaired person can operate the SLR mobile application independently.	CNN	They achieved 92.88% recognition rate compared to other classifier models reported on the same dataset.
An American Sign Language recognition system using leap motion sensor	2014 13th International Conference on Machine Learning and Applications (ICMLA)	The system was classified using K-Nearest Neighbor and Support Vector machine to classify the 26 letters of the English alphabet in American Sign Language using the derived features from the sensory data.	leap motion sensor	The palm-sized Leap Motion sensor provides a much more portable and economical solution than Cyberglove or Microsoft kinect used in existing studies.

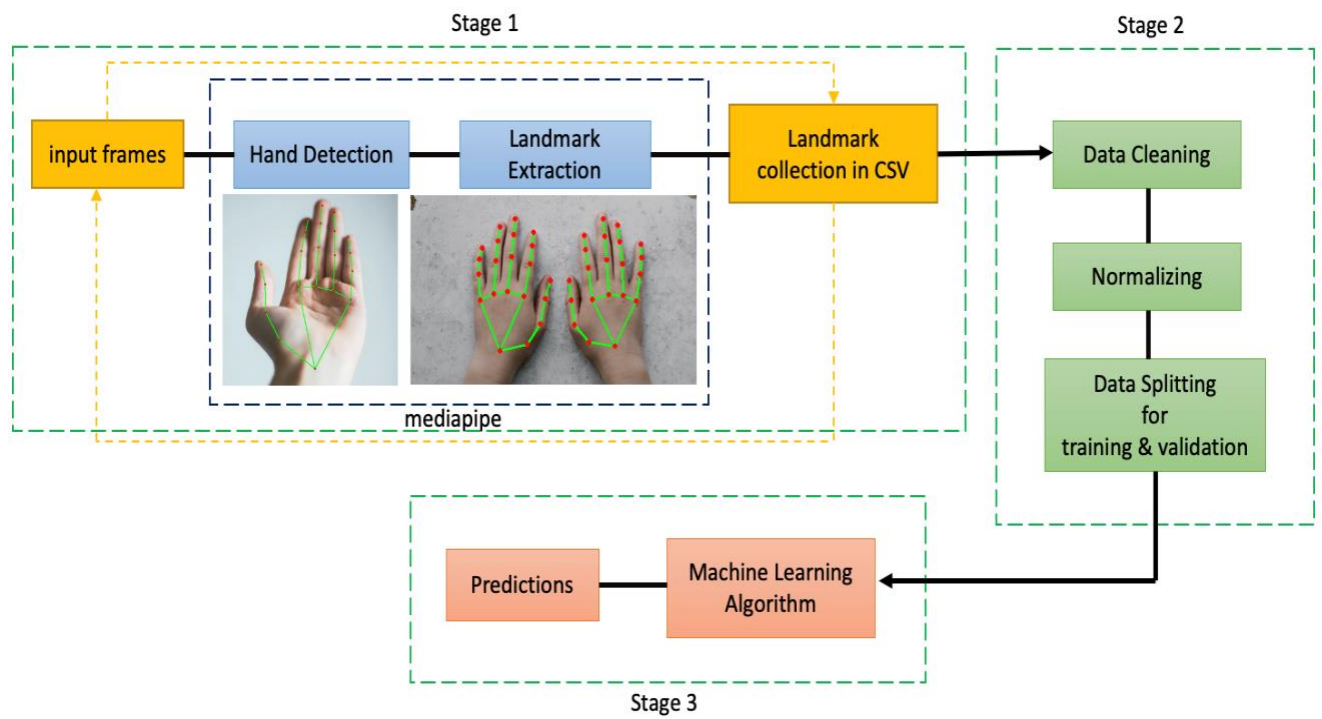
## Chapter 3:

### Proposed system:

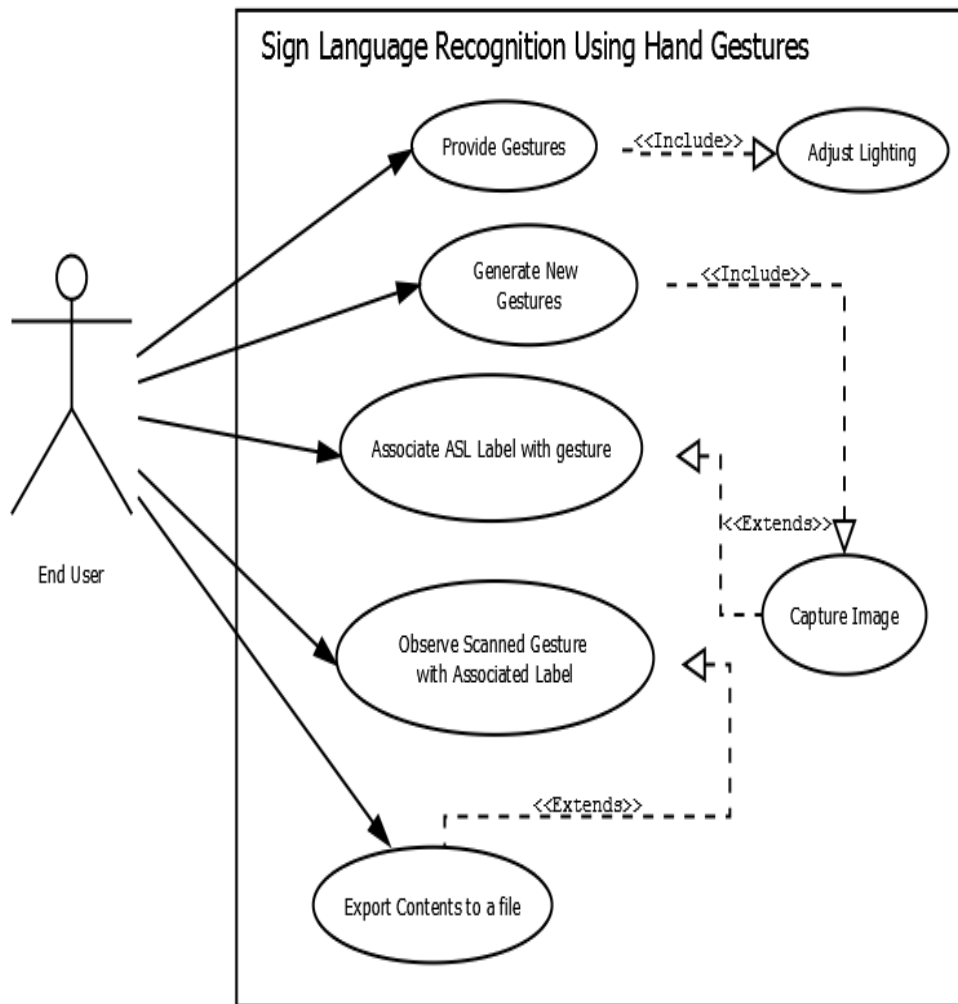
The “HAND SIGN DETECTION SYSTEM” is a proposed solution for the D&M people to help through their communication gap between them and the normal people .

- Deaf and dumb(D&M) people make use of their hands to express different gestures to express their ideas with other people.
- Gestures are the nonverbally exchanged messages and these gestures are understood with vision .
- But the people who are not aware of the sign conventions or language are not able to understand what D&M people are trying to elaborate .
- So this tool does fill the gap of understanding between them and help in better communication

## Flowchart :



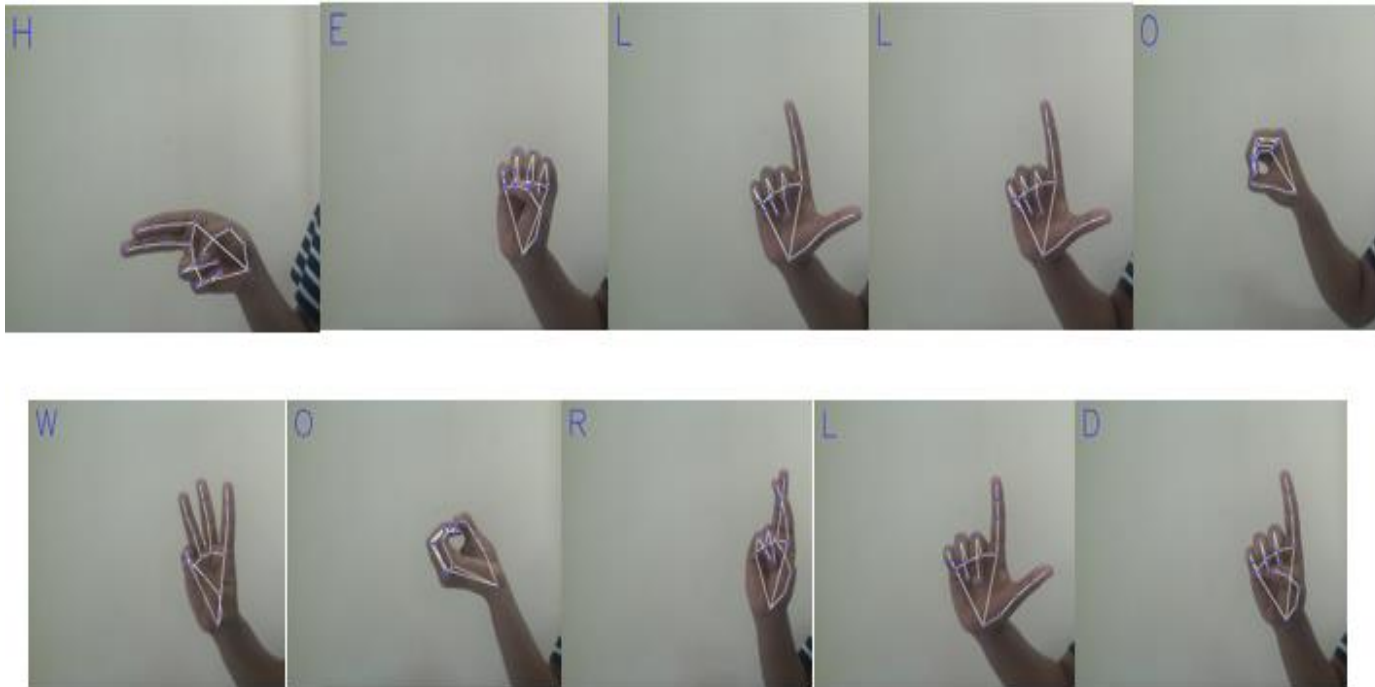
## User case diagram :





## Chapter 4:

### Results Analysis:-



## Chapter 5:

### **Conclusion:**

In this report, a functional real time vision based American sign language recognition for D&M people have been developed for asl alphabets. From this project/application we have tried to overshadow some of the major problems faced by the disabled persons in terms of talking. We found out the root cause of why they can't express more freely. The result that we got was the other side of the audience are not able to interpret what these persons are trying to say or what is the message that they want to convey. Thereby this application serves the person who wants to learn and talk in sign languages. With this application a person will quickly adapt various gestures and their meaning as per ASL standards.

## Chapter 6:

### **Future scope of the project :**

1. We are planning to achieve higher accuracy even in case of complex backgrounds by trying out various background subtraction algorithms.
2. We are also thinking of improving the pre-processing to predict gestures in low light conditions with a higher accuracy.
3. It can be integrated with various search engines and texting application such as google, WhatsApp. So that even the illiterate people could be able to chat with other persons, or query something from web just with the help of gesture.

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