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DELHI TECHNICAL CAMPUS

(Affiliated Guru Gobind Singh Indraprastha University, New Delhi)

Greater Noida

Name of the Department:

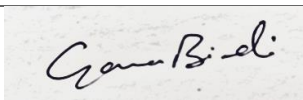

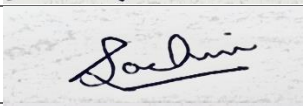
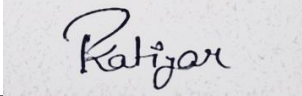
B.Tech. Computer Science Engineering

Synopsis of Project

Project Title: GESTURAMA (Gesture & Sign Language Detection Application)

Project Guide: Ms. Upasna Joshi

Project Team:

	Programme: - B.Tech. CSE	Year/Semester: - 4th Year/ 7th Semester	
S. No.	Enrolment No.	Name	Signature
1.	01918002718	Gaurav Birdi	
2.	03018002718	Md. Omer	
3.	04418002718	Sachin Sharma	
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Project Summary/Introduction:

According to World Health Organization (WHO), about 285 million people are visually impaired worldwide, 466 million people have disabling hearing loss and 1 million people are dumb. These specially aided people are discriminated and mostly suffer in various sectors of our society. One of the major shortcomings of society is the social barrier that is created between disabled or handicapped persons and persons who are blessed with all their human faculties in order. Communication, which is the basis of human progress, often tends to be an obstacle for those unfortunate people who are unable to articulate their thoughts. The root cause of this gap is that while deaf and mute persons use sign language to communicate among themselves, normal people are either reluctant to learn it or are unable to comprehend the same. Further, the former relies on lip reading to comprehend what their counterparts have said. Consequently, in a conversation between a hearing and speech impaired person and a normal person the ease of communication and hence the comfort level is hampered.

Many of these people are not even exposed to sign languages and it is observed that it gives a great relief on a psychological level, when they find out about signing to connect themselves with others by expressing their love or emotions. About 5% population in world are suffering from hearing loss. Deaf and dumb people use sign language as their primary means to express their thoughts and ideas to the people around them with different hand and body gestures. There are only about 250 certified sign language interpreters in India for a deaf population of around 7 million.

Nowadays, the evolution of technology and the increasing use of computers gave the opportunity for developing new methods of education of deaf individuals and sign language interpreters.

In this project we aspire to help these specially-abled people by developing a software which could act as a communication bridge between these two sections of the society. Our project detects the signs used in sign language and convert it into something that everyone can easily understand.

Problem Statement:

Communication among deaf-mute people and normal people is more difficult because normal people cannot perceive the speculation and feeling of deaf-mute people. So, knowing the various types of sign languages such as sign language for better communication between those people. Our project aims at solving the problems mentioned above with the help of gesture recognition.

- Deaf-mute people face these communication gap problems in their day-to-day life.
- They often suffer while communicating their feelings.
- The normal people generally are unaware/uneducated about sign language, so even if they intend on helping the specially-abled they are mostly unable to understand.

Literature survey:

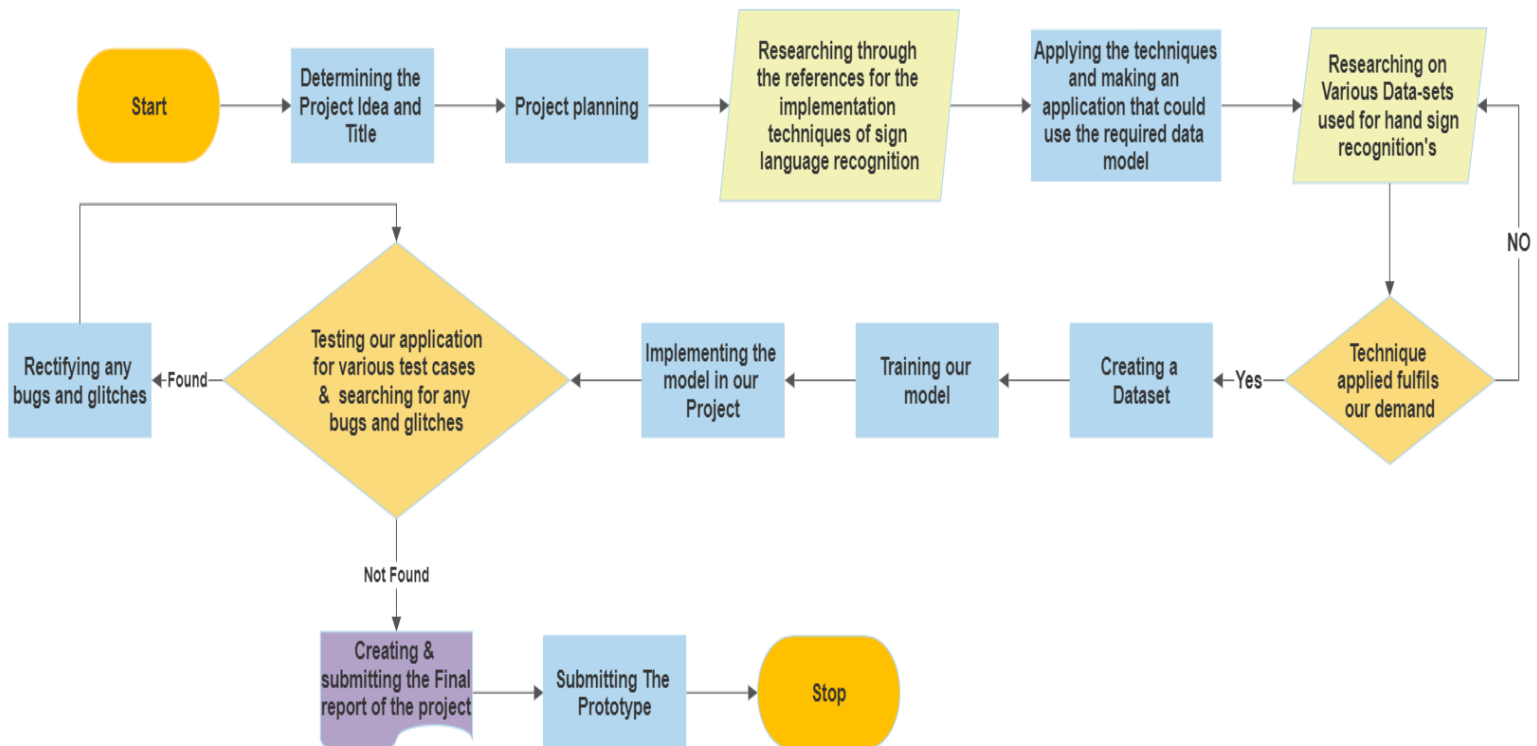
S. No.	Title	Objective	Key Points	Published By
1.	Real time hand gesture recognition system for dynamic applications	The research effort centralizes on the efforts of implementing an application that employs computer vision algorithms and gesture recognition techniques which in turn results in developing a low-cost interface device for interacting with objects in virtual environment using hand gestures.	<ul style="list-style-type: none">• Hand gesture recognition• Interacting with virtual objects• Working with virtual environment• Hand tracking	Siddharth S. Rautaray, Anupam Agrawal (IIT, Allahabad) [1]
2.	Translation of Sign Language for Deaf and Dumb People	This project's objective is to analyze and translate the sign language that is hand gestures into text and voice.	<ul style="list-style-type: none">• Sign• Language• SVM• Text• Voice	Suthagar S., K. S. Tamilselvan, P. Balakumar, B. Rajalakshmi, C. Roshini [2]
3.	Hand Gesture Recognition System for Deaf and Dumb	An in-depth literature review has been carried out to look at the present state of data relating to Hand gesture recognition systems that explicitly focused on the vision-based technique for sign language detection	<ul style="list-style-type: none">• Artificial mouth• Non-vision-based technique• Sign language detection• Speech impaired people• Vision-based technique	Syed Raquib Shareef, Mohammed Mannan Hussain [3]
4.	A Novel Technique for Speech Recognition and Visualization Based Mobile Application to Support Two-Way Communication Between Deaf-Mute and Normal People	In this work mel frequency cepstral coefficients (MFCC) based features are extracted for each training and testing sample of Deaf-mute speech.	<ul style="list-style-type: none">• MFCC• HTK• V2M application	Kanwal Yousaf, Zahid Mehmood, Tanzila Saba, Amjad Rehman, Muhammad Rashid, Muhammad Altaf, and Zhang Shuguang [4]

Objective:

Our Objective is to create a software which can easily detect the hand gestures using latest developing technology, it will eventually work towards converting that sign gestures into a much simpler form which is easier to understand.

- Our software will help the deaf-mute community that suffers because of this communication gap.
- By using our software, it will be easier for them in conveying their ideas/messages.
- As the normal people generally are unaware/uneducated about sign language, so even if they intend on helping the specially-abled they will be able to do that with the help of our software.
- The Software will be easy to use, sustainable and user friendly.

Methodology:



Resource requirement (Hardware & software etc.):

Hardware Required:

- Laptop/PC
- Processor: i5 9100F/Ryzen 5 3600H or any Processor with at least 4.00ghz
- Ram: 8GB.
- Storage: 1TB.
- OS: Windows/Linux/Mac
- Web Cam

Software Required:

- Python3.7
- Java (JDK).
- OpenCV
- TensorFlow
- XML
- Kaggle Dataset

Impact of Proposed project on the Body of Knowledge and its relevance to Academia/industry:

This project can help in various different sectors, some of the applications are:

- The dependency of specially-abled community towards others will be minimized and it will lead towards less human resourcefulness.
- The participation of that community will increase in certain sectors of society due to the ease of interpretation of their ideology.
- There will be a much stable balance between the two sectors of society.
- The community will be able to utilize every opportunity just like everyone else in the society.

Schedule of project completion:

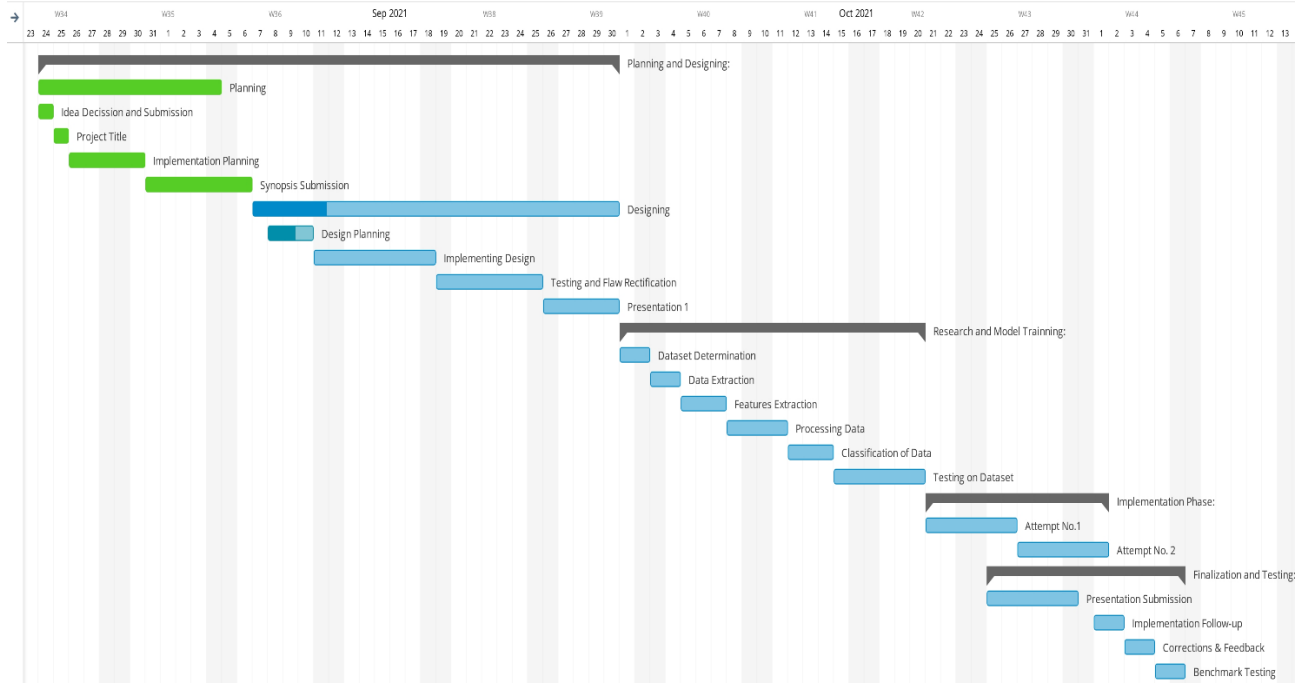
GESTURAMA

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	ACTIVITIES	START	DUE	%
	Planning and Designing:	24/Aug	30/Sep	45%
1	✓ Planning	24/Aug	04/Sep	100%
2	✓ Idea Decission and Submiss...	24/Aug	24/Aug	100%
3	✓ Project Title	25/Aug	25/Aug	100%
4	✓ Implementation Planning	26/Aug	30/Aug	100%
5	✓ Synopsis Submission	31/Aug	06/Sep	100%
6	⊗ Designing	07/Sep	30/Sep	20%
7	⊗ Design Planning	08/Sep	10/Sep	60%
8	⊗ Implementing Design	11/Sep	18/Sep	0%
9	⊗ Testing and Flaw Rectification	19/Sep	25/Sep	0%
10	⊗ Presentation 1	26/Sep	30/Sep	0%
	Research and Model Training:	01/Oct	20/Oct	0%
12	⊗ Dataset Determination	01/Oct	02/Oct	0%
13	⊗ Data Extraction	03/Oct	04/Oct	0%
14	⊗ Features Extraction	05/Oct	07/Oct	0%
15	⊗ Processing Data	08/Oct	11/Oct	0%
16	⊗ Classification of Data	12/Oct	14/Oct	0%
17	⊗ Testing on Dataset	15/Oct	20/Oct	0%
	Implementation Phase:	21/Oct	01/Nov	0%
19	⊗ Attempt No.1	21/Oct	26/Oct	0%
20	⊗ Attempt No. 2	27/Oct	01/Nov	0%
	Finalization and Testing:	25/Oct	06/Nov	0%
22	⊗ Presentation Submission	25/Oct	30/Oct	0%
23	⊗ Implementation Follow-up	01/Nov	02/Nov	0%
24	⊗ Corrections & Feedback	03/Nov	04/Nov	0%
25	⊗ Benchmark Testing	05/Nov	06/Nov	0%

GESTURAMA

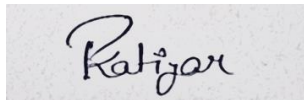
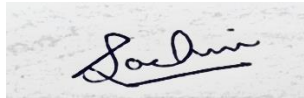
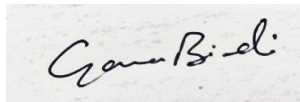
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References:

- [1] [Siddharth S. Rautaray, Anupam Agrawal \(IIT, Allahabad, 2012\): Real time hand gesture recognition system for dynamic applications](#)
- [2] [Suthagar S., K. S. Tamilselvan, P. Balakumar, B. Rajalakshmi, C. Roshini \(2020\): Translation of Sign Language for Deaf and Dumb People](#)
- [3] [Syed Raquib Shareef, Mohammed Mannan Hussain\(Muffakham Jah College of Engineering and Technology, Hyderabad, Telangana-500034, India, 2020\): Hand Gesture Recognition System for Deaf and Dumb](#)
- [4] [Kanwal Yousaf, Zahid Mehmood, Tanzila Saba, Amjad Rehman, Muhammad Rashid, Muhammad Altaf, and Zhang Shuguang\(2018\): A Novel Technique for Speech Recognition and Visualization Based Mobile Application to Support Two-Way Communication Between Deaf-Mute and Normal People](#)

Signature(s) of Project Team Member(s)



Name and Signature of Project Guide

(Ms. Upasna Joshi)