Date	19 September 2022
Team ID	PNT2022TMID08592
Project Name	Real-Time Communication System Powered by AI for Specially Abled

Literature Survey

INTRODUCTION:

The proposed idea aims to develop a system that converts the sign language into a human hearing voice in the desired language to convey a message to normal people, as well as convert speech into understandable sign language for the deaf and dumb. We are making use of a convolution neural network to create a model that is trained on different hand gestures. An app is built which uses this model. This app enables deaf and dumb people to convey their information using signs which get converted to human-understandable language and speech is given as output.

Literature survey:

Paper 1- Messaging and Video Calling Application for Specially Abled people using Hand Gesture Recognition

In the first existing survey **R. R. Chhajed, K. P. Parmar, M. D. Pandya and N. G. Jaju, "Messaging and Video Calling Application for Specially Abled people using Hand Gesture Recognition," 2021 6th International Conference for Convergence in Technology (I2CT), 2021, pp. 1-4, doi: 10.1109/I2CT51068.2021.9417924.**

'The existing paper proposes a system to overcome these barriers and allow everyone to interact with each other irrespective of their disabilities and facilitate everyone to communicate with each other through messaging and video calling irrespective of their disabilities. This paper proposes a vision-based application which can be used for the communication of such people using text and video calling. For better accuracy various object detection and image classification algorithms are implemented. The application uses Indian Sign Language as the dataset.

Paper 2 - IFSA: an integrated framework for developing IoT linked mobile

applications for specially abled people

In the second existing survey **Kaur, S., Dhindsa, K.S. IFSA: an integrated framework for developing IoT linked mobile applications for specially abled people.** *Wireless Netw* **28, 1375–1388 (2022).**

The existing paper proposed the Internet of Things has the potential to improve social interaction for visually challenged people. Hardware devices are constantly being equipped with various electronic sensors for collecting real-time data. However, specially-abled people need an integrated system to access the features of mobile applications and external hardware kits on one platform. Therefore, an integrated framework for the specially-abled is developed. IoT has the potential to improve social integration for people with visual defects. This research is an attempt to design a framework for developing a mobile application using IoT to provide secure and integrated services to the visually impaired people. The findings of the study revealed that the designed framework will help in developing various wireless embedded systems using mobile phones.

Paper 3- Sign Language Recognition System for Deaf People

In the third existing survey **Sharma, A., Pingale, S., Sabale, U., Patil, N., Dongre, S. (2023). Sign Language Recognition System for Deaf People. In: Garg, D., Kumar, N., Iqbal, R., Gupta, S. (eds) Innovations in Information and Communication Technologies. Algorithms for Intelligent Systems. Springer, Singapore.**

A sign language recognition system is a way to communicate with deaf–mute people. A large number of deaf and mute people are present across the world, and sometimes, it becomes difficult for normal people to communicate with them since not everyone can understand sign language. To establish effective communication between normal and specially abled people, there is a need to encourage the use of a sign language recognition system. In this language, people communicate through various hand gestures with each other. The purpose of language is to bridge the gap between the deaf–mute communities and the speaking folks. This research proposes an optimal recognition system whose major objective is to accomplish the translations of static sign language alphabets, numbers and words of American Sign Language into human and machine understandable English language. In the proposed model, in the first phase, the preprocessing functionality of input gestures takes place. In the next phase, various region properties of preprocessed gestures will be computed by the system. In the final phase, based on the properties

calculated before, the translation of sign to text is to be carried out and the same works in the opposite manner as well for speech to sign conversion.

Paper 4- A Robust Business Specific Real-Time Sign Language Translator

In the fourth existing survey **Waiz KhanStudent, Department of Computer Engineering, Khaja Bandanawaz College of Engineering, Kalaburagi, Karnataka, India**

Communication is a great way of expressing yourself but not everyone is capable of communication. No, not everyone chooses to be silent, While some are born deaf and mute, others become one later in life due to certain conditions. The word "dumb" is quite offensive so I will address to someone who cannot speak as mute person throughout this paper. Returning to the topic this paper will enable a more effective way to fill the communication gap between deaf and mute person and normal person especially in places with crowd where special-abled person becomes nervous and anxious to make the business owner understand of his needs easily and are unable to express themselves. In order to remove this barrier and enable the effective communication between the special-abled buyer and the business owner, I have created our own data set of hand gestures and trained using Google Teachable Machine for common sentences that are exchanged between the buyer and seller.

Paper 5- A Deep Learning Framework for Real-Time Indian Sign Language Gesture Recognition and Translation to Text and Audio

In the fifth existing survey **Deshpande, A.M., Inamdar, G., Kankaria, R., Katage, S. (2023). A Deep Learning Framework for Real-Time Indian Sign Language Gesture Recognition and Translation to Text and Audio. In: Pati, B., Panigrahi, C.R., Mohapatra, P., Li, KC. (eds) Proceedings of the 6th International Conference on Advance Computing and Intelligent Engineering. Lecture Notes in Networks and Systems, vol 428. Springer, Singapore.**

Indian Sign Language (ISL) is used in the deaf community all over India. Development of the ISL recognition system is an active area to aid this community. In ISL, most of the signs are two-handed signs, and thus, it differs from another commonly used American Sign Language (ASL) and seems complex. In this paper, the design and implementation of a system to recognize ISL signs is reported. Building such a system can help specially abled person/people, by providing a medium to communicate with

others without human interpreters. The proposed system is built using a deep convolutional neural network (CNN), which performs both feature extraction and classification, preceded by an image preprocessing step. A real-time input (live signs captured from webcam) is given to this system, and the output is delivered in the form of text and audio

Paper 6- Sign Language Recognition Using Convolutional Neural Network

In the fifth existing survey **Rakesh, S., Bharadhwaj, A., Sree Harsha, E. (2021). Sign Language Recognition Using Convolutional Neural Network. In: Raj, J.S., Iliyasu, A.M., Bestak, R., Baig, Z.A. (eds) Innovative Data Communication Technologies and Application. Lecture Notes on Data Engineering and Communications Technologies, vol 59. Springer, Singapore.**

In today's world, communication is very important. A language is needed to communicate. Most of the specially abled people, use a different language for communication called sign language. This language helps them to communicate with other people with their hand expressions. These expressions will be different from country to country. In this paper, American sign language is used. This paper deals with helping specially abled people to communicate with people who don't know sign language by using the approaches of computer vision and deep learning. Our paper uses convolutional neural network to solve this problem. The first part of our paper focuses on capturing different hand expressions in the form of video by the person and translating them to text using a convolutional neural network. The other part focuses on the reverse of it, showing GIF upon converting text. Integrating these two parts will help in two-way communication.