Real-Time Communication System Powered by AI for Specially Abled

Literature Survey

Abstract- People with impairments are a part of our society. Although technology is constantly evolving, little is being done to improve the lives of these people. The ability to communicate with a deaf-mute person has always been difficult. It is quite challenging for silent persons to communicate with non-mute people because hand sign language is not taught to the general public. It might be quite challenging for them to communicate at times of crisis. In circumstances where other modes of communication, like speech, are not possible, the human hand has remained a common alternative for information transmission. To have proper communication between a normal person and a handicapped person in any language, a voice conversion system with hand gesture recognition and translation will be very helpful.

The project intends to create a system that can translate speech into specified sign language for the deaf and dumb as well as translate sign language into a human hearing voice in the desired language to communicate a message to normal people.

A convolution neural network is being used to build a model that is trained on various hand motions.On the basis of this model, an app is created. With the help of this app, persons who are deaf or dumb can communicate using signs that are translated into speech and human-understandable words.

Keywords- Deaf, mute, hand gestures, translation, convolution neural network

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We frequently observe deaf-mute individuals struggling to communicate.

They are constantly treated with contempt since others don't regard them as equals but rather as people with impairments. We commonly see deaf-mute people having trouble communicating. We also notice that they are unable to communicate because the listener doesn't understand their sign language. When there is an emergency, this becomes problematic. In order to readily identify hand movements and vice versa, we suggest creating a model using OpenCV and Convolutional Neural Network, a deep learning algorithm. We plan to create a web application using the Flask web framework that will make it easier for regular people and individuals with impairments to communicate.

A face based Real time communication for physically and speech disabled people was published by Ong Chin Ann Marlene Valerie Lu ia and Lau Bee Theng from the Swinburne University of Technology, Malaysia published at 2011 Published in the United States of America by Information Science Reference (an imprint of IGI Global). The authors of this chapter propose an enhanced interpersonal-human interaction for people with special

needs, especially those with physical and communication disabilities. The proposed model comprises automated real time behavior monitoring, designed and implemented with the ubiquitous and affordable concept in mind to suit the underprivileged. In this chapter, the authors present the prototype which encapsulates an automated facial expression recognition system for monitoring the disabled, equipped with a feature to send Short Messaging System (SMS) for notification purposes. The authors adapted the Viola-Jones face detection algorithm at the face detection stage and implemented template matching techniques for the expression classification and recognition stage.

In a paper proposed by Pallavi Verma(Electrical and Electronics Department, Amity University, they have described a gesture based device for deaf and dumb person for communication.. Generally dumb people use sign language for communication, but they find difficulty in communicating with others who don't understand sign language. So, there is a barrier in communication between these two communities. Their work aims to lower this barrier in communication. The main aim of the proposed project is to develop a cost-effective system which can give voice to voiceless people with the help of Smart Gloves. With the proposed work sign language is converted into text and speech using flex sensor and microcontroller. It means that using smart gloves communication will not be a barrier between two different communities.

The aim of the system by Surbhi Rathi Department of Information Technology Yeshwantrao Chavan College of Engineering is to make a dual way communication system between deaf- dumb and normal people. The paper presents a vision-based approach where continuous sequences of frames of dynamic and gestures have been taken. Word-processing segmentation, feature extraction and classification are the main steps to recognize dynamic and gestures of ISL words. After that, dual way communication is performed. In that first the recognized gesture has been converted into text message and voice format so that a normal person can understand it. Second, voice has been converted into text message and its corresponding gesture so that physically impaired humans can understand it. Hence the proposed system can definitely break the barrier between deaf dumb and normal people.

In a paper proposed by R Rumana(B.E Graduate(IV year), Department of Computer Science and Engineering, SCSVMV, Kanchipuram), Reddygari Sandhya Rani(B.E Graduate(IV year), Department of Computer Science and Engineering, SCSVMV, Kanchipuram) , Mrs. R. Prema(Assistant Professor, Department of Computer Science and Engineering, SCSVMV, Kanchipuram), it says various sign language systems have been developed by many makers around the world but they are neither flexible nor cost-effective for the end users. Hence, it is a software which presents a system prototype that is able to automatically recognize sign language to help deaf and dumb people to

communicate more effectively with each other or normal people. Dumb people are usually deprived of normal communication with other people in the society, also normal people find it difficult to understand and communicate with them. These people have to rely on an interpreter or on some sort of visual communication. An interpreter won't always be available and visual communication is mostly difficult to understand. Sign Language is the primary means of communication in the deaf and dumb community. As a normal person is unaware of the grammar or meaning of various gestures that are part of a sign language, it is primarily limited to their families and/or deaf and dumb community.

A face based Real time communication for physically and speech disabled people was published by Ong Chin Ann ,Marlene Valerie Lu ia and Lau Bee Theng from the Swinburne University of Technology, Malaysia published at Jan 2011 Published in the United States of America by Information Science Reference (an imprint of IGI Global)

Design of Communication Interpreter for Deaf and Dumb Person was pblished by Pallavi Verma(Electrical and Electronics Department, Amity University, Greater Noida, Uttar Pradesh, India) , Shimi S. L (Assistant Professor, NITTTR, Chandigarh, India), . , Richa Priyadarshani (Electrical and Electronics Department, Amity University, Greater Noida, Uttar Pradesh, India).
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At 7th International Conference on Cloud Computing, Data Science & Engineering - Confluence (Confluence) by Surbhi Rathi Department of Information Technology Yeshwantrao Chavan College of Engineering Nagpur, India and Ujwalla Gawande Department of Information Technology Yeshwantrao Chavan College of Engineering Nagpur, India.

A Review Paper on Sign Language Recognition for The Deaf and Dumb published by R Rumana(B.E Graduate(IV year), Department of Computer Science and Engineering, SCSVMV, Kanchipuram) , Reddygari Sandhya Rani(B.E Graduate(IV year), Department of Computer Science and Engineering, SCSVMV, Kanchipuram) , Mrs. R. Prema(Assistant Professor, Department of Computer Science and Engineering, SCSVMV, Kanchipuram).
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