Real-Time Communication System Powered by AI for Specially Abled

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ABSTRACT

In our society, we have people with disabilities. The technology is developing day by day but no significant developments are undertaken for the betterment of these people. Communications between deaf-mute and a normal person has always been a challenging task. It is very difficult for mute people to convey their message to normal people. Since normal people are not trained on hand sign language. In emergency times conveying their message is very difficult. The human hand has remained a popular choice to convey information in situations where other forms like speech cannot be used.

Communication, which is essential in human life, is challenging. Humans are social beings, and effective communication is necessary. The development of technology should, therefore, serve to improve their lives as well. The deaf and dumb category must be involved within technology on PC experience as they involved in technology on smartphones. D-talk application provides this experience for them by reading their hand movements and displays a certain function.

The project 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

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.

INTRODUCTION

According to the World Health Organization, the world population experiencing hearing and speech challenges approximates over 466 million people globally. With Such disability, instead unequally distributed resources, these people are vulnerable to discrimination . The fact that every human being, abled or disabled, is entitled to a good life with equal opportunities calls for affirmative action . This society requires attention from all quarters, especially on technological enhancement, to ensure the disabled get a comfortable life. With the number increasing significantly, something needs to be done. The deaf and dumb are introverts, remaining engraved in their thoughtful world.

The project 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.

LITERATURE SURVEY

TITLE	AUTHOR AND YEAR	PUBLISHER	PROBLEM PROPOSED	PROPOSED SOLUTION	PROS AND LIMITATIONS
Two-Way Sign Language Conversion for Assisting Deaf-Mutes Using Neural Network	Rishi K; Prarthana A , Pravena K S, S. Sasikala, S.Arunkumar (2022)	IEEE	In this paper the human-machine interactive era gesture plays an important role in communication.	The proposed system uses Convolution Neural Network (CNN) for converting sign language to speech.	The usage of sign language has reduced the gap but studying and understanding sign language seems to be difficult for the common people. The CNN model gives an accuracy of 95.5%.

FineHand: Learning Hand Shapes for American Sign Language Recognition	Al Amin Hosain, Panneer Selvam Santhalingm, Parth Pathak, Huzefa Rangwala, Jana Kosecka (2020)	IEEE	In thi paper Learning Hand Shapes for American Sign Language Recognition	They will demonstrate that higher quality hand shape models can significantly improve the accuracy of final video gesture classification by using CNN, RNN	In this model to alternative approaches exploiting different modalities and representations of the data and show improved video gesture recognition accuracy on GMU-ASL51 benchmark dataset.

| Design and Development of Hand Gesture based Communication Device for Deaf and Mute People | Omkar Vaidya, Sanjay Gandhe, Abhishek sharma, Asit Bhate, Vishal Bhosale, Rushabh Mahale (2020) | IEEE | Sign Language is a natural language which deaf community uses for communication. | In this paper, 3-D accelerometer is used to detect the gesture of disable person and based on it customized database is generated which is processed through nodeMCU and Raspberry Pi and displayed the message on LCD screen | The he gestures that have been translated include numbers, alphabets and few phrases. The accuracy of this system is as high as 97.5%. |

| Research on Communication APP for Deaf and Mute People Based on Face Emotion Recognition Technology | Yuan Tao, Shihang Huo,Wenyu Zhou (2020) | IEEE | Communication APP for Deaf and Mute People Based on Face Emotion Recognition Technology. | face emotion recognition and sign language recognition tsign language video recognition technology, emotional speech synthesis technology, speech recognition technology and finally perform sign language and emotion recognition | Through experiments on 630 gesture images, the recognition rate reached 94.22% and the speed reached 0.29s/frame. |

Design and Development of Hand Gesture based Communication Device for Deaf and Mute People	Omkar Vaidya, Sanjay Gandhe, Abhishek sharma, Asit Bhate, Vishal Bhosale, Rushabh Mahale (2020)	IEEE	Hand Gesture based Communication Device for Deaf and Mute People	In this paper, 3-D accelerometer is used to detect the gesture of disable person and based on it customized database is generated which is processed through nodeMCU and Raspberry Pi and displayed the message on LCD screen	The he gestures that have been translated include numbers, alphabets and few phrases. The accuracy of this system is as high as 97.5%.

Intelligent glove for sign language communication	Nitipon Navaitthiporn, Preeyarat Rithcharung, Phitnaree Hattapath, C. Pintavirooj	IEEE	glove for sign language communication	This research created a hand glove for deaf and mute people to provide better communication between disabling and normal people..	It has accuracy about 70 - 100% which depends on another factor. From this process, we got a hand glove for sign language communication. This glove will help deaf and mute people to communicate more efficiently.

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Thank You