REAL-TIME COMMUNICATION SYSTEM POWERED BY AIFOR SPECIALLY ABLED

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ABSTRACT

Communication plays a significant role in making the world a better place. Communication creates bonding and relations among the people, whether persona, social, or political views. Most people communicate efficiently without any issues, but many cannot due to disability. They cannot hear or speak, which makes Earth a problematic place to live for them. Even simple basic tasks become difficult for them. Disability is an emotive human condition. It limits the individual to a certain level of performance. Being deaf and dumb pushes the subject to oblivion, highly introverted. In a world of inequality, this society needs empowerment. Harnessing technology to improve their welfare is necessary. In a tech era, no one should be limited due to his or her inability. The application of technology should create a platform or a world of equality despite the natural state of humans.

On the other hand, technology is the most innovative thing on Earth for every time the clock ticks, researchers, software engineers, programmers, and information technology specialists are always coming up with bright ideas to provide convenience to everyone. This paper shows how artificial intelligence is being used to help people who are unable to do what most people do in their everyday lives. Aligned with communication, D-talk is a system that allows people who are unable to talk and hear be fully understood and for them to learn their language easier and also for the people that would interact and communicate with them.

Introduction

Deaf and dumb people are humans at the deepest psychological level. 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.

Review of Literature

Machine Learning

It is essential to choose the right strategy.

Machine-learning techniques are often used to do this Machine learning is part of artificial intelligence (AI). It can be defined as an algorithm that focuses on computer program development [14, 15, 35, 43]. Machine learning considered an application that use to increase computer ability to learn from previous experiences

Deep Learning

Compared to standard algorithms, neural networks can solve somewhat complicated issues at a much easier level about the complexity of algorithms. Neural networks can solve somewhat complicated issues at a much easier level concerning the complexity of algorithms [26, 30]. The neural network builds to mimic human brain neural function but with the mathematical functions [31, 33,38].

One of the neural networks is the multi-layer network.It includes three layers, the input layer, many hidden layers, and the output layer [21,39]. The input layer passes data without modification. Hidden layers process the data, and the output layer converts hidden layers to output as a classification. Collecting datasets for training takes time to process [41, 45].

Image Recognition Process

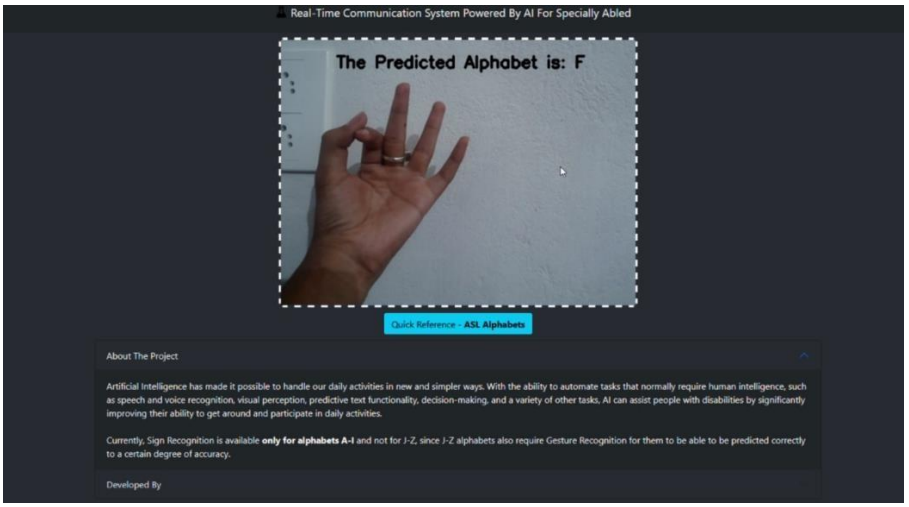
The image recognition process is a process that enables the input of the sign language into the application for necessary processing [20,31,46]. The process requires a sign to be made in front of the webcam. The computer captures the sign made via the webcam and stores the different images made. Images that come from the camera will be resized, and the resolution will change. The colors will change to grayscale image and then to black and white images while editing the images [25, 33,47]. There several techniques used to extract the image, such as SIFT, SURF, BRISK, and HSV algorithms. Scale Invariant Feature Transform "SIFT" is used to extract features vectors that define local patches of the image [35]. These features are invariant to translation, rotation, and illumination, not only vectors scale-invariant. There are several advantages to the SIFT descriptor [36]. For example, this descriptor is accurate than any other descriptor. It can describe the key points in the image for any object. It allows an individual feature to define the correct match with the best probability in a huge database of features [37]. Also, it can cover the full range scales and location of the image, and it is close to real-time performance.

Speed Up Robust Features "SURF" is used in computer vision tasks, and it used for object detection purposes. SURF is based on determinant of the Hessian Matrix (square matrix of
second ordered partial derivatives of a scalar function), and it exploits integral pictures to improve feature detection speed [19,48].

Object Detection

For this application, object detection will be involved. It is one of the classical problems of computer vision because it depends on different elements, such as the level of lighting and the position of the user. It is difficult to have an idea where the object is located and how the image is segmented. We need to know what the shapes of the fingers are, where they are located.

Real Time Examples




Real-Time Communication System Powered By AI For Specially Abled
The Predicted Alphabet is: A
Quick Reference - ASL Alphabets
About The Project
Artificial Intelligence has made it possible to handle our daily activities in new and simpler ways. With the ability to automate tasks that normally require human intelligence, such as speech and voice recognition, visual perception, predictive text functionality, decision-making, and a variety of other tasks, AI can assist people with disabilities by significantly improving their ability to get around and participate in daily activities.
Currently, Sign Recognition is available only for alphabets A-I and not for J-Z, since J-Z alphabets also require Gesture Recognition for them to be able to be predicted correctly to a certain degree of accuracy.
Developed By

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