REAL TIME COMMUNICATION SYSTEM FOR SPECIALLY ABLED USING AI

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INTRODUCTION

Communication is a social process of exchanging information from one entity to another in verbal and non-verbal form. It defines our existence and it is an important instrument that connects people together. It comes naturally as a raw skill embedded in most people at birth and we acquired the ways of communication through cognitive learning. Communication is the basis, which drives the process of development in all the fields (Manohar, 2008) and it is the very core of our civilization. The ability to communicate allows us to express emotion, feelings, convey our thoughts and ideas as well as to relate our experiences. It plays an important role in the dis-semination of information and sharing of knowledge especially in the academic arena. Research has found that humans started to learn how to communicate with each other since they are born not only through spoken and written languages but also body gesture, posture, facial expression and eye contacts. Communication skill might come as a natural ability in the majority of people. However, there are some people afflicted with some form of physical defects which affect their ability to communicate. One of the more severe disabilities is known as “cerebral palsy”, a congenital disorder at birth which causes abnormality in their motor system. It affects their muscle movement and coordination, learning and speech abilities. Their malfunctioned motor system causes an uncontrollable and involuntary movement. They are unable to control their oral-facial muscles, thus affecting their ability to perform facial expression appropriately.Many assistive tools or formally termed as Alternative and Augmentative Communication (AAC) has been developed and employed to assist people with impaired communication skills. The term encompasses the whole combination of methods used for communication such as text to speech system, pointing gestures, facial expression and body language. Although these AACs have been widely used to assist the disabled, it is not potentially effective because most AACs are text to speech and touch screen based applications, which are unsuitable for those with severe physical abilities.

PROBLEM STATEMENT

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. Communication 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 in 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. Voice Conversion System with Hand Gesture Recognition and translation will be very useful to have a proper conversation between a normal person and an impaired person in any language.

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. 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.

EXISTING SOLUTIONS

It's been over a decade since facial recognition technology has been a significant topic in the news. It made headlines in 2005 when it was used to identify the 9/11 terrorists. Ten years later, it seems that this high-tech innovation is being used less for catching criminals and more for making people feel secure.

PROPOSED SOLUTIONS

The methodology has following main steps:

1. Generation of the database.

Here our system takes the hand movements through the web camera. In this proposed method, 26 combinations of Indian characters are developed by the use of the right Hand saved in the training database.

2. Image preprocessing and segmentation.

The pre-processing takes place on these recorded input gestures. Then the segmentation Hands are performed to separate the object and the background.

3. Feature Extraction.

The segmented hand image is represented with certain features. The characteristics are used for gesture recognition with the template matching algorithm that gives Optimized results.

4. Sign recognition.

The given character gesture is recognized with the skin color recognition and the template Matching from the record.

5. Sign to text and Speech conversion. The recognized sign is then mapped into text and further converted into speech With TTS libraries.

CONCLUSION

The proposed communication system between Deaf and Dumb people and ordinary people are aiming for it when bridging the communication gap between two societies. Several work was done earlier in this area, but this paper adds in complete two - sided communication in an efficient manner because the system is implemented as one Handy mobile application. So, it really serves its needs in all aspects. The above strategies prove to be efficient In terms of time and accuracy.

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