DEVELOPMENT OF DEVICE FOR THE MUTE COMMUNITY TO CONVERT THEIR GESTURE SIGNS TO SPEECH

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Abstract - The mute community around the globe has a hard time communicating with the rest of the world's population. This communication gap is there because a dumb person uses sign language which is not comprehensible by a normal person. This project mainly focuses on removing the barrier of communication between the mute community and the people not familiar with the concept of sign language so that the messages that a dumb person is trying to relay is understandable to a person with no knowledge of sign language. The design of the device is based on embedded systems. Flex sensors and microcontroller are the key components.
Keywords—Flex Sensors, Arduino, Android Phone, Bluetooth, 2 axis accelerometer, Mobile App.

I. INTRODUCTION

Technology is developing day by day but no significant developments are under taken for the mute people. Mute people have no ability to interact with their environment. Such people depends on the sign language to access. So importance of hand gesture recognition increases. It creates the natural interaction between them and normal human. According to the statistics of the world federation of the dumb and the world health organization, approximately 70 million people in the world are the mute community. The majority of the speech and hearing, impaired people cannot read or write in regular language. Sign language is the native language use by the mute people to communicate with others. Natural input device like these attract more attention because it is powerful, more effective, and does not require extra connection, than any other devices. Hand gesture recognition is used in TV controlling, robot control, human computer interaction, education, daily information retrieval etc,. This device is developed to improve the life style of the person who has speaking disabilities. This device converts the gestures to speech i.e,gives voice to the mute person. Speech is one of the important factor required for the humans to convey their messages. In this project, flex sensors plays the major role. They are stitched to the glove. The output from the flex sensors is fed into the arduino development board. Arduino converts analog signal to digital and then data is send to android phone via Bluetooth where the speech output is obtained using an android phone. The purpose of this paper is to present a survey on different hand gesture recognition approaches with advantages, disadvantages and recognition methodology of hand gesture recognition. Although a lot of work has been done on hand gesture recognition and recognition methodology, this paper focuses on advancement of gesture recognition system. It is up to date and represents a good point for investigators in hand gesture recognition area.

II. LITERATURE SURVEY

A. Blind Separation of Doppler Human Gesture Based on Continuous-Wave Radar Sensors [1].

Zhitao Gu, Jun Wang, Fazhong Shen& Kuiwen Xu represents a set of experiments used to develop a statistical system from translating speech into sign language for deaf and dumb people. Two different approaches have been used to perform the translations. A phrase- based system and a finite state transducer. The system which is composed of an Automatic Speech Recognition (ASR) system. This paper presents translation results of reference sentences and sentences from automatic speech recognizer. In this experiment, Radar system is used. It creates a problems like high power consumption in this system. In order to overcome the problems, we can modify that power consumption is lower than their radar system.

B. A Framework for Hand Gesture Recognition & Spooting Using Substrate Modeling [2].

Dinesh mandalapuet al propose a new sub-gesture modelling approach which represents each gesture as a sequence of fixed sub-gestures(a group of consecutive frames with locally coherent context) and provides a robust modelling of the visual features. We further extend this approach to the task of gesture spotting where the gesture boundaries are identified using a filler model and gesture completion model. Experimental results show that the proposed method outperforms state-of-the-art Hidden Conditional Random Fields (HCRF) based methods and baseline gesture spotting techniques.

C. Hand Gesture Recognition Using Deep Learning[3].

Static and eight dynamic hand gestures. The three main steps are hand shape recognition, tracing of detected hand (if dynamic), and converting the data into the required command. Experiments show 93.09% accuracy HyunChal