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USE OF AN ANDROID OPERATING SYSTEM TO ENABLE SPEECH FOR THE DEAF AND DUMB

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ABSTRACT

Smart gloves have been developed to assist people with physical disabilities in communicating with others. These gloves can be used to convert hand gestures into text or pre-recorded audio, enabling individuals who are unable to speak to communicate effectively. In addition, the gloves can be used to control home appliances, giving people with disabilities greater independence. The main goal of the technology is to reduce obstacles for individuals with disabilities by providing them with a reliable, easy-to-use, and lightweight communication tool.

Keywords—ArduinoMega2560, voice record/playback, methodology, isd1820voice recording module.

I. INTRODUCTION

Sign language is a visual communication method used by deaf and mute individuals that utilize a combination of hand shapes, orientations, and movements, as well as facial expressions, to convey meaning. Gestures are used to communicate words and sentences, and sign language often has signs for whole words, as well as signs for letters to form words without corresponding signs.

In this paper, a Sign Language Glove is proposed as a tool to assist individuals with speech impairments in communicating through gestures. The user will make alphabet gestures with a single hand, which will be recorded by the glove's flex sensors and accelerometer sensors. The ATmega328 microcontroller will control all processes and translate the gestures into visual and audio formats. The flex sensors will detect the amount of bend on the sensor and change in resistance, which will be used to track finger and palm movements. This technology has the potential to greatly improve communication for those with speech impairments.

II. LITERATURE SURVEY

The following research papers have been evaluated for finalizing the objectives of our project work. The research papers discussed in this collection are mostly relevant to our project USE OF AN ANDROID OPERATING SYSTEM TO ENABLE SPEECH FOR THE DEAF AND DUMB.

In this project describes the working principle of a system which is useful for deaf and dumb people to communicate with the normal people. The system has contact switch sensor for detecting the finger motions. The sensor values are stored on the board. Based on the hand motions the stored outputs are displayed on the LCD and same as play through the speaker[1].

The sensor less sign language and gesture recognition system is a module which provides an easy and satisfactory user communication for deaf and dumb people. The module provides two way communications which helps in easy interaction between the normal people and disables. The system is novel approach to ease the difficulty in communicating with those having speech and vocal disabilities. The aim is to provide an application to the society to establish the ease of communication between the deaf and mute people by making use of image processing algorithm. Since it follows an image-based approach it can be launched as an application in any minimal system and hence has near zero-cost[2].

This paper carries us slightly closer to building sign language recognition system that performs well under natural. The proposed method combines effectively the color, texture, boundary and prior shape information to produce an effective video segmentation and tracking of sign language videos under various harsh environments such as cluttered backgrounds, poor lighting, fast moving objects and occlusions. The color and texture information is extracted statistically by creating a feature vector and classifying each pixel in the frame to object and background pixel. Boundary information is provided by divergence operator along with the curvature of the object under consideration. Including shape information from the previous frame it is done a whole lot of difference to the level set minimization to segment correctly and track effectively the occulted hand from the other hand and also head sometimes. We have effectively demonstrated by experimentation of the proposed method by applying to it [3].

Signal verbalization is one of the useful ways to ease the communication between the deaf and mute and normal society. Though signing may be enforced to speak, the target person should have a thought of the signing that isn't attainable forever. Thus it reduces such barriers. This paper was meant to be a typical example to visualize the feasibleness of recognizing sign languages. With this, deaf or mute communities will use the gloves to make gestures in keeping with signing and also the gestures are going to be converted to speech[4].

The more reliable, user-independent, and portable system to convert the sign language to text message form which consumes less power because of the low ultra-power AT89S52 microcontroller designed. This text message can be translated to voice using a simple mobile app. It helps to overcome the limited communication between dumb/deaf people with the rest of the world[5].

III. PROPOSED METHODOLOGY

In the proposed system, a flex sensor is utilized to convert sign language into both voice and text displayed on an LCD screen. The system is designed with gesture-based circuitry to cater to the needs of speechless patients and individuals with physical challenges. The pre-determined gestures are stored in a microcontroller, which processes the generated gestures and announces them as voice output.

The system is built using an Arduino board, which is an open-source hardware and software company that contains an onboard power supply, a USB port for communication with a computer, and an Atmel328 microcontroller chip. The flex sensor is attached to a glove to detect sign language input and communicate it to the microcontroller. The system includes a power adaptor input and a 6 UNNI USD serial communication port for program dumping. The gesture patterns are displayed on a 16x2 LCD screen, and corresponding pre-recorded voices are announced through an APR33A3 voice board, with voice playback through a regular electromagnet speaker.

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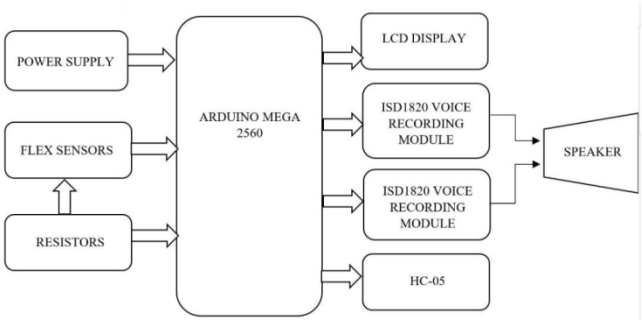
This system has the potential to greatly improve communication for individuals who are unable to communicate effectively through speech, providing a way for them to convey their thoughts and needs through sign language.

BLOCK DIAGRAM



OBSERVATION AND RESULTS

The emergence of smart gloves is a remarkable technological advancement aimed at assisting individuals with physical disabilities in overcoming communication barriers. By converting hand gestures into audio or text, these gloves provide a reliable and user-friendly communication device for people who cannot speak. Additionally, the technology enables individuals with disabilities to control home appliances, granting them greater independence and improving their quality of life.

Overall, smart gloves have the potential to make a significant difference in the lives of people with disabilities. They offer a means for individuals to express themselves more effectively and interact with others in a more meaningful way. Furthermore, by providing control over home appliances, they can help people with disabilities become more self-sufficient, enhancing their overall quality of life. The development of this technology represents a promising solution to the communication and independence challenges faced by people with disabilities.

IV.CONCLUSION

The aim of this project is to provide a means for individuals with physical disabilities to communicate their needs and express themselves through gestures. To achieve this, a new technique has been proposed involving the use of a sensor glove equipped with five flex sensors, a microcontroller, and an accelerometer. The results of the project show that this design, which includes a tactile sensor, is effective in reducing ambiguity between gestures and improving accuracy. The sensor gloves were designed using affordable and accessible technology, incorporating low-cost flex sensors and compatible with commonly available Android phones.

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