Speaking System for Dumb People Using Hand Gesture

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Abstract: *The ability to communicate is essential for individuals to express themselves and engage in social interactions. However, people with speech disabilities face challenges in verbal communication. This research paper presents a speaking system designed to address the communication needs of dumb individuals using the Arduino Uno platform. The system utilizes hand gestures captured by flex sensors and processed by Arduino Uno to generate speech output through speech synthesis techniques. The abstract provides an overview of the speaking system, its objectives, and the significance of the research. It highlights the hardware setup, firmware development, gesture recognition, speech synthesis, and integration with a home automation system. The abstract concludes by emphasizing the feasibility and effectiveness of the system in facilitating communication for dumb individuals, contributing to inclusive and interactive communication.*
Key Word: *speaking system, dumb people, Arduino Uno, gesture recognition, speech synthesis, flex sensors, communication, home automation.*

I.INTRODUCTION

Effective communication is a fundamental aspect of human interaction, enabling individuals to express their thoughts, emotions, and needs. however, individuals with speech disabilities, such as dumb people, face significant challenges in verbal communication, which can limit their ability to fully participate in social interactions. to address this issue, this research paper presents a speaking system specifically designed for dumb people using the arduino uno platform.

The arduino uno, a widely available and accessible microcontroller board, provides a versatile and cost-effective solution for implementing various applications. by leveraging the capabilities of arduino uno, we aim to develop a speaking system that empowers dumb individuals to communicate effectively using hand gestures.

The speaking system relies on gesture recognition as the primary input modality. hand gestures are captured using flex sensors, which detect the bending of fingers and convert them into electrical signals. these signals are processed by the arduino uno microcontroller, which analyzes and interprets the gesture data. through intelligent algorithms and mapping techniques, the system translates recognized gestures into meaningful commands or actions.

In addition to gesture recognition, the speaking system incorporates speech synthesis techniques to enable vocalization of the user's intentions. the recognized gestures are processed and transformed into synthesized speech output, providing a means for dumb individuals to express themselves verbally and convey their thoughts and needs to others.

II.LITERATURE SURVEY

A natural way to convey a certain idea or intent is through gesturing. In this study, a wearable hand glove-based sign language interpreting system is proposed. The American Sign Language alphabet is distinguished by this wearable technology using five flex-sensors, two pressure sensors, and a three-axis inertial motion sensor. Three components make up the entire system: a wearable device with a sensor module, a processing module, and a mobile application module with a display unit. Android-based smartphones were designed with a text-to-voice feature that transforms the incoming text into auditory output.

Multiple orientation sensors were used to obtain Euler angles, which were then used to create a gesture detection system. The IS-300 Pro Precision Motion Tracker from Inter Sense was employed in a real-time arm gesture recognition system for the identification. This strategy is excellent and quite accurate. The sensor can attain accurate angles, and the system can correctly recognise and anticipate a wide range of movements. This approach was used and validated by Automatic Gesture Recognition for Intelligent Human-Robot Interaction, which creates a system that can recognise faces and gestures automatically. All the potential gestures were collected in a sizable database. At each stage of gesture identification, they applied a variety of techniques for effective and natural operation, including learning and extracting information from articulated joints and depicting gestures.

III. MODULE DESCRIPTION

1 Data glove
2 Flex Sensor
3 Atmega328P

4 6df mini player
5 Audio Amplifier
6 Speaker
7 16X2 Lcd display
8 I2c Module

## IV. FLOW CHART
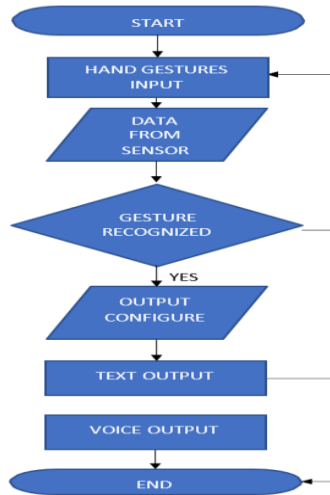
V. HARDWARE RESULT ANALYSIS

An Arduino Uno-based speaking system for the voiceless can assist those who are silent in communicating with others. A range of sensors are used by the system to identify hand motions, which are subsequently converted into text or voice. This makes it possible for mute persons to express their needs and desires to others in a clear and simple manner.

Arduino Uno can be used in a variety of ways to build speaking systems for silent people. A flex sensor is a popular method for detecting hand motions. The user wears a piece of material on their hand that has the flex sensor connected to it. The flex sensor flexes in response to a specific hand gesture from the user, changing its resistance.
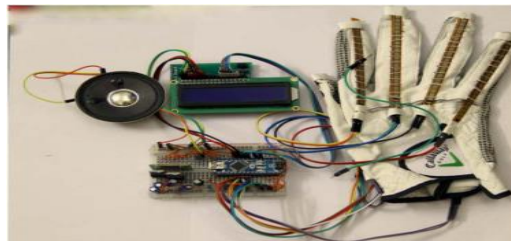
Hand Gesture	Command on LCD Display
	Call The Doctor
	Hi !How Are You
	I Am OK

VI. CONCLUSION

In conclusion, a gadget that enables people who are mute to communicate with others is a speaking system for mute persons that uses an Arduino Uno. A range of sensors are used by the system to identify hand motions, which are subsequently converted into text or voice. This makes it possible for mute persons to express their needs and desires to others in a clear and simple manner.

Arduino Uno can be used in a variety of ways to build speaking systems for silent people. A flex sensor is a popular method for detecting hand motions. The user wears a piece of material on their hand that has the flex sensor connected to it. The flex sensor bends in response to a certain hand gesture made by the user, which changes

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