

Enabling Alternative Strategies for Populace with Speech Impairment

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ABSTRACT -For those who are deaf or mute, sign language is their primary form of communication. If a normal person wants to communicate with a silent or speech-impaired individual, they must either learn sign language or hire an interpreter. This mobile application is a complex system created to improve communication between the communities of the deaf and hard of hearing as well as between them and the general populace. There are modules in this smartphone application that teach sign language to users. A different approach to communication based on gestures is presented: a gesture vocalizer powered by Arduino and sensors. Application entails teaching people various wordand sentence-level methods. They might increase their confidence by attempting the test once the training period is over. Nevertheless, once their confidence is constructed, kids will be able to use the app to begin learning other languages. Last but not least, if they are unable to manage speaking, they can choose an alternative approach by utilising the glove. The signs are converted to text, image, and audio output once the glove has been enabled with a gesture movement. Making visual aids for the provided text is a part of the last stage.

I. INTRODUCTION

Every human being needs communication as their primary means of thought and opinion expression. Therefore, it became extremely difficult for the illiterate and those with speech disability to communicate their ideas. Our plan is to create a smartphone application that uses various gesture tutorials to instruct and train persons with speech impairments. In this application, we offer a single solution to three issues. We concentrate on providing the people with instructional training, boosting their self-confidence by having them take Date of Acceptance: 22-04-2023

various tests, and helping them to learn new languages. In addition to this, we also provide them the choice of utilising a smart glove, which enables the person on the other end to correctly understand what they are attempting to say. Its modules is listed as follows :

- ➢ Training phase
- Testing Confidence
- Learning New Language
- Smart Glove based gesture
- Generating Visual boards

II. BACKGROUND STUDY

M.S.Kasar, AnvitaDeshmukh, Akshada Gavande Priyanka Ghadage, (2016) For persons who have trouble speaking, software has been created that enables them to converse with others more effortlessly. In addition to this, we also provide them the choice of utilising a smart glove, which enables the person on the other end to correctly understand what they are attempting to say.

Sudarshana Chakma, Sushith Rai S, Sushmita Pal, Uzma Sulthana K, H S Kala (2019) We employed the fuzzy logic algorithm in this paper. To build fuzzy logic systems for various purposes, this library offers a set of tools and functions. It can be applied to a variety of tasks, such as decisionmaking, pattern identification, and control systems.

Aastha Nagpal, K. Singha, Rakshita Gouri, Aqusa Noor, A. Bagwari (2020) We utilised an Arduino Mega 2560 for this paper. It is a board for a microcontroller that uses the ATmega2560 (datasheet). It contains 16 analogue inputs, 4 hardware serial ports (UARTs), a 16 MHz crystal oscillator, 54 digital input/output pins (14 of which can be utilised as PWM outputs), a USB connector, a power jack, an ICSP header, and a reset



button. It comes with everything needed to support the microcontroller; to get started, just plug in a USB cable, an AC-to-DC adapter, or a battery. The majority of shields made for the Arduino Duemilanove or Diecimila are compatible with the Mega.

D. Bajpai, U. Porov, G. Srivastav and N. Sachan, (2015) Mutual authentication and a "new cypher algorithm" are used by the SD Card security system to guard against unauthorised access to the card's contents. There is also a non-secured access to the user's own stuff. This is built on a sophisticated, low voltage-operating nine-pin interface (Clock, Command, 4xData, and 3xPowerlines).

III. MODULE DESCRIPTION Arduino UNO



An easier way to incorporate electronics into cross-disciplinary projects is with Arduino, a single-board microcontroller. The hardware comprises of a straightforward open-source hardware board built on an Atmel 32-bit ARM or 8bit AVR microprocessor. The software consists of a boot loader that runs on the microcontroller and a compiler for a common programming language.





BREADBOARD : A breadboard is used to create circuits and connect differentsensors and actuatorsto the Arduino board.





Product Description

For the MPU-6000TM and MPU-6050TM MotionTrackingTM devices, also known as the MPUTM. product MPU-60X0TM or this specification offers detailed information on the electrical specification and design-related information. Electrical properties are solely dependent on the outcomes of design analysis and simulation. Without prior warning, specifications can change. Based on the prod's description, the final specifications will be adjusted.

MPU-60X0:

A 3-axis gyroscope, 3-axis accelerometer, and a Digital Motion ProcessorTM (DMP) are all included in the world's first integrated 6-axis MotionTracking device, the MPU-60X0, which is only 4x4x0.9mm in size. It directly accepts inputs from an external 3-axis compass via its own I2C sensor bus, resulting in a full 9-axis MotionFusionTM output. With its 6-axis integration, on-board MotionFusionTM, and run-time calibration firmware. the **MPU-60X0** MotionTracking device enables manufacturers to do away with the expensive and labor-intensive selection, qualification, and system level integration of discrete devices, guaranteeing consumers the best motion performance.

FLEX SENSOR :



LCD DISPLAY :

Materials used in liquid crystal displays (LCDs) contain characteristics of both liquids and crystals. Instead of a melting point, these materials have a temperature range where the molecules are practically as mobile as they would be in a liquid yet are arranged in a crystal-like arrangement.

POWER SUPPLY:

The power supply needs to be +5V with a transient tolerance of no more than 10mv. The voltage (VL) at pin 3 needs to be properly adjusted to produce a better/suitable contrast for the display. A live circuit must not have a module introduced or removed. So that no voltage is induced in the power supply's ground connection, it needs to be adequately separated. To prevent generated stray voltages that could result in a flickering display, the module needs to be isolated from the other circuits.

HARDWARE:

Create a distinct decoded 'E' strobe pulse with a high active level to go along with each module transaction. The RS and R/W inputs can be driven by address or control lines. If the extended time mode is offered by the Host, use it when interacting with the module. Implement instructions that extend the Read and Write strobes or other suitable data strobes to meet the interface timing requirements. Setting the "E" bit simultaneously with the RS and R/W bits would violate the module's set up time if a parallel port were being used to drive the RS, R/W, and "E" control lines. To meet the requirements for correct interface timing, a



different instruction should be utilised.

IV.METHODOLOGY PROPOSED SYSTEM

Every person requires communication as a foundation to express how they feel and what they want, as well as their ideas and views. But, speaking their thoughts is challenging for those with speech difficulty. Thus, we suggest a Smart Education application with a hand glove to train them and give them the self-esteem and confidence they need to overcome this problem and freely speak with other people. With the use of various gestures, this programme teaches persons with disabilities to communicate freely.



V.RESULTS AND DISCUSSION





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VI. CONCLUSION

- When we think of dumb individuals, we think of those who are unable to convey their emotions through speech. They communicate through sign languages. Our idea is to use latest technology to translate those sign languages and provide audio output in the mobile device and the smart education application along with hand glove will train the people and helps them to communicate easily.
- If they are illiterates, they will be unable to comprehend the text. As a result, pictures would aid people in comprehending information clearly. This is also an e-learning platform for mute people.

REFERENCES

- M.S.Kasar, AnvitaDeshmukh, Akshada Gavande Priyanka Ghadage, "Smart Speaking Glove-Virtual tongue for Deaf and Dumb", IJAREEIE, Vol. 5, Issue 3, pp. 1588-1594, 2016
- [2]. Sudarshana Chakma, Sushith Rai S, Sushmita Pal, Uzma Sulthana K, H S Kala, "Development of Device for Gesture To Speech Conversion For The Mute Community", International Conference on Design Innovations for 3Cs Compute Communicate Control, pp.97-99, 2018
- [3]. Aastha Nagpal, K. Singha, Rakshita Gouri, Aqusa Noor, A. Bagwari Computer Science 2020 12th International Conference on Computational Intelligence and Communication Networks (CICN)2020
- [4]. D. Bajpai, U. Porov, G. Srivastav and N. Sachan, "Two Way Wireless Data Communication and American Sign Language Translator Glove for Images Text and Speech Display on Mobile Phone," Fifth International Conference on communication Systems and Network Technologies (CSNT), Gwalior, 2015, pp. 578-585.
- [5]. Ajit Manware, Rajnish raj, Amit kumar, Tejaswini pawar, "Smart gloves as a communication tool for the speech impaired and hearing impaired", Journal emerging technologies and innovative research., vol. 8, pp. 78-82, October 2021.
- [6]. P. Mohan, M. Mohan Raj, M. Kathirvel, P. A. Kasthurirangan, S. Musharaff, T. Nirmal Kumar, "Smart speaking glove for deaf and dumb", International Journal of

Engineering Research & Technology (IJERT)., vol. 8, pp. 1-3, April 2020.

- [7]. Poornima N., Abhijna Yaji M. Achuth, Anisha Maria Dsilva, and Chethana S. R. Review on text and speech conversion techniques based on hand gesture. In 2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS), pp. 1682-1689. IEEE, 2021
- [8]. Priiyadharshini M., Balaji V. R., Thrisha R., and Suruthi R. Sign speaks-an IoT based smart gloves for dumb. In 2021 6th International Conference on Communication and Electronics Systems (ICCES), pp. 470-475. IEEE, 2021.
- [9]. Banerjee, Namrata, Apurba Kumar Ghosh, and Darothi Sarkar. Helper Gloves for differently abled patients using Arduino. In Proceedings of International Conference on Computational Intelligence, Data Science and Cloud Computing: IEM-ICDC 2020, vol. 62, p. 335. Springer Nature, 2021.
- [10]. Niranjana R., Ebby Darney P., Lakshmi Narayanan K., Santhana Krishnan R., Vegi Fernando A., and Harold Robinson Y. Prolific sensor glove based communication device for the disabled. In 2021 5th International Conference on Trends in Electronics and Informatics (ICOEI), pp. 6640. IEEE, 2021.