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Review Paper on Two Way Communication System with Binary Code Medium for People with Multiple Disabilities

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Abstract - *Communication is the driving force of mankind. In this modern era, Science and technology have made the human world so easy but still some physically and visually challenged people suffer from communication with others. It may be by birth or caused by any kind of accident. After losing communication, these people cannot do the normal functions or normal life. Majorly they cannot communicate with others. Various languages specifying sign language, Braille scripts, Morse codes were proposed by researchers to provide a specific communication medium. Even after such inventions, there is a clear visible gap between the communication of the normal person and a specially challenged person and communication between two specifically challenged people.*

Key Words: blind, deaf, dumb, issues, text, speech, vibrator

1. INTRODUCTION

According to ministry of statistics and program implementation 2.68 crore of the current Indian population is specially challenged, of which 44% consist of people who suffer from neither hearing speech or visual impairment. We're going to propose a new system prototype in this project called communication among blind, deaf, and dumb persons. This will aid those with disabilities in overcoming their communication barriers with both those without disabilities and those who have disabilities.

Blind individuals will use the speakers to communicate, while the deaf and dumb will be able to see through it and respond by tapping the sensor. All of these have been developed as applications so that people with impairments can use them with comfort. A model has been developed which is focused on multi model approach can be able to convert speech to visual contexts and vibrations and similarly the contexts and vibrations can be converted to speech.

1.1 Binary Code

I. Binary code represents text, computer processor instructions or any other data using a two-symbol system. The two-symbol system used is often "0" and "1" representing "off" or "on" respectively from binary number system.

II. In today's digital world, binary code is one of the most important number systems.

III. Our goal for this project is to teach disabled people about binary number system and how it applies to the technologies. In this we convert 26 letters of English alphabet to 5-bit binary code.

2. LITERATURE REVIEW

[1] A two-way communication system with Morse code medium for people with multiple disabilities:

In this research, a wearable system with a wide network of Morse code recognition and transmission is proposed. It can be used to establish short- and long-distance communication between a person with a disability and a healthy person, as well as communication within themselves. Four user-selectable operating modes, 1. Morse to Speech (MTS), 2. Speech to Morse (STM), 3. Distance Morse to Text (DMTT) 4. Distance Text to Morse are used by the system (DTTM). Depending on the application, the user can access each mode by making particular gestures. Based on the machine learning model, the gesture is identified. The four proposed user-selectable modes and the sensor-infused wearable system, which are the paper's key contributions, are meant to address the majority of communication issues faced by people with disabilities. The final section of the article details how each proposed mode operates and how the user can access them.

[2] A Contactless Morse Code Text Input System Using Ambient Wi-Fi Signal:

Patients with motor neuron disease (MND) have trouble moving their hands or arms, and even their speech function is significantly compromised, making it difficult for them to communicate with other people and these IoT gadgets. Wi Morse is a single-finger text entry method for MND patients that uses the Morse code. Wi Morse can identify finger input of letters, numbers, phrases, and sentences accurately without affixing any sensor to the finger by merging Morse code with contactless Wi-Fi

sensing. First, we suggest using the ratio of the CSI between two antennas at the same Wi-Fi receiver to capture the very slight signal change caused by a finger gesture. This efficiently removes signal noise because the two antennas on the same hardware share very comparable hardware noise. Second, in order to address the location dependency problem, we investigate the underlying cause and provide a signal transformation mechanism that rotates the original signal space by automatically choosing the best transformation vector in accordance with the initial input position. Wi Morse can be strong to input, position, environment changes, and user diversity as a result.

In order to improve the SNR, which can detect delicate finger movements that are normally impossible when using a single antenna, we suggest employing the ratio of the CSI between two antennas on the same Wi-Fi card. We empirically investigate, validate, and use the CSI ratio's characteristics to inform the Morse code sensor design. The findings of the extensive experiments indicate that the transformation process that has been suggested can greatly improve recognition accuracy from 48% to above 95%. The average text input speed can equal other Morse code-based input systems at 2.94 words per minute (WPM).

[3] A Chat Application for Communicating with Hearing Impaired Persons:

A chat application for those who have hearing impairments in this paper, an assistive technology framework is presented that offers a chat application as a communication interface for hearing impaired and non-hearing-impaired people utilizing mobile phones. It converts regular people's voicemails into text messages. The framework combines a variety of specifically created chat acronyms out of the texts. Last but not least, it connects the combination to a series of tactile feedback for the deaf person. The feedback is sent using Morse code. According to empirical data, our paradigm for communicating with hearing-impaired people is both a practical and acceptable strategy. We provide an assistive technology framework that makes use of an Android conversation app to handle the identified issues. When the OP calls the HIP, it transforms their voice communications into texts and haptic feedback. The HIP can respond to text messages using texts and synthesized speech after seeing the texts or feeling tactile input. This gives the HIP a genuine phone call experience. In order to offer the tactile feedback, we use Morse code. MC shorthand acronyms are a set of specially created shorthand chat abbreviations that are used to decode standard English text communications into a more concise format. These are the goals this work strives to achieve. We seek to create the AT framework, educate HIPs on how to use it, and assess the framework by gathering user input. Our innovative approach's ultimate objective is to enable a dependable, quick, and synchronous mobile phone communication framework for HIPs. This study employs an evaluation methodology that collects user feedback by asking a small sample of people to examine the usability of the AT framework.

[4] Finger Braille: Tactile Communication for Differently Abled:

Modern life would not be the same without mobile devices. Many of us require the ability to call or send a message from any location at any time. Compared to the rest of us, visually challenged folks find it challenging to use these applications. Braille was first developed in 1824 to provide blind people with access to information when there was none. The system receives input in the Braille language. Louise Braille created Braille, a language for the blind that made it easier for them to read text (1809-1852). Braille is a system that allows for the tactile perception of information. Six raised dots make up the Braille in its current design. This paper's goal is to provide an illustration of a wearable device made with force-sensitive sensors. Six dots are used in the creation of the Braille text. It simulates the six-finger virtual keyboard needed for Braille typing. We shall type in this document using the three fingers on our hands, which are our index, middle, and ring fingers. In this study, the android device is receiving input through the Braille language medium. Braille is a form of communication for the blind, therefore typing the message would be quite simple for them.

The text will be read out and displayed on the screen when each word is typed when input is sent through Bluetooth to the Android device. The user will then be allowed to modify the message that they have written.

[5] Braille Character Recognition Based on Neural Networks:

The most widely used system for tactile communication between visually impaired and sighted persons is Braille. The two primary steps of optical Braille character recognition (OBCR) are the recognition of the Braille cells and Braille cells transcription into the appropriate natural language letters. They can feel raised dots on the tips of their fingers on a Braille page because it indicates the binary tactile code system used by blind and visually impaired people instead of traditional printed reading and writing methods. Each Braille cell, which is made up of six raised dots arranged in three rows and two columns, represents a letter of the alphabet. In this report, an artificial neural network (ANN) technique for optical Braille character recognition was explored. Braille is the most widely used method of communication between Artificial Neural Networks, a computer approach created to simulate how the human brain performs various jobs.

The OBCR system can translate Braille characters into their equivalents in natural English, bridging the gap between blind, visually challenged, and sighted persons. Anyone who works with blind individuals who doesn't know the Braille scripting language can benefit from it. The project's main drawback is that neural networks, which are made up of numerous interconnected processing nodes and are designed after the brain. Each node computes using its weight parameters and backpropagates them to make adjustments. Due to its numerous parameters, ANN also requires more extensive training datasets. These factors make ANN computationally intensive.

3. PROPOSED WORK

In this project we are proposed a system for multi disability people like blind deaf and dumb people.

Blind module: As a replacement for the braille system that was once used to communicate with the blind, we now employ the Voice Controller System. In this, blind persons can communicate with others by speaking through the voice controller.

Deaf module: Using a vibrator to receive messages and a keyboard to type messages to others, we can connect with deaf persons using this module. It is shown on the systems of other people.

Dumb module: With the help of this dumb module, users can send the messages by text and can receive the messages through voice and in textual form.

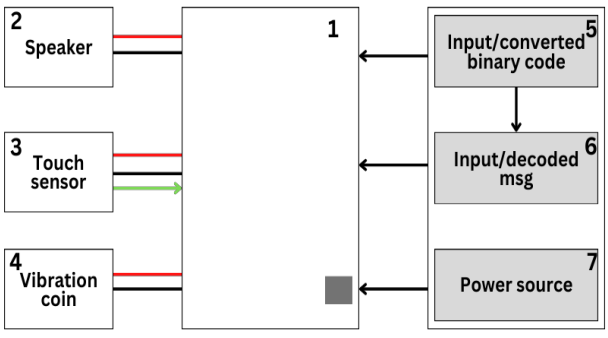

Fig:1 -Block Diagram of Proposed System

3. CONCLUSIONS

A person's future ability to independently traverse their surroundings and connect with others socially can usually be predicted by the development of hearing, decent vision, and the ability to communicate. People with multiple disabilities are at a higher risk for poor health outcomes. In this we considered the disabilities like hearing, dumbness and blindness of the people. The Blind people cannot see and cannot navigate around places, mainly the communication between people who are blind and communication with everyone is difficult. Communication of a deaf people is also difficult. Being a deaf limits the ability to receive and process the information. Dumb people communicate with others using their body language merely; especially their hand gestures. This communication mode is said to be complex. This paper aims to minimize the communication gap between the deaf, dumb and blind community and the normal world and help them to lead a preferred life. The device is used to convert text to voice for blind and he can send message through voice or tap, tap to text conversion for deaf and he can send message through text, tap to text for dumb people and he can send message through either text or tap. The main operation of this device is convert message from tap to text and text to vibration for multiple disabilities person. A simple model for blind, deaf and dumb people into a single compact device. The benefit of this device is it can be easily carried because of its less weight and size. This device is a language independent system can be used as smart assistant for specially abled people to communicate with others.

4. REFERENCES

[1] [1] "A two-way communication system with Morse code medium for people with multiple disabilities," 2020 IEEE 7th Uttar Pradesh Section International Conference on Electrical, Electronics and Computer Engineering, by Bopanna Jaswant Kranti, Kantheti Bharath Varma, Gangireddy Suhas, and G. Pradeep Reddy. DOI: 10.1109/UPCON50219.2020.9376479

[2]] K. Niu et al., "WiMorse: A Contactless Morse Code Text Input System Using Ambient WiFi Signals" IEEE Internet Things J., vol. 6, no. 6, pp. 9993–10008, 2019, doi: 10.1109/JIOT.2019.2934904.

[3] A.Amarasinghe and V.B.Wijesuriya, "Stimme:A Chat Application for Communicating with Hearing Impaired Persons" 2019 IEEE 14th Int. Conf. Ind. Inf. Syst. Eng. Innov. Ind. 4.0, ICIIS 2019 - Proc., pp. 458–463, 2019, doi: 10.1109/ICIIS47346.2019.9063252.

[4] A. K. Tripathy, M. D'sa, R. Alva, J. Fernandes, and A. L. Joseph, "Finger Braille: Tactile communication for differently abled" Proc. - Int. Conf. Technol. Sustain. Dev. ICTSD 2015, pp. 5–9, 2015, doi: 10.1109/ICTSD.2015.7095893.

[5] K.Smelyakov, A.Chupryna, D.Yeremenko, A.Sakhon, and V.Polezhai, "Braille Character Recognition Based on NeuralNetworks" Proc. 2018 IEEE 2nd Int. Conf. Data Stream Min. Process. DSMP 2018, pp. 509–513, 2018, doi: 10.1109/DSMP.2018.8478615.