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Enhancing Inclusive Communication Through Sign Language to Speech Transformation

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ABSTRACT: The project “Enhancing Inclusive Communication through Sign Language to Speech Transformation”, the sign language is a nonverbal form of communication method which is found among all deaf and dumb communities in world. Normal people do not learn the sign language. It causes barrier in communication between deaf dumb and normal people. Therefore system is being proposed with the use of accelerometer and voice play technology. System includes two modules. First module is a hand glove with sensors and microcontroller to convert hand gestures to auditory speech. Second module is Mobile based gesture data send via bluetooth to the mobile phone.

KEYWORDS: Sign language to speech transformation , accelerometer , hand gestures to auditory speech.

I. INTRODUCTION

The communication barrier between deaf and hearing individuals presents a significant challenge, limiting opportunities for the deaf population compared to blind individuals who can communicate more easily with sighted people. This communication gap greatly impacts the social and professional interactions of deaf individuals, making it a fundamental issue in their lives. Proposed system is completely portable and focuses on two way communication. System is being proposed with the use of sensors and android technology. The primary objectives of the system are to facilitate communication between mute individuals and those who can speak by converting hand gestures into audible speech, as well as to enable communication between deaf individuals and those who can hear by converting spoken language into readable text.

II. RELATED WORKS

The proposed system aims to address the communication barriers faced by mute individuals by converting their hand gestures into auditory speech, while also facilitating communication for deaf individuals by converting speech into readable text. The system utilizes sensors and Android technology to achieve these goals in a completely portable manner. Related works in this field may include research on sign language recognition systems, gesture recognition technologies, speech-to-text conversion algorithms, and assistive communication devices for individuals with disabilities. Additionally, studies on the social and psychological impacts of communication barriers and the effectiveness of assistive technologies in enhancing communication and inclusion may also be relevant.

III. EXISTING METHOD

The Image processing-based speech conversion method. The video processing-based speech conversion method. Embedded system-based push button key systems which converts the data signal to recorded voices.

IV. PROPOSED SYSTEM

The proposed wearable device which called as smart glove, it convert the hand gesture data to speech signal. The hand glove contains the three sensors accelerometer, key and sound sensor. It converts the gesture into motion data to microcontroller. The Bluetooth attached microcontroller, the mobile application collects the data's from the hand glove and converts the data to speech signals.

V. BLOCK DIAGRAM

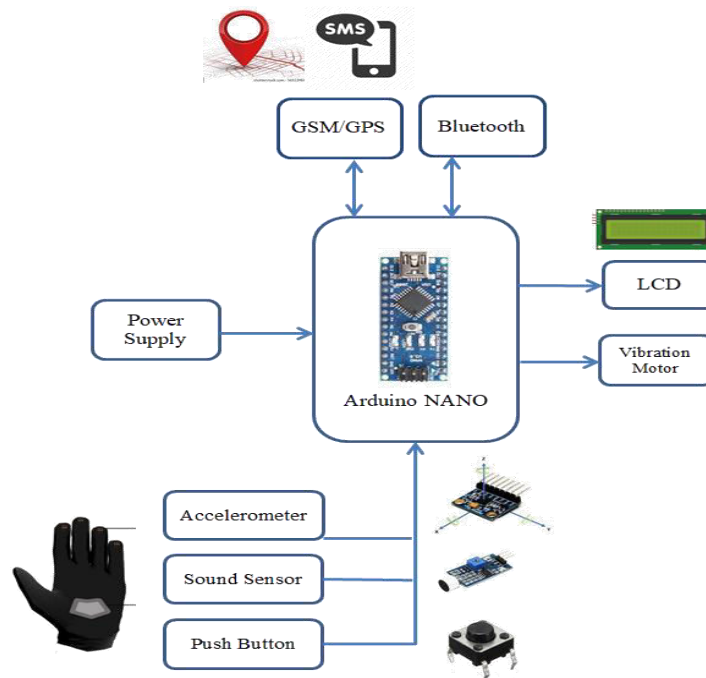


Fig 1. Block diagram for proposed method

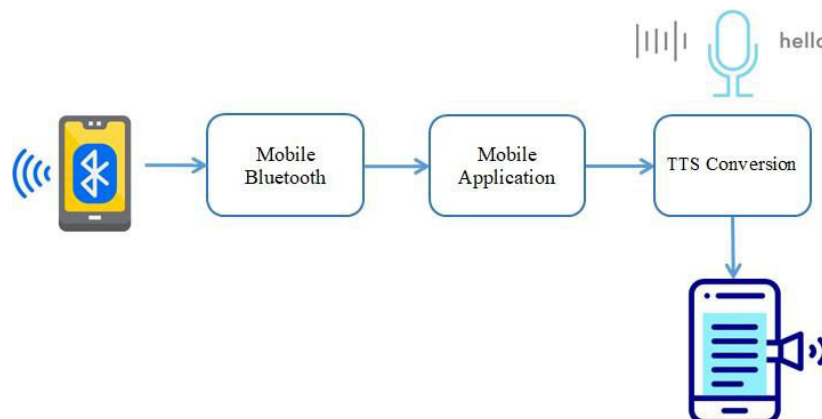


Fig 2. Software block diagram for proposed method

VI. EXPERIMENTAL RESULTS

The expected result of enhancing inclusive communication through sign language to speech transformation is the development of a reliable and accurate system that seamlessly translates sign language gestures into spoken language in real-time. This system should effectively bridge the communication gap between sign language users and non-sign language speakers, facilitating smooth and inclusive interactions in various settings such as educational institutions, workplaces, and social environments. The system's usability, accuracy, and effectiveness in converting sign language to speech should be validated through rigorous testing and evaluation, ultimately leading to improved accessibility and inclusivity for individuals who are deaf or hard of hearing. Additionally, the successful deployment and adoption of this technology in practical scenarios would signify its positive impact on promoting communication equality and fostering greater understanding and collaboration among diverse communities.

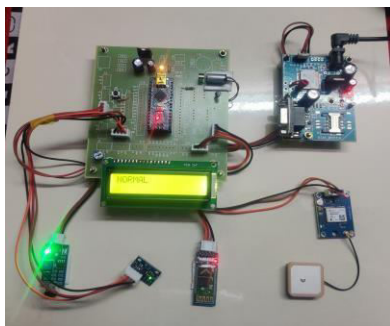


Fig 3: Output 1 Normal

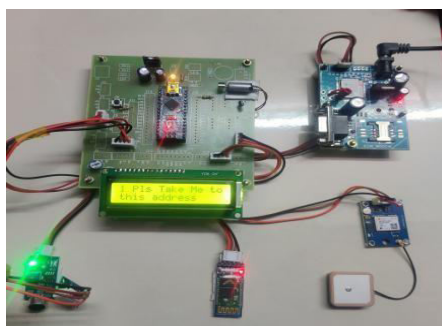


Fig 4: Output 2 Take me to this address

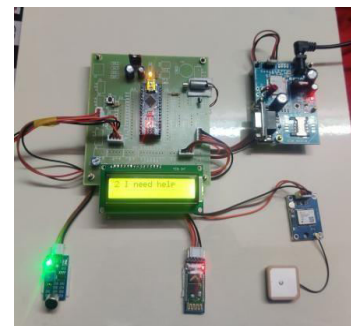


Fig 5: Output 3 I need help

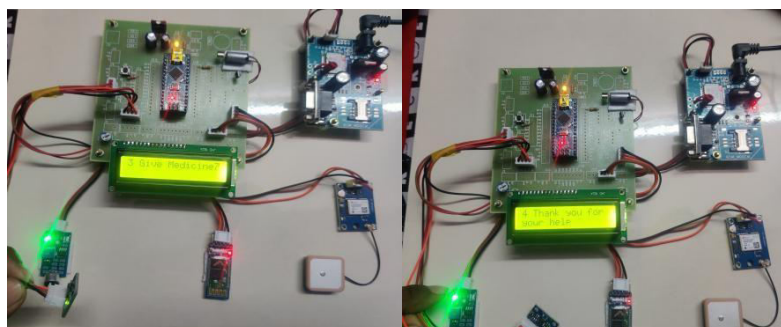


Fig 6: Output 4 Give Medicine

Fig 7: Output 5 Thank you for your help

VII. CONCLUSION

This project is dedicated to reducing the communication gap that exists between the mute community and the broader population. Its primary objective is to create a system capable of converting language into a spoken voice that is readily understandable by both deaf individuals and those who cannot speak. By doing so, the project aims to facilitate smoother and more inclusive communication between these groups and the general public. The system's functionality is designed to ensure that the spoken voice generated from the language is clear and comprehensible to individuals who are deaf or have difficulty speaking. This involves employing technologies and techniques that prioritize clarity and simplicity in the conversion process. The experimental analysis perfectly paired with the mobile application to convert the hand gesture to speech conversion.

VIII. FUTURE SCOPE

Enhancing inclusive communication through the transformation of sign language into speech holds significant promise for the future. Technological advancements, particularly in the fields of machine learning and artificial intelligence, are poised to revolutionize how sign language is recognized and translated. These advancements could lead to more accurate and efficient systems capable of understanding and interpreting the nuances of sign language gestures. By harnessing the power of wearable devices, such as smart glasses or wristbands, individuals could have access to real-time translation services wherever they go, facilitating seamless communication in various environments. Similarly, the development of user-friendly mobile applications could empower users to communicate effectively on the go, whether in educational institutions, workplaces, or public spaces.

REFERENCES

1. Chang, V., Eniola, R.O., Golightly, L. et al. "An Exploration into Human-Computer Interaction" Hand Gesture Recognition Management in a Challenging Environment Original Research Open access Published: 12 June 2023 Volume 4, article number 441,(2023).
2. Noraini Mohamed, Mumtaz Begum Mustafa, Nazeen Jomhari "A Review of the Hand Gesture Recognition System" Current Progress and Future Directions November 2021 IEEE Access PP(99):1-1.
3. Munir Oudah, Ali Al-Naji and Java Chahl, "Hand Gesture Recognition Based on Computer Vision", Submission received: 23 May 2020 / Revised: 15 July 2020 / Accepted: 21 July 2020 / Published: 23 July 2020.
4. M. Yasen and S. Jusoh, "A systematic review on hand gesture recognition techniques, challenges and applications", PeerJ Comput. Sci., vol. 5, p. e218, 2019.
5. Amarjot, S., Devinder, K., Phani, S., Srikrishna, K., and Niraj, A. "An intelligent multi-gesture spotting robot to assist persons with disabilities", International journal of computer theory and engineering, Vol. 4, No. 6, pp. 1290-1420, 2012.
6. Istvan, I., Zoran, M., and Nikola, D. "Hands-free voice communication with TV", IEEE Transactions on consumer electronics, Vol. 17, No. 2, pp. 1378-1695, 2011.
7. Joyeeta, S., and Karen, D. "Indian Sign Language Recognition Using Eigen Value Weighted Euclidean Distance Based Classification Technique", International journal of advanced computer science and applications, Vol. 4, No. 2, pp. 434-820, 2013
8. Kekre, M., and Vaishali, K. "Speaker identification by using vector quantization," IEEE Transactions on mechatronics, Vol. 15, No. 1, pp. 1034-1620, 2010.
9. Mark, H., Rebecca, P., Peter, O. "A voice-input voice-output communication aid for people with severe speech impairment", IEEE Transactions on neural systems and rehabilitation engineering, Vol. 21, No. 1, pp. 1534-4320, 2013.

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