A HAND SIGN RECOGNITION DEVICE

Aarushi Luthra	Naman Sharma	Rizul Kalra	Shaswat
102005068	102005069	102005064	102005119

Electrical & Instrumentation Engineering Department, TIET, Patiala

Faculty Supervisor
: Prof. Sunil Kumar Singla
: Dr. Gagandeep Kaur
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INTRODUCTION

- Imagine a world where the eloquent flow of hand gestures becomes instantly understood, bridging the communication gap between the deaf/hard-of-hearing and hearing communities. Hand-Sign Recognition System takes this vision from dream to reality, translating real-time sign language into spoken words or text.
- No longer reliant on interpreters or cumbersome text-based methods, individuals with hearing impairments can engage in seamless conversations, participate in meetings, and fully immerse themselves in everyday life.
- Technology should not be a barrier. System utilizes the robust and affordable Raspberry Pi platform, making it accessible for individuals and communities.

AIM, OBJECTIVE, DELIVERABLES AND NOVELTY

- Aim: The aim of the project is to bridge the communication gap faced by individuals with hearing and speech impairments.

Objective:

The objectives of this project are:

- Bridge the communication gap between deaf and hearing individuals using real-time sign language recognition.
- Develop a robust and accurate system capable of recognizing a wide range of hand signs across sign languages.
- Design an affordable and portable system accessible to a diverse range of users and environments.

Deliverables:

- Silent voices understood: Hand signs become spoken words in real-time, bridging the gap between deaf and hearing worlds.
- Empowering independence: Access education, jobs, and everyday moments. Break communication barriers, build confidence.
- Smart & customizable: AI powered, recognizes diverse signs, adapts to regional variations. Affordable and portable for all.

Novelty:

EXISTING	PROPOSED
• Current sign recognition systems often grapple with limitations. Expensive hardware and complex software confine their reach to a privileged few. • Existing systems can also feel rigid, lacking the ability to adapt to unique signing styles and regional variations.	•The project proposes a robust and portable hand-sign recognition system built on the Raspberry Pi platform, featuring real-time recognition, customizable sign language databases, and a user-friendly interface. •The customizable databases provide the solution, empowering users to tailor the system to their specific needs.

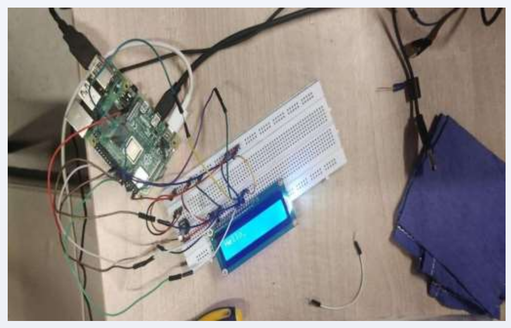


Figure 1. Actual Prototype developed by the Team

METHODOLOGY

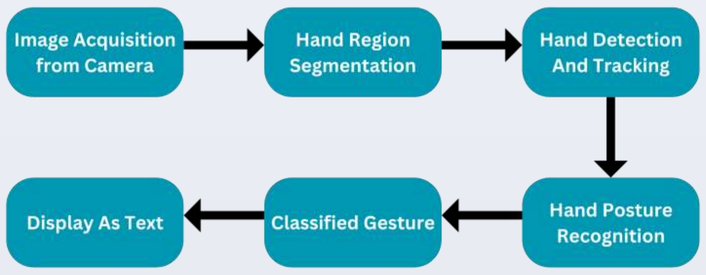


Figure 2. Shows a Flow chart with the steps of approach

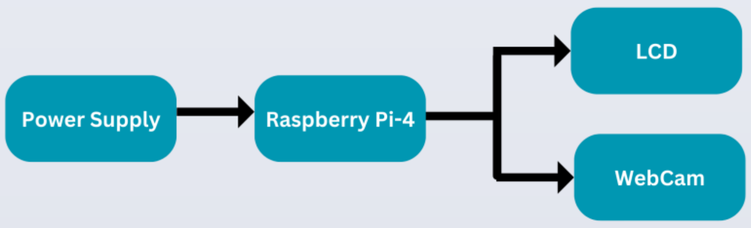


Figure 3. Shows a Flow chart in which Components are Connected.

STANDARDS

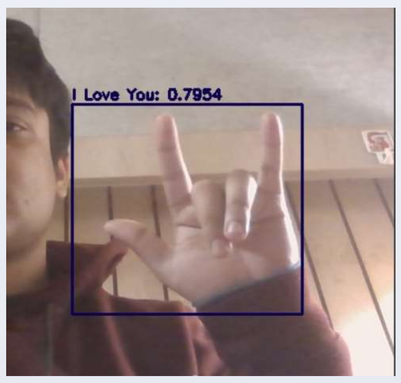
IEEE 802.11 (Wi-Fi) Standards	These standards cover wireless LAN (Local Area Network) technologies, which may be relevant for wireless connectivity in the projects.
IEEE 1149.1 (JTAG)	The IEEE 1149.1 standard, also known as Joint Test Action Group (JTAG), is used for debugging and testing electronic circuits, including integrated circuits on a PCB.
IEEE 754 (Floating-Point Arithmetic)	IEEE 754 is a standard for floating-point arithmetic in computing, which is relevant for projects involving numerical calculations or data processing.

RESULTS

Step 1- Capturing Image of Hand Gesture using WebCam.

Step 2- Data Analysed through Dataset Present

Step 3- Hand Gesture is Analysed and Circuit is Active.



Step 4- Output Text is Displayed on the LCD.

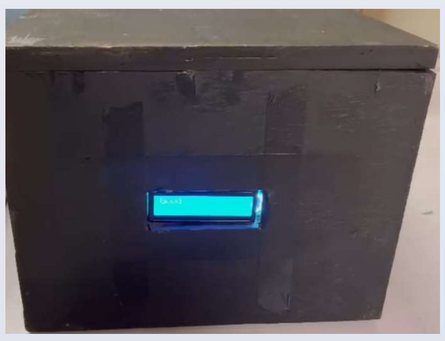


Figure 4.Shows a Simulation of Recognition System

CONCLUSION

- Promotes communication: Bridges spoken and sign language, enhancing deaf inclusion.
- Empowers deaf communities: Offers tools for self-expression and education.
- Challenges remain: Accuracy limitations, cost, biases, replacing human interaction.
- Future focus: Personalization, multimodal recognition, AR integration, deaf-centered development.
- Potential: Significant for communication and deaf empowerment, with responsible growth.

REFERENCES

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