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InnoQuest Hackathon 2025

1.Problem Statement Title-

2.Domain- Healthcare

3.Team ID- HC05

4.Team Name- SignBridge

5.Team Members:

#Arnav Yadav
#Kalpak Gugale
#Rohit Desai
#Riya

SignBridge

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HELLO

GOODBYE

PLEASE

THANK YOU

YES

NO

SignBridge

Problem Statement

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- To help normal people communicate easily with deaf and mute individuals or vice versa.

Solution:

- The app bridges the gap between the deaf/mute community and the rest of society by translating hand gestures into understandable text or voice in real time. It empowers both sides to communicate freely and independently.

Tech Stack

Part of the Project	Tools/Technology	What It Does
Programming Language	Python	The code will helps us :- To assign the text for each sign/image To give the text prompt for the detected matched sign.
Hand Tracking	MediaPipe (by Google)	Detects hand and fingers using the webcam in real-time. Helps the computer **see and understand your hand movements** using the webcam — without needing any special hardware or ML training.
Webcam Access & Display	OpenCV	It allows Python program to **open the webcam**, **show video.** Let mediapipe **draw things** on the screen — like hand tracking and text.
User Interface (UI)	OpenCV Window	A simple window that shows the camera and displays the detected sign. Shows the text prompt.
Where It Runs (Environment)	Laptop (Local Computer)	Everything runs directly on a laptop. No internet or website is needed.
Code Hosting	GitHub	We uploaded our code to GitHub for easy sharing and submission.

Add-Ons

Machine Learning can be used to recognize more complex hand signs by learning from real gesture data. Like Tensor Flow

Detected signs can be converted to voice using text-to-speech, helping communicate with people who cannot read.

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Technical Approach

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Record the disabled person

Step 1

System will match form memory

Step 2

Output will be displayed as text

Step 3

Technical Approach

Start the Webcam

- The app uses the computer's webcam to capture live video using tool OpenCV.

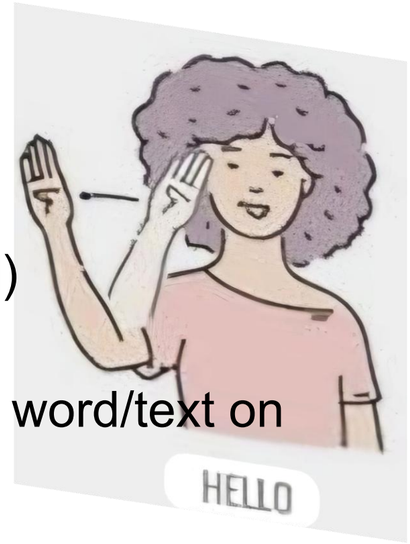
Detect the Hand Using MediaPipe

- We use MediaPipe, a tool by Google, to detect hand and finger points.
- It tracks 21 key points (called landmarks) on the hand.
- It works in real-time and doesn't need any internet connection.

Recognize the Hand Gesture

Instead of training a model, we use simple rules based on finger positions.

- Example:
  - If all fingers are open → it's an open palm → it will show "Hello"
  - If the thumb is up and others are folded → it can mean "Yes " (pre-added)



Show the Result on Screen

- Once the gesture is recognized, the OpenCV windows shows the matching word/text on the webcam video.
- This makes it easy for non-sign language users to understand the sign.

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Conclusion

This project is more than just a technical innovation — it’s a step toward social inclusion. By empowering the deaf and mute community to express themselves freely, our app helps create a society where everyone is heard and understood.

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1) moneycontrol.com
2) ai.google.dev
3) chuoling.github.io
4) Python
5) ChatGPT
6) Gemini
7) handtalk.me

Gemini

GitHub