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The Problem:

Approximately 90-95% of deaf kids are born to hearing parents who often don't learn sign language and do not have a healthy relationship with their children since the communication is greatly lacking. On the other hand, deaf individuals are often viewed as not intelligent or not bright due to the language barrier. In the Middle East, about 3% of the population suffers from hearing loss. It can be challenging to get a face-to-face interview stage due to revealing their hearing situation on application forms, as recruiters see it as an extra effort to communicate with them. Also, telephone interviews.

Are inconvenient without interpreters. They can be costly and hard to get in a short period as many interpreters don't make it on time.

The Objective:

Technology is helping to close the gap. Smart gloves intend to empower deaf individuals to communicate independently without relying on interpreters or written communication, thereby fostering a greater sense of autonomy.

The Methodology:

This project working principle is experimented with a mixed-method and consisted of the combined hardware and software design. In contrast, ASL translation is divided into three main stages:

• Recognizing sensor's values

• Processing the values

• Displaying the sign in android application

The Result:

The hardware in this project includes five flex sensors in each pair a rotation sensor MPU6050 connected with ESP32 through Bluetooth and an output subsystem with an android application (Bluetooth Serial apps used for testing). Selecting the correct type of sensors for measuring the finger joints' bend value is crucial. Here, flex sensors have been chosen that are essential for taking the user's input. The outcome of this project was to detect American Standard sign language alphabets and some words whereas successfully displayed into text then convert it to speech through an app on an android phone, which can help speech impaired and hard of hearing people communicate with hearing people. It can easily use by wearing gloves by the user and making different gestures with fingers, so each flex sensor can detect the values through a range of resistances and take different ranges for each position.

The Conclussion:

As indicated from the accumulated data, the involvement of technology in the matter is vital for the integration and professional development of deaf individuals. Hence, sign language interpreting gloves as the core of this project, gave us a sense of closure of what to expect from modern technology.

Using just five flex sensors and an accelerometer with ESP32 in the gloves promotes freedom and independence by providing easier and smoother communication to bridge both deaf and hearing communities. This technology will not only fight the stigma that has been attached to the hearing-impaired, but it will also create more opportunities and build deeper and stronger relationships.

It is realistic to say that with an expanded vocabulary over the years, these gloves can do wonders and possibly for the first time, it could lesser the need for a physical sign language interpreter or entirely omit it with time.