

SmartGlove: Gesture-to-Speech Conversion

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Abstract: *The Smart Gesture Glove is intended to assist individuals with hearing and speech impairments to communicate more freely through the translation of hand movements into speech or written word. Employing a combination of flex sensors and inertial measurement units (IMUs), the glove monitors hand movements in real time precisely. It's been made to be comfortable and convenient, and thus available to individuals of all ages and abilities. In addition to gesture recognition, the glove also incorporates features for detecting obstacles, which can be particularly useful to the visually impaired. Its uses extend far beyond the realm of assistive technology—it can be employed as an educational tool for sign language and enhancing classroom life. In the future, future modifications could include sophisticated sensors for enhanced accuracy and smart device compatibility to extend its capabilities. Ultimately, the Smart Gesture Glove is not simply a piece of technology; it's a step toward a more inclusive world, allowing people with impairments to communicate more freely and to better understand one another*

Keywords: Gesture recognition, speech impairment, assistive technology, sign language translation, wearable device, speech synthesis, flex sensors, accelerometer, ESP32, Bluetooth communication, obstacle detection, gesture-to-speech conversion, hand gesture recognition, disability aids, communication device

