

Speaking System for Mute People using Hand Gestures

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Abstract: *Communication is a fundamental human need, yet millions of people with speech disabilities face challenges in expressing themselves effectively. This paper presents a gesture-based speaking system designed to bridge the communication gap for mute individuals. The system uses a combination of sensor-equipped gloves and machine learning algorithms to recognize specific hand gestures and translate them into audible speech in real time. Accelerometer and flex sensors capture hand movements, which are then processed using a trained classification model to identify corresponding text and convert it into voice output through a text-to-speech engine. The proposed solution offers a low- cost, portable, and user-friendly alternative to traditional communication aids. Extensive testing demonstrates high gesture recognition accuracy and real-time performance, making it a practical tool for enhancing social inclusion and independence for speech-impaired users.*

Keywords: Hand gesture recognition, assistive communication technology, speech-impaired support, gesture-to-speech conversion, wearable device, real-time translation, sensor-based glove, machine learning, text-to-speech system

