

# **Paralyzed Patient Monitoring System**

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**Abstract:** *Paralyzed and bedridden patients often struggle to communicate their needs due to limited speech and mobility. This creates delays in receiving essential care such as food, water, restroom assistance, or emergency help. The proposed hybrid Paralyzed Patient Monitoring System integrates ESP32-based sensor input and laptop-based computer vision to recognize non-verbal gestures such as hand movement, eye-blinks, and head gestures. The system sends clear audio alerts and Bluetooth-based notifications to caregivers, ensuring fast response and improving patient comfort. This low-cost, multi-modal assistive system enhances communication reliability and reduces caregiver dependency.*

*The system utilizes an ADXL345 accelerometer to detect intentional hand or arm movements, while OpenCV-based eye-blink and head-gesture recognition provides additional communication options for patients with extremely limited mobility. Each gesture is mapped to specific service requests—such as water, food, restroom assistance, or emergency help—which are then communicated through clear audio output from the laptop and Bluetooth alerts sent to a caretaker's Android device via the HC-05 module*

**Keywords:** Paralyzed and bedridden patients

