

## ABSTRACT

*An unhealthy lifestyle and an unbalanced diet are the main factors for stroke, which is the main cause of death in almost all hospitals in Indonesia. The aim of this research is to develop a low-cost open-source exoskeleton hand using a servo motor based on signal control electromyography (EMG) equipped with an angled joint. The main advantages of this proposed method are low cost, lightweight, and simplicity to control the exoskeleton's hand using only a single channel. This was achieved with a DC motor, and the presence of an EMG signal was explored. The active electrode records the EMG signal from the extensor carpi radialis longus, flexor carpi ulnaris, and flexor carpi radialis. Furthermore, the A/D converter on the ESP32 microcontroller converts the analog signal to digital. The Servo motor controlled each finger for flexion and extension motion. In the design assessment that produces the highest accuracy value is the flexor carpi radialis muscle with an average accuracy value of 95% for closing movements and 93% for opening movements, respectively. This research has demonstrated a low-cost, open-source exoskeleton hand design that is affordable and lightweight.*

---

**Keyword:** *EMG, Myoware, Exoskeleton, ESP32*