

## ABSTRACT

*Stroke is a disorder in which certain brain cells die unexpectedly. Bilateral therapy with a hand exoskeleton is one type of treatment that can be used. One of the issues with bilateral therapy is that the sensor data on the linearity of motion on the hand exoskeleton are insufficient, reducing the effectiveness of bilateral therapy. The goal of this research was to create a hand exoskeleton control system that used the GY-521 sensor to regulate the angle of movement of the five fingers that will be attached to the metacarpophalangeal bones, allowing each finger to move independently. The sensor employed in this study is the GY-521, which combines an accelerometer and a gyroscope in one module. The GY-521 sensor does not require recalibration and improves the precision of hand exoskeleton control, making it easier for users. The hand exoskeleton control mechanism was employed in this study. The greatest RMSE value in this sample was 11.07, and the lowest RMSE value was 7.13, with an average RMSE of 8.99. These findings suggest that a mechanical exoskeleton hand can be built with a motor that can move if the researcher's expectation of reading the WeMos ESP32 Mini angle value is met. The creation of this study is expected to support the activeness and independence of these post-stroke patients, allowing them to have faith in themselves and be driven to heal rapidly. The creation of this study is expected to support the activeness and independence of these post-stroke patients, allowing them to have faith in themselves and be driven to heal rapidly.*

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**Keyword:** *Stroke, Hand Exoskeleton, GY-521 Sensor, WEMOS D1 Mini ESP32*