CERTIFICATE

Certificate ID: 451968530 Time & Date Of Publication: 11/24/2026 09:21:13

Title:

AI-Enabled EEG-Based Robotic Hand Control for Sustainable Healthcare and Assistive Technology.

Author Name:

Armaan Ahmed Firoz

ID Number:

6536

Description

This software implements a real-time brain-computer interface (BCI) for controlling a five-finger robotic hand using EEG signals, a NeuroSky MindWave headset, and an ESP32 microcontroller. The software receives brain activity data wirelessly through Bluetooth, processes attention and meditation values, validates data integrity, and monitors EEG signal quality. A moving-average filtering algorithm and dual attention thresholds improve control stability and reduce unwanted movements. The robotic hand opens or closes according to the user's attention level, using five servo motors controlled through a PCA9685 PWM driver. The software also provides smooth finger movement, automatic Bluetooth reconnection, and real-time EEG data monitoring. Potential applications include assistive robotics, rehabilitation, human-machine interaction, healthcare technology, and smart prosthetic systems.

Chairman

K.Schreiber