MyGlove: Assisting Hand Movements, Grip, and Tremor

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Loss of control over hand motor ability and voluntary movements, as well as tremor, is seen in numerous people including those with neurological diseases. This reduces the quality of life and makes it very challenging to accomplish essential everyday tasks. MyGlove is an innovative wearable that assists with hand movements and improves grip. The design consists of a glove, microcontrollers, sensors, and servos. The program algorithms developed using the portable Arduino C language read sensor data and appropriately actuate the servos for assisting with hand movements and grip. In addition, tremors are detected using sensors and controlled using pneumatic actuators. A 3D printed hand controlled by a different microcontroller circuit is used to model a human hand. MyGlove's functionalities of assisting hand movements, improving grip, and detecting and controlling tremor have been developed and validated. Algorithms have been fine-tuned and re-verified. MyGlove's assist functionality successfully helps in closing the hand faster than without it. The assist functionality will also be more effective on a real hand without the constraints of a modeled hand. MyGlove additionally improves grip for holding objects and accurately detects and controls various tremors. Based on the severity of involuntary hand movements and tremors, customization of the assist strength factor and tremor control parameters have been effectively tested. MyGlove's user-friendliness, customization, and features can also be enhanced further. The use of MyGlove will greatly lead to a higher quality lifestyle for a wide range of people impacted with tremor and the loss of hand motor control.

Awards Won:
Third Award of $1,000