Muscle Controlled Exoskeleton

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There are thousands of people who have movement disabilities and have difficulty with simple tasks such as carrying a grocery bag or pushing a door open. The muscle controlled exoskeleton is the next breaking invention that can improve the quality of life for these people. For the lower part of the exoskeleton, linear actuators are positioned on the legs and can be moved wirelessly to allow the person to walk and bend down with the exoskeleton supporting their body. To bring this idea to reality, this project utilizes muscle sensors and Arduino technology to receive nerve signals in muscle activity and transmit this signal to the Arduino where it sends the signal to the servo telling it to move the arms. The frame to support this exoskeleton was constructed from reinforced aluminum making it extremely light and strong enough to support the frame. Carabiners connect the aluminum joined arms to the external frame backpack allowing the user to move freely with no range of motion restriction. During experimentation. During experimentation, 1, 5, and 10 pound weights were tested on each arm. The user attached the muscle sensor to their bicep and when they flexed, recorded how long it took to raise the weight on the arm. After this, the results were recorded and communicated. Overall this project achieved its engineering goal to create a lightweight, affordable, and effective exoskeleton for people with movement disabilities. By utilizing muscle sensor technology, this project advances exoskeleton technology for future innovation and success.

Awards Won:

International Council on Systems Engineering - INCOSE: Certificate of Honorable Mention