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Proyectos III- Project report

Project description

The purpose of this project is the improvement of an arm orthosis. The device already implements an articulation for the elbow and our objective is the creation of a system that rotates the forearm and the wrist in response to stimuli generated by the user. These can be obtained from an EMG signal or by the exertion of force over force sensitive resistors (FSR) or a strain gauge.

Project stages

1) 3D design of the forearm rotation system

The rotation system should be coupled to the one responsible for the elbow articulation. The rotation movements targeted are pronation and supination.

State: The design is completed. The pieces are being printed.

2) 3D design of the wrist rotation system

The targeted movements are flexion and extension. The system may be coupled to the one responsible for the forearm if that increases the robustness of the overall structure of the device.

State: incomplete. Currently under development.

3) EMG/FSR/Strain gauge signal acquisition

Being able to use a signal generated by the user's forearm and wrist to initiate the rotation of the limb. EMG is preferred because it has an easier and less bulky implementation although the use of FSRs or a strain gauge has been considered because of previous experience with the sensors.

State: Incomplete. Waiting for the assembly of the 3D components.

4) Integration of both systems

Once both systems function individually, they must be coupled. Even if the 3D structures are independent, the electronics may be placed together to save space.

State: incomplete.

5) Further adjustments

Once the device is finished, minor modifications may be required both in 3D design and software signal treatment.

State: incomplete. Waiting for the rest of the stages to be completed.