ExoActuator
Team Memo
10/4/20

Joshua Davidson - Torque Measurement/Brake

I will be researching the methods by which both to measure the torque produced from the motor, and how to stop the movement of the motor. This includes devices like disk brakes and prony brakes. This is important to the project as the objective is to create a test stand for the motor, which will need to determine the torque produced by the motor. Braking is also important in how many cycles the test stand can run before parts need to be replaced, and in providing resistance to the motor in order to test aspects of its functionality.

Alex Frieden - Preliminary Frame Design and Force Analysis

I will be working on creating a preliminary design for the frame of our device in Solidworks, then performing a force analysis of the design. This involves me either creating or finding a 3d model of the 80/20 aluminum extrusions, and any fasteners, screws, nuts, etc. needed to create an assembly of the frame in solidworks. Once that is complete a force test needs to be completed to determine how much deflection the frame may have. This is important because if designed incorrectly, the frame will flex too much which will influence our calculations.

Chancelor Cuddeback - Motor Operation

I am responsible for understanding how to control the actuator. This includes, understanding the communication protocol, motor inputs/outputs, and how they may be applied to effectively and accurately control the motor. The motor communicates via CAN, which allows for robust two wire communication. This research is vital, because without effective motor control the team will not be able to validate different control methods. These control methods will later be used to provide assistance to persons with motor impairments, so ensuring their effectiveness is very important.

Callum Fisher - UI Interface with Arduino

I am responsible for learning how to make a UI or User Interface in Arduino for the team to be able to put inputs in and then the motors will react to those inputs. This is done by coding in the Arduino software. The client wants this bench to be easily accessible and easy to use so a touch screen communication interface can be useful for the user of the bench to input commands without opening up the code to type the values in manually. Once a general understanding of how to make an interface is accomplished then the team can move forward on customising the UI to fit the needs of the bench. This will be more challenging due to the fact that the UI will have to interact with the other coding language CAN. Making this UI as simple as

possible but also as effective as possible will be very important for future uses of this bench going forward.

Abdulrahman F Alshammari - Thermometer

The tasks assigned include designing of a thermometer device for temperature sensing of the motor while testing of the motor. The task involves designing of the electrical circuit, programming of the Arduino UNO microcontroller, and providing a system for efficient data capture and data logging. AMP37 sensor will be used for temperature sensing and Arduino Uno for processing and datalogging. A complete circuit diagram and electrical component list will be provided at the end of the assigned task including an interrupt-based Arduino Uno Code.