



Strength Assisting Orthotic

ECE Team 10 / ME Team 29

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Aim: To build a strength assisting orthotic to increase users strength and endurance.

Introduction

For an orthotic to be useful, it is important for it to be light weight and move as the user would naturally. Previous orthotics are heavy and limit the user's movements.

Objectives

- Build a strength assisting orthotic that increases the curl strength of the user by 20 lbs.
- Constraints are safety, weight, strength, lifespan, and versatility.
- Build Prototype using \$1,400 budget.

Manufacturing



Figure 1 – 40 % scale prototype of arm

Prototype

- The frame of the orthotic will be made out of aluminum and will be conventionally machined.
- It will have two slider bars to allow for a range of 95% of the worlds population to use.
- Actuation of the orthotic will occur at the elbow with the use of a worm gear.
- Use a backpack type frame to distribute moment of inertia

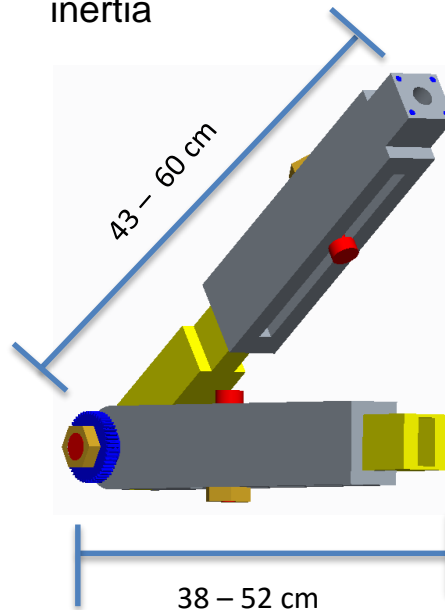


Figure 2 – Frame Design

System Overview

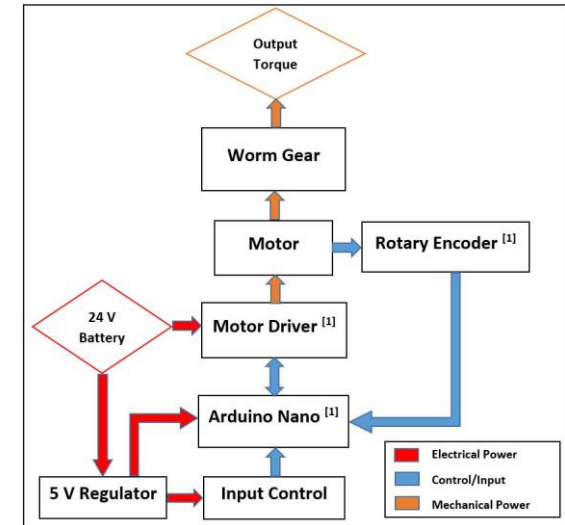


Figure 3 – Control Design

- Converts electrical energy into mechanical energy to provide torque about the elbow required for assisted lifting.
- Multiple safety redundancies

Future Plans

- Finish ordering Parts.
- Work on safety clearance.
- Build final Prototype.