

ENGR 499

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### GCSP Outside Activities

#### Outside Activity 1: Research (3/4/2024)

Since January, I have been assisting Dr. Thomas's team in the Human-Empowering Robotics and Controls (HERC) lab. I was placed on the hip exoprosthesis 'human gripper' project under PhD student Jadon Kaercher. In many exoskeleton projects, the largest challenge comes in the time delay, which is commonly solved with some level of path prediction. The goal of the hip exoprosthesis project is to create a system by which the user leg moves as little as possible so that the motors (which are significantly faster and stronger than the leg of the user) can do more of the work, faster. The goal of the 'human gripper' project is to create a frame that can effectively transfer the now increased forces between the metal frames and actuators and the much softer (but force-driving) leg of the user. Many systems that allow for a large amount of 'slop' in their systems add bad data into their path tracking models, which can lead to disastrous results in incorrect movements of the frame. This creates the unique challenge to be addressed by the 'human gripper', to comfortably but tightly hold the leg of the user, and on that sub-project, I am responsible for the ankle and foot mounting system.

#### Outside Activity 2: Multicultural (3/4/2024)

For the last 5 years (since 5/5/2018), I have been a member of The Order of the Arrow, an honor society that takes a large part of our ceremonial practices from local native American tribes. Nationally, our organization takes inspiration from the Lenne Lenape tribe (also called the Delaware Indians), however our local lodge has chosen to work with local representatives from the Caddo and Commanche tribes to ensure that our regalia is accurate to the period we intend to represent. Normally, I use the Caddo-inspired regalia, however because of some last-minute logistical challenges, this weekend I used Commanche regalia. Through working with this organization, I have had the incredible opportunity to go many incredible places, but this weekend, I was hosting what for many tenured members is their final ceremony. Each year, the lodge (~1000 members) is allowed to select 2% of its membership that to receive what is known as The Vigil Honor. I delivered the Vigil ceremony to 7 of my peers that I have had the privilege of mentoring and working with over the course of the last 5 years.