

Dustan Kraus

Levi Rupert

### **Filtering for Joint Angle Estimation on a Soft Robot**

#### **Project Goal:**

We are currently using an HTC Vive for joint angle estimation on King Louie (one of our soft robots). This works well; however, we are just accepting the measurement as the robot's configuration rather than using it as a measurement update to get a state and covariance estimate. For our project, we are going to implement at least one filtering technique on King Louie's joint angles. We are planning on implementing both a UKF and Monte Carlo localization to compare the results if we have adequate time (we will only implement 1 if it proves to be more difficult, or both if it isn't too bad). Right now, we are getting joint angle estimates at 300 Hz. We would like to get filtered joint angles at about this rate if possible. At the end of our project, we hope to have a working filter for King Louie's joint angles.

#### **Intermediate Milestones:**

- November 2: Have the dynamic models and sensor models fully developed
- November 30: Have the filters coded in python and running (not necessarily working) on the robot without syntax errors
- December 13: Have the filters fully working and tuned on the robot

#### **Resources Needed:**

We already have the hardware and software resources necessary to complete this project