Let’s make some bullet points for what I have done in the research

* Done
  + Covers
  + Wrote code to read from analog force-torque sensor and log data as the robot pokes the silicone
* In progress
  + Writing code and doing electronics for 1-DOF actuator to poke silicone samples with a needle to verify sample’s mechanical properties
  + Writing code to find position and orientation of the camera

Project:

My project was to create a breathing lung phantom for use while developing robot guided percutaneous lung biopsy and ablation procedures. I researched and selected materials that mimic human tissue when scanned in a CT scan or poked with a needle. I wrote the code for a simple 1-DOF robotic actuator to poke silicone samples with a needle attached to a force-torque sensor to verify each sample’s mechanical properties. I wrote code to read the analog signals from the sensor, convert them to forces, and log the data during the poking routine. With this setup, we can validate whether the phantom’s materials are similar to human skin. Currently, I am developing a technique to find the pose of a marker attached to the phantom from the CT scan image. This will help robots to find the phantom using the CT scan.