Aristos

Robot Code Notes

Post Object --> position and orientation in space

Motors Object --> motor positions

-Navigation not really relevant to me. That is for going through the lung.

Look in Trajectory instead.

-Trajectory arrays are relative to the starting point. For example, array [0,0,0,0] is just your starting point. Array [1,0,0,0] is just 1mm further in the x-direction from the starting point.

-Robot frame is relative to the base. So along that z-axis is where insertion nis.

-Nav does frame changes. Basically ensures that the frame you enter the coordinates in (for examples quare) are in the same frame as the robot.

-Get Curvature --> Forward Kinematics. Basically if you tension the tendon in a certain way, calculate what curvature should result. The derivative of this is the Jacobian.

-Lung trajectories are global coordinates, square/circle etc are not.

-What are Global Coordinates? Most trajectories are relative to the current position (wherever that may be). In the lung, the lung is fixed relative to the sensor base; you care where you are. That’s why lungs use global coordinates, because if you are in a certain area you can’t move in certain directions.

Next Steps

-Keep reading code. Pay attention to Catheter model

-I will want to create the Cardiac Catheter. Main difference is there are motor inputs

-Make Catheter subclass that is Cardiac Catheter

-Pay attention to get\_sensor\_position, because it goes tendon to curvature. Overwrite get\_curvature() in the subclass, so it takes knob inputs. Be careful because q is now 3 long instead of 5.

-Try some hands on stuff to see how the catheter responds to the knob. Push knob by certain distance, measure tip movement

-Also get lengths of tip, etc.

-Do test runs to see what happens

-If these work out, then look at jacobian

-Add a flag that says “instert\_only” or something that would implement point-and-shoot only, so it doesn’t deal with curving the st jude catheter

-Make get\_Leader\_Jacobian in CardiacCatheter

-In CardiacCather, write separate functions for get\_catheter\_jacobian and get\_sheath\_jacobian.

-What is the point of get\_full\_model\_J() in state\_estimation??

-Inverse Kinematics --> Large Motions

-Jacobian Inverse --> Finer motions

-Get points\_along\_body and start “plotting each curve to see what each thing does”

**Questions**

I don’t have:

- rendering\_framework.api.rendering\_api import Render (in cath\_video.py)

- import mpld3 (in make\_video.py)

- Can’t import functions (in make\_video.py)

-What is the frame of get\_position\_from\_curve?

**What I changed**

-Created CardiacCatheter subclass of Catheter superclass.

-In model\_robot.py in get\_base\_pose() I changed q\_ins = q[8] to be q\_ins = q[4]

-in model\_robot.py in scales\_gears\_for\_model, I put if-statements about length of q

-in motor\_control.py in \_\_init\_\_, I changed q\_num to be 8

-in model\_robot.py in get\_Jacobian() I removed motor scaling

-in modellesshelper.py in inv\_equal\_opposite I set tendon\_pairs = 0. Remove J\_add\_on

-in motor\_control.py in scale\_dq() I remove use of dq\_scale vector and just use max\_dq\_scale scalar

-in motor\_control.py in check\_limits() I made the comparisons only check the first 8 values (instead of 10) by slicing max\_position\_rel

-in motor\_control.py in move\_dq() where it calls SetDesiredPosition() I removed the asterisk in front of the arguments

-in state\_estimation.py in get\_full\_model\_J() and get\_tip\_pose\_in\_base\_frame() I changed the indexing of q from q[-1] to q[4] to accommodate change initial insertion.