MECH 501 Assignment

Research Questions:

### Can Deep Reinforcement Learning be used to recreate standing and walking stability under sarcopenia conditions?

Simulator:

**MyoSuite,** contact-rich framework for musculoskeletal motor control**, to simulate and train muscle activation.** Specifically, I will be using MyoLeg, to add in sarcopenia conditions and design own reward policy.

The packages are available in both:

<https://github.com/vikashplus/robohive>

Implementation:

1. Utilize the Gym Environment given by MyoSuite, specifically the environments:
   1. MyoLeg: 10 joints, 20 DoFs, and 80 muscles-tendon units[[1]](#footnote-1).
   2. myoLegStairTerrainWalk-v0
   3. myoLegWalk-v0
   4. myoLegStandRandom-v0
   5. myoLegReachRandom-v0
   6. **Sarcopenia**: myoSarc<Environment> **e.g.,** myoSarcHandPoseFixed-v0
2. Uses DeepRL and actor-critic method.
   1. Proximal Policy Optimization (PPO) actor-critic algorithm to train the model.
   2. Two layers of neural network A skeleton with red veins

      Description automatically generated

1. 10.1109/TBME.2016.2586891 [↑](#footnote-ref-1)