

Week 6: Biomechanical Simulation



A6a: Movement prediction (mandatory, 5p)

This exercise is done in the provided Colab notebook. If you missed the lecture, or are not familiar with Colab, please take a look at these [tutorials by Google](#). Also, take a look at this [project page](#) to understand how user-in-the-box is organized.

Goal: In this exercise, we will use a pretrained model to make predictions for different movements, and we plot and analyze the results. The learning goal is to understand what the model does.

This part is broken down to four subtasks, as follows:

- Task 1a: Run the pointing model with two different action sampling frequencies. The action sampling frequency determines how often an action is sampled from the learned policy. A lower action sampling frequency means the simulations run faster, and may mitigate the credit assignment problem in RL, but the resulting movements are laggier and jerkier.
- Task 1b: Plot the (x,y,z) coordinates of the end-effector for both simulations.
- Task 1c: Compare the average muscle activations for each run.
- Task 2: Run the tracking model with a prespecified (circular) trajectory.

Notes:

- File navigation needed: The notebook will ask you to navigate in the file structure and edit/run files (such as evaluator.py and some log files). You can find the Files menu in the menu on the left.
- Random seed is set to 1 in one of the cells. Why is that?

Report:

- Offer numbered sections according to tasks (e.g., “Task 1b”)
- Focus on providing a clear explanation of what
- Include screenshots of the key parts of code
- Attach a PDF copy of your Colab notebook

Grading: It's not a feat to get the cells running. The question is: What do the results *mean*? The focus in grading is on how well you understand what is going on. You need to explain your results as understandably but also technically precisely as you can.