

Optimization exercises

Inside the Homework Assignments folder, you will find the optimization_homework.pdf. It includes some introductory exercises in optimization problems. Provide the solutions and snippets of the code you may use.

Static optimization exercise

In the following link ([static optimization link](#)) you can find the recommended OpenSim tutorial for Static Optimization. Perform the steps and answer the respective questions. Omit the RRA related steps for now. Attach to your project report screenshots explaining shortly the workflow.

Joint reaction analysis exercise

Following the Static Optimization exercise, you can use the Static Optimization results (use the normal reserve actuators study) and perform a Joint Reaction Analysis.

- Create the JRA setup, based on the SO setup (Load and Edit, Change Static Optimization to Joint Reaction Analysis). Run the Tool and provide output only for the right hip and knee joints.
- How can we validate the output?
- Estimate the reaction forces on the knee joint calculated for the tibia and femur and expressed in the common reference frame (ground). What do you observe?

Useful links

You can find useful links in the Lab 3 presentation. Just press on the information icon. A very detailed and useful publication is the following: <https://pubmed.ncbi.nlm.nih.gov/25474098/> . You can access it via sci-hub.

For the JRA the following webinar is extremely insightful:
<https://www.youtube.com/watch?v=ly4rhOOif00&t=2325s>

For any issue feel free to ask!