

MAE 263F: Mechanics of flexible structures and soft robots

Homework 2, Spring 2022

Due: 11/06/2023 11:59 PM

Submission Instructions:

You should create a single GitHub repository for this class and share it with the instructor (khalidjm@seas.ucla.edu). All the homeworks, reports, presentations, and proposal should be uploaded to this repository. Do not create a separate repository for each assignment. Within your repository, create a separate folder for each assignment (e.g., homework 1, homework 2, homework 3, proposal, midterm report, and final report).

In the first two homeworks for this class, we are essentially rapid-prototyping a software that would be useful for the final project. In this prototyping phase, you can use MATLAB, GNU Octave, Python, etc. However, it is highly recommended that you use C/C++, FORTRAN, Java, etc. for the final project to develop computationally efficient codes.

[Optional] Chapter 6 *Discrete Twist* of course notes include three short assignments. You do not need to include your code for this part.

[Required] Chapter 7 *Discrete Elastic Rods Algorithm* of course notes include one assignment on simulation of an elastic rod.

Your submission on BruinLearn should only contain the URL to your GitHub repository. Your GitHub* repository should include the following items:

1. A report in .pdf format (file name should be **Homework2_LASTNAME.pdf**; replace LASTNAME by your last name) addressing the questions asked in the deliverables. In addition to the plots asked in the deliverables, describe your implementation of the DER algorithm. You may want to use a flowchart or pseudocode. See the syllabus for formatting requirements. As asked in the syllabus, you must use one of the provided templates.
2. Source code. The submission should have one file named *exactly* as Homework2.[ext] that implements the 3D simulation; replace [ext] with the appropriate extension based on the programming language* of your choice. You may use as many helper functions/files as needed; however, execution of Homework2.[ext] should right away run the simulation.
3. A README file containing instructions on how to run your code.