

Project Instructions

BIOE/CS/CME/BIOPHYS/BIOMEDIN 279

Due: December 3, 2021 at 11:59 PM

1 Description

The goal of this project is to allow you to explore a topic from the class in more detail. The project should involve structure or spatial organization at a molecular or cellular level. You can work *individually* or in groups of *up to three students*. The project is meant to involve about as much work (per person) as assignments 2 or 3. We expect individuals working in groups to do as much work as those working on their own.

To this end, projects will likely consist of one of the following:

- Implementing an algorithm discussed in class
- Use an existing software package to perform computational experiments and analyze the results.

You may also do a project that is mostly theoretical, but we'd recommend running it by the TAs first.

2 Deliverables

You are to turn in a written report summarizing the results of your project and your code. The report should be:

- 2-4 pages for individual projects
- 3-5 pages for groups of two
- 4-6 pages for groups of three

with 12pt font, double spaced, 1-inch margins, not including charts/figures.

Report Structure

The report should consist of the following sections:

- **Introduction:** Identify the problem you wish to solve and the scope of your project.
- **Background:** Include a brief section on the background of the problem: why is it important and what techniques have people used to solve it?
- **Methods:** Describe how you went about solving (or trying to solve) the problem.
- **Results and Analysis:** Present any results and conduct an analysis of your experiments/implementation. Requirements for this section will vary depending on whether you worked on an implementation project or used existing software. Please see the [Results and Analysis](#) section below for details.
- **Contributions:** If you are working in a team, describe each team member's contribution.

Results and Analysis

This section will vary slightly between projects that involve significant implementation and projects which use existing software.

Implementation Projects

In the Results and Analysis section, you should include some discussion of the following.

- Describe the major design decisions in your implementation.
- What challenges did you encounter?
- How well does your implementation work?
- What did you learn through implementing the project? Any major takeaways?
- What are the “next steps” in the project (if you were to continue working on it)?

You will also be expected to submit your code and a description of how to build/run it. You **must** clearly cite all starter code, including code that you wrote for another class.

Using Existing Software

In the Results and Analysis section, you should include results of your experiments as well as an analysis of their quality.

- How do the software packages you used work? Are there other approaches that might work? What are the tradeoffs between these approaches?

- What were the results of your experiments?
- Do these results seem reasonable? (Are they physically realistic? Do they match your intuition?)
- What did you learn by running the experiments?
- What are the “next steps” in the project (if you were to continue working on it)?

In either case, you should give some explanation of how your project fits into the larger context of the class and computational biology.

3 Sharing a project between classes

If you’re simultaneously enrolled in another class that requires a final project, you can do one combined project for both classes (contingent on the agreement of the other course’s staff). However, this should not reduce the total amount of work you do for the two class projects. If you choose this option, please specify clearly in your submission which sections of the work were done for each class; the amount of work for this class should be as much as if you were doing a project only for this class. Please also include your writeup for the other class with your submission.

4 Submission Instructions

Only one submission is required per group, so please be sure to indicate who is in your group at the top of your report, which you should save as `writeup.pdf`. Please zip your code and any data you used in a file called `code.zip`. If you didn’t write any code, please write up a text file (`ReadMe.txt`) describing the software packages you installed along with the commands you used — please zip the Read-Me file(s) and name it `code.zip`.

To submit, go to Gradescope and upload `writeup.pdf` to the “Final Project Writeup” assignment and `code.zip` to the “Final Project Code” assignment.