Project introduction and topics

CS 279 / BIOE 279 / BIOPHYS 279 / BMDS 245 / CME 279

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Project Guidelines

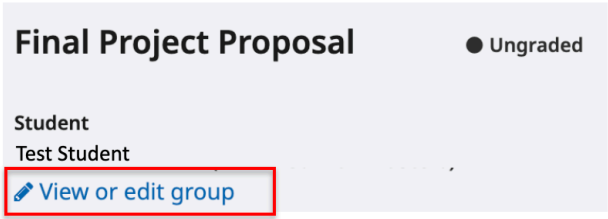
- You are most welcome to pick something that is not mentioned in these slides
- **The key requirement for a project topic is that it must involve 3D structures of biomolecules and/ or spatial organization of molecules within a cell**
  - Of course, it should also involve (or at least relate to) computation
  - Machine learning projects are great, *as long as they explicitly involve 3D structures of biomolecules or spatial organization of molecules within a cell*
  - Image analysis is great, *as long as the analysis you do provides information on 3D structures of biomolecules and/or spatial organization of molecules within a cell*

Project Guidelines

- Projects can be methods-focused and/or application-focused
  - You can code/modify software
  - You can apply existing software to a biological problem. *Coding is not required!*
  - You can also carefully compare the results/performance of several software packages.
- You can work individually, or in groups of 2 or 3
  - In any case, we expect the same amount of work *per person* (which should be similar to assignments 2 or 3).
- See Project Instructions document on website for other information
  - Including overlap with projects for other classes

What you need to submit

- Project Proposal (due Mon., Nov. 16th)
  - Fill out the form on Gradescope. Submit one proposal per group and add all members to the submission.



  - This is just to get you started early and identify potential challenges. All complete, on-time submissions will receive full credit.
  - Keep responses brief. About one sentence per question.
  - Your choices are not final! This is just to get you started early and help identify potential challenges.
- Project Report (due Fri., Dec. 4)
  - See Project Instructions document on website for requirements
  - Please include analysis/discussion of your results in the report
- Reminder: you may not use late days for the project

Topics

- Your project may relate to topics we'll cover in subsequent lectures (small-molecule docking, virtual screening, x-ray crystallography, cryo-electron microscopy)
- Again, the key requirement for a project topic is that it must involve 3D structures of biomolecules and/or spatial organization of molecules within a cell
  - Topics/approaches not covered in this class are acceptable if they clearly meet this requirement

What if I don’t have an idea for a project?

- You can investigate any method or biological system (e.g., biomolecule, molecular system, cellular process) you’re interested in
- You could pick something based on the optional readings on the course website—some of which are review papers—may give you ideas
- We will be providing more information soon on sample topics, and on software packages, datasets, and other resources that you may find helpful
- We’ve posted examples of projects from previous years on the course website

What if my project turns out to be too hard?

- You don’t need to “solve” the problem you set out to solve in order to get a good grade
- If things don’t work out, please explain in your report what you tried and what went wrong. Hypothesize about what the problem might have been and about how one might be able to overcome it in the future.

What if my project turns out to be too easy?

- If your initial plan requires very little effort, you can always find some next steps
  - For example, do some more sophisticated analysis of the results, or look at other biological systems