CS205L Project Guidelines

1 Important Dates

Each of the following due dates have a specific deadline of midnight (PST/PDT), i.e., **11:59pm**.

1. **Send us a proposal by February 9th (Saturday)**
   - Prior to starting work on the project, you should have found a TA willing to sponsor your project. This TA will be your point of contact for any project-related questions. (Come talk to us early on!)
   - You should submit the proposal to cs205l.staff@gmail.com after finding a sponsor TA. This is just for us to keep track of projects, and will not be graded. The proposal can be very short, but must contain the following:
     - Project title
     - Potential partners
     - Sponsor TA
     - Project description (at least 5 sentences)
     - At least 2 links to relevant online materials or course notes or textbook chapters
   - After the proposal is submitted, we will post the title of your project (anonymously) on the website, so other students can have an idea of what people are working on.

2. **Decide grading basis by March 7th (Thursday)**
   - You should email us at cs205l.staff@gmail.com to let us know whether you’d like the project to be worth 25% or 50% of your final grade. (See the next section of details on picking an option.)
   - For the 50% option, you may work with at most one partner.
   - For the 25% option, you must work alone, and choose to do either the take-home final or in-class final to make up the other 25% of your grade.
   - Each option will be evaluated and curved separately.
   - Note that if you start with a project partner and decide on dropping the project to 25%, you will need to split up and each produce a final project separately with significant differences.

3. **The project is due March 21st (Thursday)**
   - This is also the date for the final exam.
   - You must upload your writeup to Gradescope, and either
     - (a) include a link to the source code on GitHub/bitbucket/other hosting websites, or
     - (b) email us a zip file at cs205l.staff@gmail.com.
2 General Guidelines

2.1 Choosing a Topic

We're excited to see what people come up with, so do not hesitate to reach out with any project related to the course material that you find interesting! That being said, we're generally looking for projects that don't fall into the category of “feeding data into existing architectures, tweaking parameters, and reporting results.” Here's a non-exhaustive list of projects that might be interesting:

- Implementing different optimizers or numerical solvers, and either applying them to the numerical verification of existing theorems, or performing analysis of their stability/accuracy in network training.

- Formal reasoning about how various machine learning tricks for normalization/regularization improves numerical stability.

- Formal reasoning about the effects of dimensionality reduction within neural network architectures (ex. latent space clustering, hourglass structures, etc.)

- Identifying potential numerical issues in existing machine learning methods, and proposing potential solutions.

- Exploring, comparing, and evaluating different formulations of a real-world problem, and/or different data representations for the problem input/output.

2.2 Amount of work for 25% versus 50%

The main difference between the two are the project scope; when you come and talk to the TAs, mention which option you’re aiming for and we can let you know whether the project sounds too ambitious for a 25% project or not enough work for a 50% project.

Generally speaking, a 50% project should be as much work as a project for a standard project-based course (such as CS229/CS231N). If you’re concerned about whether your ongoing project is sufficient for a 50% project, check in with the TA prior to the grading basis deadline.
3 Communicating with TAs

3.1 Contact
Prior to finding a sponsor TA, please attend office hours or email the staff list or post on Piazza for project related questions. However, once you’ve decided on a project and found a TA, you can email the TA directly (our emails can be found on the course website.)

3.2 TA backgrounds and interests
This section is just to help you find an initial TA to approach; the TA may refer you to other TAs if they think someone else is better suited for sponsoring your project. In addition, it’s fine if our backgrounds don’t align with your project topics; to reiterate, we’re interested to see what you come up with.

• Jenny:
  – Background: physics, 3D graphics, vision, machine learning, optimization
  – Interests: anything that interests me

• Kevin
  – Background: Simulation, Applied Math, Physics, Computational Geometry
  – Interests: All of the above, though some specific examples of projects that I’ve done in the past (to give you an idea):
    * Numerical Integrators (Simulation, Applied Math, Physics)
    * 3D Sound (Simulation, Physics)
    * Various DDG (Discrete Differential Geometry)
    * Symbolic Differentiation (Applied Math)
    * Fluids (Simulation, Physics)

• Lucy:
  – Background: applied math, graphics, 3D vision, machine learning, numerical analysis, ode/pde
  – Interests: all of above

• Winnie:
  – Background: rendering, simulation, geometry, 3D vision, numerical analysis.
  – Interests: All of above, plus (but not limited to) deep clustering, differentiable renderers, 3D generative networks.