CS294-112 Deep Reinforcement Learning: Project Proposal Guidelines

1 Choosing a project

All projects should evaluate novel ideas that pertain to deep RL or its applications. The project must involve reinforcement learning algorithms, not just deep learning. Here are some examples of weak proposals and how to improve them.

1. Weak: re-implement a recent paper on deep RL.
   Strong: re-implement a recent paper and investigate an extension mentioned in the paper as potential future work.
2. Weak: run a deep RL algorithm out of the box on a new application.
   Strong: modify the algorithm to better suit the application.
3. Weak: sweep hyper-parameters, do architecture search of some algorithm.
   Strong: investigate the algorithm's robustness to more interesting tweaks (e.g. sparse rewards instead of dense), and pursue a solution.

It's a good idea to think early about the data (simulated or real) that you'll need to collect, and the computational resources you'll need. If you are conducting research, you are encouraged to propose a project relevant for your research. You are welcome to work on the project with students not enrolled in the class - in this case, we'd still like to know the size of the group.

2 Writing the proposal

The project proposal should be a **one page** single-spaced extended abstract motivating and outlining the project you plan to complete. You proposal should have the following structure (modeled after the structure used in academic grant applications):

1. **Objective** 1/4 page. Explain the objective of the project and why that objective is relevant and important.

2. **Related Work** 1/4 page. Briefly review the most relevant prior work, and highlight where those works fall short of meeting the objectives described above.
3. **Technical Outline** 1/2 page. Explain your approach at a high-level, making clear the novel technical contribution.

Submit one proposal per group. Submission instructions will be released closer to the due date.

3 Proposal Peer Feedback

The peer review process will model the process of how grant proposals are evaluated. Each proposal will be anonymized and assigned three peer reviewers. The peer reviews will evaluate novelty, the quality of the technical approach, and make suggestions about relevant prior work. Instructions and suggestions for writing a good review will be released closer to the reviews due date. After the peer review process, you will have an opportunity to revise your proposal given the comments from the reviews. The peer reviews will not affect your grade; they are meant to help you improve your project proposal.