Final Project

CS 6501 Reinforcement Learning (Spring 2024)*

1 Goals

- Give students the chance to apply what's learned in the class to problems they care about.
- Encourage students to delve into specific topics, discovering something not covered in the course.
- Promote collaborations and knowledge exchange between classmates from various backgrounds.

2 Types of Projects

The types of projects are widely open. Below are some, but not exhaustive, examples.

- **Application**: Pick a decision-making task. Try to use RL techniques (or combining other techniques) to complete the task.
- **Algorithm Design**: Identify weakness of existing algorithms in specific tasks. Try to improve existing algorithms or propose new algorithms.
- **Systematic Comparison**: Consider a specific decision-making task that can be dealt with by different methods. Provide a systematic comparison on the advantages/disadvantages/trade-offs among different methods.
- **Theoretical Understanding**: Identify phenomenons or algorithms that are never theoretically understood or analyzed in the literature. Try to use mathematical tools to justify or analyze them. Another possibility is to identify a unified framework to understand different algorithms.
- **Literature Survey**: Pick an area in decision making. Provide a detailed and clear overview and comparison of existing techniques. Identify important open problems in the area.

3 Grouping

1-3 students in a group.

*This final project specification is inspired by those of Shangtong Zhang's CS 6316 and Yen-Ling Kuo's CS 6501.

4 Breakdown

4.1 Proposal (5%) – due on February 16

- Team members
- Proposed problem and motivations
- Preliminary plans on the approach
- Related works to read
- Timeline plan

4.2 Milestone (5%)

TBD

4.3 Presentation (10%)

TBD

4.4 Final report (15%)

TBD

5 Late Policy

Every late day costs 20% deduction in the grade.