

Guideline for Course Project

The course project can be either individual or in groups of no more than three students in each group. The course project will be carried out in three phases:

Phase 1: Determining team members and the course project topic (by March 18)

The project topic is open. Please develop a project topic of your interest and form a team by March 18. As a starting point, you may identify an application area and then more detailed problems in the area.

As a starting point, refer <https://neptune.ai/blog/reinforcement-learning-applications>

Also, reinforcement learning for real life workshop:
<https://sites.google.com/view/RL4RealLife>

Phase 2: Literature survey (by March 25)

Collect and read papers relevant to the project topic identified in Phase 1.

Phase 3: Implementing Project and Writing Project Report (April 6, temporary deadline)

The tasks in this phase include: (1) Formulate the problem under study as a reinforcement learning problem, (2) Suggest possible RL algorithms to solve the problem, (3) (Optional) implement and test the proposed solution, or offer some theoretical analysis, (4) Discuss the cons and pros of your suggested solution compared with existing solutions on the problem. (5) Write project report (I strongly recommend that you start writing in Phase 2).

Final Project Report: The final project report should be 5-9 pages using the provided latex template (LatexTemplate.zip). I strongly recommend that you use overleaf (<https://www.overleaf.com/project>) for collaborative writing. You are not recommended to use MS words for professional scientific writing. A typical project report includes:

- **Title, Author(s).**
- **Abstract:** It should not be more than 300 words.
- **Introduction:** This section introduces your problem, why it's important or interesting, and the overall plan for approaching your problem.
- **Background/Related Work:** This section discusses relevant literature for your project.
- **Problem Formulation:** This section presents an RL formulation of the problem under study
- **Approach:** Algorithms that you plan to use or develop.
- **Theoretical results (Optional):** Include assumptions and proof sketches.
- **Experiment results (Optional):** Details on experiments and test results.
- **Discussion:** Briefly discuss the cons and pros of your suggested solution compared with existing solutions for the problem.
- **Conclusion:** What have you learned? Suggest future ideas.
- **References:** This is absolutely necessary. Include no less than 10 references.

Two sample course project reports from Stanford University are attached for your reference.