

# Machine Learning with Graphs: Projects

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A semester-long class project will be an important part of this course. The goal of the project is to allow students to have a hands-on (coding) experience applying the topics covered during the semester. Notice that you are not expected to develop a new solution or even solve a new problem as part of your project. However, if you feel inclined to do so, this is a great opportunity to challenge yourself and work on a problem you are passionate about.

Projects can be done individually or in groups with up to three students. In the case of groups, each student will list their specific contributions to the project in the progress and final reports.

The projects will be evaluated based on the rigor and quality of their proposal, reports, and presentation. Students are also encouraged to make their implementations publicly available. Notice that the project will make 40% of the final grade for this course. For material on writing and presentations, see the instructor's webpage<sup>1</sup>. Next, the deliverables for the project are summarized.

## Project Proposal (01/25)

A one-page description of the problem to be addressed in the project. Students are encouraged to select a problem of their interest as long as it matches the topic of the course. Notice that the solution to the problem does not need to be known at the time of the proposal submission.

A typical problem will be a supervised or unsupervised learning task using graphs. It should include at least one dataset and metrics for evaluation. In case needed, students can reach out to the instructor and teaching assistants for project ideas. Other online resources, such as *Kaggle*<sup>2</sup> and other data science challenges (e.g. KDD Cup) can also be used for project ideas.

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<sup>1</sup><https://cs.rice.edu/~al110/resources.html>

<sup>2</sup><https://www.kaggle.com>

## **Progress Reports (1st and 3rd Tuesday, Feb-April)**

Short (one paragraph) bi-weekly reports. In case nothing was done during the period, the submission of a report is optional. The goal of these reports is to incentivize students to work on the project throughout the semester. However, a good final report can supersede the progress reports in the final grade.

## **Project Presentation (04/19, 04/21)**

This will be a short description of the project to the entire class. The duration of the presentations will depend on the number of students who ultimately decide to take the course. Presentations are expected to be of high quality.

## **Final Report (04/30)**

The final report should summarize the entire project, including references, main challenges, results, and discussion. The length of final reports is limited to eight pages using the Neurips format<sup>3</sup>. Reports are expected to be clear, grammatically correct, well-organized, and technically sound.

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<sup>3</sup><https://nips.cc/Conferences/2020/PaperInformation/StyleFiles>