# 4033/5033: Final Project Requirement

1. Please submit a one-page project proposal by Oct 31, 11:59pm. (See template.)

2. Please submit a four-page final project report by Dec 16, 11:59pm. (See template.)

3. Both proposal and report must be written in Latex. It is encouraged that you learn to use Overleaf.

4. You can earn up to 5 bonus points by giving a 20-minute final project presentation to the class at the end of the semester (before final exam). If you choose to do so, please notify the instructor by Oct 31, 11:59pm.

5. All bonus points are directly added to the final score.

6. Each project should fall into one of the following five categories

**I. Application**
Propose to address a relatively new application problem using machine learning that requires *non-trivial* data preparation, e.g. using a data set from Kaggle is trivial but crawling data from Twitter is not.

**II. Implementation**
Implement from scratch a non-trivial learning algorithm published on a selective research venue or journal and obtain similar results. It is not allowed to build your code based on published codes.

**III. Improvement**
Propose your own idea to improve the accuracy of a learning algorithm that requires *non-trivial* modification or optimization of the objective function and obtain improved results over the original algorithm.

You will get 5 bonus points for improving a recently published algorithm by at least 3% (you can use any available code to obtain results of the published algorithm, if the results are valid). Based on the first bonus, you will get another 3 bonus points for improvement under a non-trivial learning scenario proposed by you.

**Iv. Ethics/Security**
Propose your own idea to address a privacy, fairness or security challenge in a machine learning algorithm that requires *non-trivial* modification or optimization of the original objective function or non-trivial design or optimization of an augmented objective function, and justify the effectiveness of the proposed idea, e.g. properly justify your modified algorithm is indeed more private than the original algorithm.

You will get 5 bonus points for addressing the challenge for a recently published algorithm (you can use any available code to obtain results of the published algorithm, if the results are valid).

**v. Special Topic**
Any special machine learning-related research-oriented project approved by the instructor.

7. You can work on the project using any programming language and libraries, as long as your project falls into one of the above five categories.

8. You can discuss ideas with each other but cannot collaborate on a project.

All subjective evaluations are done by the instructor. Confirm with him before proceeding, if you want.