

# Course Project Information

## Overview

The project for this course is designed to stimulate you to do a practical research problem. In a research project, the researchers first study the field and using the collected background knowledge and their own personal experiences and technical strengths, propose to solve a problem or come up with a better solution. They first need to show the **intellectual merit** of their proposal and the **broader impact** of their proposal. According to NSF (National Science Foundation), the intellectual merit and broader impact of a proposal are defined as follows:

**Intellectual Merit:** The intellectual Merit criterion encompasses the potential to advance knowledge

and

**Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

In other words, to prove the **intellectual merit** of your proposal, you need to **show why your idea is useful and interesting**. The **broader impact** criteria shows **why your novel idea is important, and who cares about it**. For instance, proposing to host cloud computing infrastructure in space orbit is certainly novel, and possibly useful, but it's broader impact is probably minimal.

Once you propose your idea, you can start your research project, working toward getting your idea implemented and ultimately evaluated.

**In this course's project, there are four milestones:**

**1. First milestone (due by the end of the 2<sup>nd</sup> week): Pairing up.**

On Piazza, you will pair up with two of your classmates to form a group. Effective team work is very important in both academia and industry, and we want you to work in teams of 3 on this project. We encourage you to get to know each other and pair up using the Piazza forums. By the deadline, any student who is not teamed up yet will be randomly assigned a teammate by the course staff.

**2. Second milestone (due by the end of Week 5): Project Proposal.**

This milestone is worth 20% of the project grade. As a group, you are to submit a 1-page proposal document where you show a real world problem that you want to solve. We strongly suggest you pick up a publicly hosted dataset (for instance: <http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/using-public-datasets.html>) and propose to do something interesting and useful with that dataset. Try

to show some intellectual merit and broader impact for your proposal as much as possible. Your proposal should also contain a short background section where you describe the state of the field for this problem. After you submit the proposals, the course staff and other students will give you feedback on your idea which you can take into consideration for the rest of the project. You will submit your proposal both on Coursera (for grading) and Piazza (for feedback from your fellow students).

### **3. Third milestone (due by the end of Week 11): Progress Report.**

This milestone is worth 30% of the project grade. By this point, you should have already started on your project and be well underway. For the milestone report, you will add 1 to 2 additional pages to your document. First, show what has changed in your proposal document (what you submitted for your second milestone) by graying out any old text. The new progress report pages should contain details on your progress, the challenges you have faced in the past 6 weeks working your project and how you solved them (or if you are stuck), and a prototype of your project. If you can, provide a time-table of your previous work and what is left to do for the final milestone. This report should also contain a “related works” section, where you do some background research to see what other solutions to similar problems are out there, whether in Academia (papers) or in industry, and provide citations in your paper. By this point, your report should start to look like an academic conference paper. You can use the templates here: [https://www.ieee.org/conferences\\_events/conferences/publishing/templates.html](https://www.ieee.org/conferences_events/conferences/publishing/templates.html). You will submit your progress report both to Coursera and Piazza as **pdf document**.

### **4. Final milestone (due by the end of Week 16): Final Report.**

This milestone is worth 50% of the project grade. In this final milestone, you will add another 2 to 3 pages to your project report. By this point, your project should be done and you should have results.

The final report should clearly show your project's status, including sections on describing the problem you tried to solve and why that problem is important to solve. This information will come from the work you did for milestone 2. You also need a section on the details of your work, which is an expanded version of your milestone 3 report. Finally, your report should contain an experimental results and evaluation section where you describe the results of your project, how effective it was, how much better it was than the existing solutions, new findings, and so on. Your paper should also contain an expanded section on related works. Do not forget to include an abstract and conclusions sections as well. Your final project report should look like a conference paper and should be in similar format. (See: [https://www.ieee.org/conferences\\_events/conferences/publishing/templates.html](https://www.ieee.org/conferences_events/conferences/publishing/templates.html)) You will submit your final report to both Coursera and Piazza as **pdf document**