

Algorithms and Society Seminar Course Project

Last Updated: May 31, 2017

As described in the syllabus, your course project is a critical means by which we will work towards the learning objectives of the course. This document outlines the deliverables associated with the project and serves as a reminder of some of the core goals of the project assignment. Further details about the project can be found in the introductory lecture (<http://www.psacomputing.org/algsoc/files/slides/introduction.pdf>).

Goals: Overall, your main goal should be (1) do something that simultaneously deeply engages with the course material and (2) will have value for you outside of the class as described in lecture. As this is a key part of the workload of the course, you should also be seeking to do a truly excellent job. In the broadest sense, a goal should be the really impress your colleagues and Prof. Hecht.

Tracks: Recall also that there will be two tracks for your projects: the “practice” track and the “research” track. The “practice” track will have more emphasis on implementation and competitive analysis. The “research” track will have more emphasis on novelty and robustness.

People: As discussed in the introductory lecture, the ideal team has 4-5 participants. I will make exceptions where necessary for twofer reasons.

Deliverables and Deadlines

- (1) Project Description (~2 pages) – May 2 – 20% of project grade
- (2) Project Update (~1 page) – end of Week 9 (May 27) – 15% of project grade
- (3) Project Report – due at time of presentation (June 7) – 50% of project grade
- (4) Project Presentation – June 7 – 15% of project grade (This will just be presentation quality; the content will be assessed in the report).

Project Proposal / Description

The goal of the project proposal is to argue for the fit of your project idea with the goals of the project stated above (e.g. course material engagement, twofer, general impressiveness). Prior to submitting the project proposal, you should feel free (encouraged!) to reach out to Prof. Hecht for guidance. Prof. Hecht may also iterate with you if on the project proposal if he does not feel your project will meet the goals of the project. Prof. Hecht will be holding special office hours after class on Wed. 4/28 to provide additional time for feedback.

In terms of specifics, your project proposal should be no more than two pages and should contain the following information:

- Logistics
 - The names of the people on your team

- The name of your project
- Your track: {research, practice}.
- Section #1: Motivation (roughly $\frac{3}{4}$ page):
 - For “practice” track: You should write a convincing argument as to why your proposed product/policy/idea is important in the broader industry landscape.
 - For “research” track: You should write a convincing argument for why your research questions or research challenge are novel relative to the academic literature and industry output.
 - For both tracks: This section should set up the problem/challenge that will be solved/addressed by the work done for the project. The specific nature of that work should be in the “Project Goal” section, described below.
- Section #2: Project Goal and Approach (roughly $\frac{3}{4}$ page):
 - A clear description of what you intend to accomplish to address the problem described in the “Motivation” section.
 - A clear-but-brief description of some of the main challenges associated with the achieving the goal as well as your proposed methods and approach (Note: this may change, but I want to see evidence that you have thought of a believably feasible means by which your project can be a success).
- Section #3: Work plan (Roughly $\frac{1}{4}$ page):
 - Describe what you intend to have accomplished by the Week 9 check-in date. *Note that you will be graded on how well you have achieved this goal.* Obviously, you will have to pivot some in terms of methods, etc., so try to keep this description high-level. Note: Updates to this will be permitted following discussion with me.

Project Status Update

This “assignment” should be very simple and should take no more than 30 minutes to 1 hour. You should describe, in less than one page, the status of your project relative to your Week 9 goals in your initial project proposal. This document should consist of the following:

Section 1: Your Stated Goals

Simply copy and paste the relevant section from your project proposal, unless there have been changes to this section that have been sanctioned by Prof. Hecht.

Section 2: Compare your Status to your Goals

If you have completed your goals, please briefly describe the current status of your project (and any additional work you have done). If you have not completed your goals, please give a justification as to why this is the case and describe your current status. If you have adapted your project such that some subset of the original Week 9 goals is no longer relevant, please explain why this is the case and describe the work you have done so far.

Presentations

The specifics of the presentations have been discussed in class, but to summarize here:

- Your presentations should be no longer than 8 minutes
 - Any group that goes over 8 minutes will be given a 10% on their presentation grade
 - You can guarantee that you will not go over the time limit by practicing!
- Your presentations should cover the same material as your final project, but reconfigured for the presentation medium
 - It is recommend but not required that your presentations follow the suggested outline of the project writeup as described below

Project Final Report

A substantial portion of your final project grade will come from the project final report. We have discussed some of the specifics of the report in class, but the formal specifics are detailed below:

Length:

5-7 pages (no specifics on spacing, margins, etc.; content is 1000x more important than format).

Due Date:

Midnight on the day of our finals period and absolutely no later (My grades are due 7/12, and I need time to read each of these deeply).

Relationship to Prior Work:

You *may* include text directly from your project proposals and updates, but only when relevant.

Content:

Your final report should *at least* contain the following sections:

- **Introduction + Motivation:** Using a very thorough review of the related literature and/or product space (different mixes of each for the research vs. practice track), strongly motivate the need for your project work.
 - This section should end with a formal description of the project goals (1-3 sentences or so).
 - An adequate motivation section will likely be no shorter than 1-1.5 pages. This should be a guide to the amount of content you need, not an incentive to be verbose with an insufficient amount of content.
- **Methods:** A relatively detailed description of the methods you took to accomplish your project goals.
 - A person reading this section should be able to roughly replicate your work.
 - You should convince Prof. Hecht why your project was sufficiently *challenging* to execute.

- Be sure to include challenges you faced that may not be apparent in the final product (e.g. limitations of existing software packages that got in your way, challenges associated with finding relevant literature, etc.).
- An adequate methods section is likely no shorter than 1.5 pages.
- **Results / Outcome:**
 - Describe in detail the outcome of your work. Include graphics when relevant.
 - This will likely be at least 1.5 pages.
 - I'm leaving the format of this section open as it will likely vary from group to group.
- **Future Work**
 - This section should describe logical next steps for your project and why each step is important.
 - This will likely be 0.5-1 pages
- **Limitations:**
 - This section should describe areas in which your project fell short of its goals. For research track folks, this will be a standard limitations section. For practice track folks, this section should describe ways in which the outcome of the project fell short of the project's potential.
 - This will likely be around 0.5 pages.
- **References:**
 - You will likely have a lot of these. Please use a references format that is standard to either computer science or the social sciences.
 - I recommend using Zotero or another references manager. Learning how to use these types of tools will save you lots of time in the long run.
 - This is NOT included in the page count.s

Note: If your report needs to be in a different structure for twofer reasons, that is fine. Please include a note at the top of the report describing why you have used a different structure and be sure to cover at least the above material.

Hypothesized FAQ

Q: I want to do {enormous project that cannot be possibly completed before the end of the quarter}. Can my group do this?

A: No, scope it down! Remember, as discussed in class, strong projects will have some degree of implementation, but a reasonable project might be a highly detailed and well-motivated plan for a product or research plan.

Q: Can I work alone?

A: See "People" above.

Q: I'm feeling nervous about doing something ambitious!

A: Don't! Take risks. The ideal project is feasible in the timeframe but difficult.

Q: To what music should I listen while working on my project?

A: Bruce Springsteen, clearly.

