



CS640 Fall 2012

Research Memo: Writing a Proposal

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Research is speculative -- you don't know what you'll have in the end until you get there... and sometimes not even then. The purpose of the proposal in CS640 (and to a large extent for other proposals) is to 1) indicate where you'd like to be at the end (e.g., results, conclusions, contributions) and 2) describe the route you think you might travel to get there (e.g., activities, milestones).

The form of the proposal varies depending on who needs to be convinced about the merit of your destination and how much it will cost to get there. Among the most informal is the class project proposal -- usually about one page in length -- which sketches out a well constrained idea. Only two people need to be convinced about its merit (you and the instructor), and the cost of the journey is relatively low (a few weeks of part time work or one week of more than full time). Among the most formal are project proposals to funding agencies -- usually 40-60 pages in a stylized format and organization specified by the people who give out the money¹. These proposals must convince lots of people from varied backgrounds and may cost lots of money and several years of effort by many people. They also require from a few weeks of full time effort to months of effort to produce.

Your proposal for CS640 is in between, but tending toward the more informal end. As you can see from the grading form, I, as grader, am trying to evaluate the merits of the project, primarily motivation, suitability to the class, quality of the goal and feasibility.

Format The document should be 7-12 pages, 1.5 line spacing, reasonable font size (10-12pt) and 1 inch margins all around. I need space to write comments; this format works well for that.

You should include a cover page with your name, the date, and a title. Titles, in general, should be short and use descriptive keywords. Your paper should end with a bibliography. Use any citation style you like, but use one of the approved ones (i.e., include as many of the fields as bibtex suggests as possible).

Content As suggested above, the proposal must describe what you have done so far (any pilot experiments or other research on which it is based), what you'd like to accomplish by the end of next semester and how you intend to do it. On the first, you should articulate what problem or questions you will address in the project and why they are worth pursuing. You should cite and review other work that has addressed the same or similar problems/questions. You should incorporate your mini-research exam into the

¹ Should you wish to see an example, I can show you several.

background for the project and add to it other papers you may have read in starting this project. The research review helps set the context for the project and shows that you know what you are building on. I expect to see a minimum of five relevant papers that you discuss; you should contrast your proposed work with what is in the relevant papers. You should also describe a) what you have done so far (if you have some preliminary or foundational work that you have already done) and b) what resources you may be obtaining and using (e.g., publically available software or datasets)

In the second part, you should state what you hope to show by the end of next semester: your starting point, your goals, your hypotheses, etc. Your proposal should justify 1) why this problem is worthwhile and appropriate for the class, 2) what about it has not yet been solved, and 3) how you will demonstrate/evaluate your contribution. Your proposal should describe how your proposed research would be a contribution; you can compare it to existing research, pointing out how you will fix gaps or flaws from earlier work. On point 3, ultimately, you *may* find out that whatever you chose to do wasn't a good idea after all; it happens in research, but you at least need to assure me that you'll know at the end whether or not it was.

For the third part, you should develop a short plan of work. The proposal should include a list of tasks that you think you will need to accomplish and some indication of how much coding, data collection and evaluation needs to be done.

Make clear what are *your* ideas. If you plan to use code from others (which is, by the way, a great strategy for getting more accomplished), state it. If you plan to compare your results to others, state it. If this is dovetailing to another project (e.g., your Master's thesis, research assistant work, etc.), state it.

Suggested Organization The following is not required, but clarifies what I expect to read in any proposal.

1. **Cover page:** title, name
2. **Statement of Purpose:** What is the problem? What do you intend to show? What questions do you hope to answer? Why is this an important problem?
3. **Background:** Who has worked on this before? What did they learn that is useful? Can you exploit any prior code or results? On what literature will you be building?
4. **Solution:** What will you do to address the problem? What have you done so far? How will you constrain the problem or solution so that you can get it done in the time available? Why is your solution a good idea?
5. **Demonstration/Evaluation Plan:** How will you demonstrate your statement of purpose? What kinds of experiments might you run? How much generality would you like to claim?
6. **Plan of Work:** What are the tasks required to implement and test your solution?
7. **Bibliography**

CS640 Fall 2012: Written Proposal Feedback

Author:

Grade:

I. Written Presentation

A. Organization [/ 5]

B. Grammar, readability. [/ 10]

II. Proposal Content

A. Description of problem to be addressed. [/ 10]

B. Motivation (why this problem and approach). [/ 10]

C. Appropriate citations, acknowledgment of use of existing code or ideas, and background material. [/ 15]

D. Significance/level of difficulty. [/ 10]

E. Proposed approach to solution of problem: Is it feasible? Worthwhile? Are there preliminary results? [/ 20]

F. Is contribution likely to be valuable? How will the project's contribution be evaluated? [/ 10]

G. Is the proposed timeline reasonable and well thought out? [/ 10]

Other comments:

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CS640 Poster Feedback

Name:

Overall Score

Problems

Strengths

Suggestions for Improvement