CSC 497 Syllabus

Spring 2009

Fridays 3:05-4:45pm

website: cs.union.edu/~striegnk/courses/csc497

1 Goals:

- Learn about research in CS.
- Develop skill in critical reading in CS.
- Develop skill in scientific writing in CS.
- Develop skill in presenting scholarly work, and in participating in presentations as an audience member.
- Find a research question for your senior project.

2 Ground Rules

Attendance, participation and preparation: Classes will involve a lot of discussion. It is thus important that you attend all classes, come prepared, and participate. After the first absence, your final grade will be reduced by 1/3 for each further unexcused absence (e.g., A- to B+, or B to B-). If you have a convincing reason why you have to miss a class, come to talk to me well in advance so that we can discuss what you are going to miss and how you can make up for it.

Weekly writing: There will be weekly writing assignments of varying length. The reason for this is that writing helps thinking. Nobody develops research questions overnight. Research questions are the product of exploring an area in different directions, asking questions, looking at them from different angles, revising them. Writing during this process really helps to avoid going around in circles, to focus ideas, and to learn how to formulate your question clearly.

Late work and make ups will not be allowed, since the assignments in this class build on each other and the schedule is relatively tight.

Accommodations: If you need any special arrangements for any reason, please come and talk to me at the beginning of the term so that we can find a solution that works for you.

3 Evaluation

- class participation (10%)
- background paper (15%)
- final paper (25%)
- presentations (15%)
- weekly writing assignment (other than background paper and final paper) (15%)
- peer-review and self-review (10%)
- seminar participation (10%)

4 Tentative Schedule:

Week 1: Intro. Self-portrait of a CS researcher.

Week 2: Research areas, questions, methodologies, and evaluation strategies in CS.

Week 3: What should a senior project proposal look like? How to define a research question.

Week 4: What makes a good paper?

Week 5: What makes a good talk?

Week 6: Background paper presentations

Week 7: How to plan and carry out a research project

Week 8: TBD (one possibility: ethical issues in CS research; or time management)

Week 9: practice presentations

Week 10: final presentations to the department

5 Assignments

The following is a week-by-week overview of the main assignments for this class. I may give you additional information on some of the assignments as we go along. Regularly check the Blackboard page for this.

Assignment Week 1:

1) Take some time to think about the following questions: What are some of your (childhood) dreams? Or what are some things that you are currently very interested in, issues you are invested in, activities you (would) like to do, areas you would like to make a contribution to? (It doesn't matter if there is no immediately obvious connection to computer science.) Write half a page

answering this question and upload the document to your blackboard space.

Why am I asking these questions? I am not trying to say that your senior project will fulfill a childhood dream of yours (it may ... who knows), but I do think that you should keep your dreams and interests in mind when looking for a topic for your senior project. I would like for all of you to find a research question that is meaningful to you. It will make the senior project more fun and, most likely, more successful.

2) Look at web sites of computer science departments at universities and compile a list of CS research areas. (Upload to Blackboard.)

3) Pick three research projects that you come across which you find interesting. The projects have to be from different research areas. What are the research questions asked in each project? Why do you find the projects interesting? Write half a page about each research project, outlining what it is about, what the research question is, and why you find it interesting. (Upload to Blackboard.)

Assignments Week 2:

Pick one (sub-) area of research that you find interesting and that you would like to do your senior project in.

1. Write half a page about why you picked that research area. Upload the document.

2. Create a bibliography of papers to read in order to get a background in that area. This bibliography will be with you for the rest of your project. It will continue to grow as you are finding out more about the area and as your are narrowing down your research project. Your goal for this week is to find (at least) 5 entries. If you find more, that's good but remember that you will have to read all of them. So you should be somewhat selective in what you put on your bibliography. In this first stage, you want things that give you an overview.

   Your bibliography should be an annotated bibliography. That means, in addition to the bibliographical entry, you need to have a few keywords or a sentence or two that remind you of why this paper is important to you.

   To find the papers for your bibliography, use the Internet, the library (and its electronic databases), and go to talk to CS faculty (or faculty from other departments if your project is interdisciplinary.) who know the area that you are interested in. (THIS IS A REQUIREMENT. You have to go and talk to at least one faculty member. Do NOT wait until the last day to do this. DO it on MONDAY.)

   Decide on an order in which you are going to read the papers in your bibliography. Explain (in writing) why you picked that order.

Upload your bibliography.

Assignment Week 3:

1) Read (at least) 3 papers from your bibliography. Write half a page in response to each of them: What is the research question in the paper? Why is the paper interesting to you; or why is it not interesting? Evaluate the results. (See above for questions you may ask.)
2) Revise your bibliography. Add new, interesting looking papers that you found, e.g., because they were cited in one of the papers you have read. Revise your order in which you are going to read the papers in your bibliography. Explain in writing why you decided on that order.

Assignment Week 4:

Read (at least) 3 more papers from your bibliography and do the same as last week.

Assignment Week 5:

1) Write a background paper on the research area or sub-area you have chosen. Referencing papers from your bibliography (you are, of course, still allowed to add to your bibliography), this paper should describe the main research questions being asked in that area, the methodologies used to answer them, and the methods used to evaluate the answers. The paper should ***not*** be just a list of paragraphs with each paragraph describing one paper. You should present how the papers relate to each other and to the overarching questions being asked in your research area. There should be a connecting storyline running through your paper.
2) Prepare a 10 minute presentation on your research area.

Assignment Week 6:

1) You will get the background papers of two other students. Review these papers using the rubric we developed in class. Give as much feedback as possible. Be as constructive as possible. This is going to help them write a good final paper.
2) AFTER having reviewed the other two papers, read your paper again and review it in the same way. Try to read your paper as if it was somebody else's paper.
3) Now that you have an overview of the kinds of research questions that other people ask in the research area you have chosen, you need to find your own. Come up with as many possible research questions as you can. In the end you

will have to narrow it down to one (or maybe two). But you want to start with a large collection so that you have something to work with and choose from.

4) Now go through each research question, and ask yourself: Would I be interested in doing this? Is this a good research question? If not, why not? Don't eliminate any questions because you think they are bad research questions. Maybe they can be turned into good ones. But to be able to do this, you first need to reflect on what makes them a good or bad question.

Assignment Week 7:

1) Pick the research question that you find most interesting and seems most viable. Go to faculty members who know the area that you are interested in and pitch the research question to them. Discuss why it is a good question, what is problematic about it, and how it could be changed to make it into a good question. Then revise your question in light of that discussion. (Again, do not leave this until the last day. Do it on Monday.)
2) Write the first part of your final paper. This means: an introduction introducing and motivating your research question and the background sections where you explain how your question relates to earlier work in the research area. You will be able to (and in fact you should) use material from your background paper. When doing so, revise it based on the comments you received from the other students and me.
3) Write down (separately) alternative methods that you could use to answer your question. Explain the pros and cons of each method.

Assignment Week 8:

1) You will get the draft papers of two other students. Review these papers using the rubric we developed in class. Give as much feedback as possible. Be as constructive as possible. This is going to help them write a good final paper.
2) AFTER having reviewed the other two papers, read your paper again and review it in the same way. Try to read your paper as if it was somebody else's paper.
3) "Storyboard" your project.
4) Prepare a 10 minute presentation on your project.

Assignment Week 9:

1) Revise the first part of your final paper based on the comments you received.
2) Write the second part of the paper, which should describe what methods you

are going to use to answer your research question and how you are going to evaluate your project.

3) Revise your presentation.

Assignment Week 10:

1. Finish your final paper. (Due at the end of finals.)