Department of Computer Science – University of Saskatchewan

CMPT 880/890 – RESEARCH METHODS IN COMPUTER SCIENCE

Course Outline – 2014/2014 Terms 1 and 2

1. COURSE DESCRIPTION

This course introduces students to the nature and demands of science and research, provides a framework for productive writing, and gives opportunities to practice researching, writing, and presenting. From the catalogue:

CMPT 880: An introduction to research methods and research topics in computer science. Selected topics are researched under the direct supervision of faculty members, and reports on the outcome of this research are given in both oral presentations and in written papers. Required of all students in the M.Sc. program.

CMPT 890: An introduction to research methods and research topics in computer science. Selected topics are researched under the direct supervision of faculty members, and reports on the outcome of this research are given in both oral presentations and in written papers. Topics are more difficult than in CMPT 880 and more in-depth research is expected. Required of all students in the Ph.D. program.

2. INSTRUCTOR

- Prof. Carl Gutwin
- 377.2 Thorvaldson
- Office hours by appointment (send email)
- gutwin@cs.usask.ca

3. TEXTBOOK

Wayne C. Booth, Gregory G. Colomb, and Joseph M. Williams. The Craft of Research, 3rd edition. University of Chicago Press, 2003. (Available at the U of S bookstore)

4. LECTURE TOPICS

The following topics will be covered:

- Science and Computer Science
- The scientific method
- Faculty research areas
- Choosing a research topic
- Types of research in CS
- The "five questions" model of research
- Finding background literature
- The literature review
- Research ethics
- Structuring arguments
- Evaluation methods
- Giving presentations
- Writing research papers
- Peer review in CS

5. GRADING

- Class participation: 10%
- Paper summary: 5%
- Research proposal: 25%
- Presentation of research proposal: 5%
- Final research paper: 40%
- Presentation at graduate symposium: 15%

6. Assignments

You will complete several assignments in the course, all oriented towards a research project that will be presented in April at the graduate symposium. The assignments are:

- *A list of papers in your area*. With your supervisor, you will identify and read 5-10 papers that will give you background in your area of study, and provide starting points for thinking about research topics.
- *A summary of one paper*. From the list, choose one paper and write a summary of the paper. You will hand in the written summary, and present your summary to the class.
- *A list of three potential research topics*. With your supervisor, you will identify up to three potential research topics for exploration. You will do initial background work for each topic, and select one as your 880 topic.
- *A summary of your chosen topic*. You will produce a short summary of your topic, following the "five questions" format, and present the topic in class.
- *A list of papers for the literature review*. You will produce a list of 20-30 papers related to your chosen topic, and write a literature review to be included in your research proposal.
- *Research proposal*. You will write a research proposal for your chosen topic, with sections Introduction, Related Work (i.e., your literature review), The Idea (where you will talk about your solution to the problem), Research Plan, Evaluation Plan, Contributions, and References. The proposal will be in ACM conference format (http://www.acm.org/sigs/publications/proceedings-templates), and will be the starting point for the research paper you write in T2.
- *Presentation of research proposal*. You will present your research proposal to the class.

7. Department Policy on Academic Honesty

Students are expected to be academically honest in all of their scholarly work, including course assignments and examinations. Academic honesty is defined and described in the Department of Computer Science Statement on Academic Honesty (http://www.cs.usask.ca/undergrad/honesty.php) and the University of Saskatchewan Website (http://www.usask.ca/honesty).

8. Important Dates

- Friday September 19: list of 5-10 papers from supervisor
- Friday October 3: summary of (up to) three potential research topics for the proposal
- Friday October 10: identification of one paper (from the supervisor's list) for summary and presentation
- Friday October 17: revised summary of one chosen research topic
- Friday October 24: paper summary
- October 22 and 24: presentations of paper summaries
- Friday October 31: list of papers and high-level outline for literature review
- Friday November 7: outline of research proposal with introduction completed
- November 19 and 21: presentation of proposal outlines
- Friday November 21: literature review section of research proposal completed
- Friday November 28: evaluation section of research proposal completed
- Friday December 5: full research proposal completed
- T2 2015: no lectures; meet regularly with your supervisor to carry out your project
- February 13, 2015: mid-term progress report on research project
- April 2015 (date TBA): research paper handed in
- April 2015 (date TBA): research presentation at graduate symposium