Research Project:
CMSC-491/691 Electronic Voting Systems

Spring 2006, Alan Sherman, UMBC

Overview

Each student must complete a research project on a focused topic related to this course. The project must aim to accomplish new, significant results (survey papers are not acceptable). Each student must communicate his or her findings in an oral presentation to the class and in a written report in the format of a computer science technical report (about 10–20 pages). Every aspect of the project (including proposals, reviews, reports, and presentations) is intended to match the process that professional computer science researchers follow in carrying out original research.

Deliverables and their due Dates

March 15	Pre-proposal (see separate handout)
March 29	Proposal
April 3	Evaluation of a peer proposal
April 10	Progress report
April 24	Complete draft report and draft presentation for review
May 1	Referee report of a peer draft project and presentation
May 3	Oral presentations begin
May 8	Final report, and confidential evaluations of group members (if any)

Note: For each deliverable, bring two hard copies to class, and email an electronic version to dralansherman@starpower.net with 491 or 691 in the subject line. One copy is for the instructor; the other is for the reviewer. Always hand in deliverables on one-sided 8.5in □ 11in one-sided paper, with one staple in the upper-left corner, without any covers or folders.

Group Work

Students are allowed and encouraged (but not required) to work in small groups (of up to at most three members). Typically, but not necessarily, everyone in a group will receive the same grade.

Grading Policy

The project will count for 60% of the semester grade. Each report will be evaluated on the following three criteria: appropriateness for assignment (have you satisfied the specifications?), scientific merit (correctness, significance, novelty, non-triviality, scientific completeness), and effective presentation (clarity, organization, English usage, appropriate style). Each project will be evaluated on the basis of the final report (70%), oral presentation (20%), and quality of the group's referee report (10%).

Confidential Evaluation of Group Members (about 1 page or less)

Only for groups with more than one member, each member must evaluate the performance and contribution of each group member (including yourself) to the project. What did each person do and how well did they do their task? How well did the group function as a team? This evaluation will be read only by the instructor.

Proposal

The proposal must clearly explain what you are doing, why you are doing it, what is new about your project, and what is the significance of your project. The proposal should include a critical review of previous related work, specific aims, a plan of attack (how you plan to accomplish your aims), and a bibliography. It should also include a realistic schedule, budget, a list of deliverables, and a discussion of any foreseeable difficulties and how you plan to overcome them. The proposal should follow the generally-accepted guidelines for computer science research proposals—for example, as described by the National Science Foundation on their web pages. I recommend that you evolve your proposal into your final report, reusing as much text as possible.

The proposal must be organized as follows:

(a) Project Summary Page (one page)
Include the following summary information:
1. Informative project title. (do not title your project "CMSC-691 Project.")
2. Date.
3. Investigator names, affiliations, and email addresses
4. Short phrase describing the general area within cryptology of your project.
5. Keywords.
6. Brief 1-3 sentence project description. Distill your proposal to one focused, well-defined question.
7. Assignment of responsibilities to group members (if group work).
8. Total budget
9. Brief list of deliverable

(b) Executive Summary (one page)
The executive summary is like an abstract; it is a substitute for the entire proposal. Repeat the title, date, author names and affiliations, and project keywords on the executive summary page

(c) Motivation
What are you doing and why? Why is your work significant, both within your field, and to society at large? What is challenging about your proposed work?

(d) Previous Work
Identify and critically comment on selected relevant previous work. How is your project different and better than this previous work? Do not simply list previous work.

(e) Specific Aims
Concretely list the specific problems you propose to solve.

(f) Plan
How will you accomplish your specific aims?

(g) Deliverables
What is the output of your project? *E.g.*, project report, PowerPoint slides, presentation, sourcecode.

(h) Issues
What difficulties do you foresee, and how do you plan to overcome them?

(i) Bibliography
List (in proper bibliographic form) all works you need to complete your project.

(j) Biographical sketches of the investigator(s)

(k) Schedule
List a timeline of major steps toward completing your project.

(l) Budget
What resources (including your own time) do you need to complete the project? Using a spreadsheet (*e.g.*, Excel), summarize in one simple page your direct, indirect, and total costs. As your indirect costs, include a 47% overhead for UMBC on all direct costs. (*Indirect cost* is UMBC's overhead. *Direct costs* are everything else.)

(m) Appendix A: Research Conference

Name a refereed research conference that best matches your project, and identify a recent paper from this conference that best matches your project (attach a copy of the paper).

Evaluation of Proposal

Each group will evaluate one other group's proposal. The format of the evaluation should be an NSF-style review of about 1–3 pages. The evaluation must comment on each of the following elements:

(a) Intrinsic scientific merit of proposed research in terms of likely significance, novelty, and nontriviality.
(b) Likely broader impact of project on society.
(c) Qualifications of investigator to carry out the proposed research successfully.
(d) Reasonableness of the proposed budget (does the budget accurately reflect the necessary costs to complete the work?).
(e) Appropriateness and completeness of proposal to this assignment.
(f) Detailed technical comments on proposed problem, awareness of previous work, and plan of attack.
(g) Overall evaluation, recommendation, and suggestions.

Progress Report

The progress report should explain what you have accomplished and what remains to be done. Discuss any difficulties and how you plan to overcome them. Any significant changes from the proposal should be noted. The progress report must include a draft outline for the written report, an updated bibliography, and a revised schedule.

Referee Report

Each group will evaluate one other group's draft report and draft presentation (*e.g.* set of PowerPoint slides) in time to make changes for the final report. Each review must include the following elements:
(a) A referee's report (about 2–3 pages) commenting on the report's appropriateness, scientific merit, effective communication, and overall evaluation and recommendation. The format and style of the referee's report should be exactly like those for refereed computer science journals (*e.g.* organize the referee report in five sections: summary of results, appropriateness of project to assignment, scientific merit, effective communication, and overall evaluation).
(b) Annotated copy of draft report. Many detailed comments are most efficiently communicated via an annotated copy.
(c) Annotated copy of draft presentation.

Final Report

Be sure that your document is complete, as described in my essay, ``Some advice on writing a technical report,'' http://www.cs.umbc.edu/~sherman/Courses/documents/TR_how_to.html
The organization of the report should be some variation of the standard outline for all scientific work: motivation, previous work, methods, results, discussion, open problems and conclusions. Include printouts of any source code as a separate appendix. You may optionally include a response to any referee reports.

Please hand in these items on 8 ½ x 11 inch white paper, one-sided, with one staple per item in the upper-left corner. Put one large binder clip around package. Write your name(s) on each item. Do not use folders or covers. Keep a copy of everything your hand in for your records, in case something gets lost.

Common errors from previous years include: (a) failure to explain precisely what problem was solved and why, (b) failure to identify clearly what is new, significant, and nontrivial about the work, (c) previous work is simply listed but not commented upon critically, (d) axes of graphs are do not clearly identify type, units, and scale, (e) observed standard deviations are not listed when reporting average values from experimental work, (f) document is missing one or more required parts, such as abstract and keywords, and (g) abstract is not informative. The abstract should explicitly state what you accomplished and should serve as a substitute for the entire paper; it should not be confused with the introduction which motivates the paper.