

EE381v Project

Proposal Due: Oct 12

Final Report Due: Dec 8, 5pm

The project, valued at 35% of your grade, is the most important aspect of this course. The goal is to begin an original work that will ultimately result in a conference (or even journal!) paper. There is a strong precedent for this from my advanced courses in 2002, 2003, and 2004. In several cases, the project from this course wound up forming the basis of M.S. and Ph.D. theses.

You may collaborate with one other student on the project but this will of course increase my expectations for its scope and quality. There is absolutely nothing wrong with using this course project to further your own research goals, in fact, that is expected so an optimistic view is that the project results in credit for doing research while still taking a class. You cannot however turn in the same course project for two different classes, unless having permission from both instructors ahead of time. Otherwise this is a serious academic violation.

A project proposal is due at approximately the midpoint of the class. This should consist of:

1. A tentative title for your project
2. A clear and brief description of what you intend to investigate (1 page)
3. A detailed literature review in the proposed area that identifies and discusses all the key prior work and references it in proper IEEE reference style, ideally describing how your intended contribution fits in (at least 2 pages)
4. A list of what you hope to discover or accomplish with the project. (1/2 – 1 page)

Picking an appropriate problem is one of the more challenging aspects of research. It is suggested that you browse current literature such as *IEEE Communications Magazine*, *IEEE Wireless Communications Magazine*, and recent conference proceedings such as the *IEEE International Conference on Communications*, *IEEE Intl. Symposium on Information Theory*, and *IEEE Globecom*. These will give you ideas about the areas that are subjects of active research. Assuming this is your first substantial research project in the area of wireless communications, your project should be related to other topics of contemporary interest. You are encouraged to have informal discussions with me early in the class for advice and direction on finding a topic. Do *not* leave this until a week before the proposal deadline. Background work, brainstorming, and reading on your project topic should start from the first week of class.

The proposal should lay out aggressive goals, and state which ones will definitely be accomplished, which ones may be accomplished if things go well, and then what will be left for future research after the course ends. The nature of research is such that you can't always predict what will be the outcome of your investigations, but it's always good to specify your goals as clearly as possible. Deviating from these is fine as long as the final report makes clear why you did so.

The project report should be roughly in the format of an IEEE conference or journal paper. There should be an abstract, conclusions, and thorough references, along with supporting sections clearly describing your methodology, analysis, simulations, and results. The paper should be double-spaced and laser-printed with adequate supporting illustrations (block diagrams and plots) and equations (describing your system model and analytical results). A short and concise report (about 10 pages double spaced, plus figures) with interesting results highlighted and demonstrated is what is expected.

Project Grading Breakdown

Proposal (15 points):

- Clarity of objectives, ambitious but achievable objectives
- Relevance of proposed research, motivation of problem
- Appropriateness and completeness of cited literature

Final Report (85 points):

- Originality (15 pts):
Is this new work, how creative is the idea, how creative is the solution, how general is the solution?
- Organization (10 pts):
All required sections present, good flow of explanation, proper use of figures, easy to follow development of your ideas, easy to identify your contributions?
- Writing style, grammar, readability (20 pts):
Proofread, proofread, proofread, then have your colleagues proofread (preferably one with good English writing skills), then proofread again. Additionally, the introduction and abstract should be well-written and motivating – the goal of these sections is to frame and motivate the work and convince the reader that the research is valuable and worth the effort to read. (I believe that most papers are accepted or rejected based on a reading of the abstract, introduction, conclusions, and references).
- Technical Content and Execution (25 pts):
Are the technical contents strong and thorough? How well do you deliver on your proposal, how well do you accomplish the claims made in the abstract, how clear is your analysis, does this work thoroughly cover the proposed area?
- References (10 pts):
Proper IEEE reference style, all relevant research cited, no frivolous citations, good discussion of previous state-of-the-art?
- Hardcopy and softcopy (PDF) by e-mail (5 pts)