1. **Project Summary (CIS 640: we will replace this with an abstract)**

   NSF grant proposals require a one page summary of the research. For CIS 640, this page will include title of project, names of co-authors and an abstract.

2. **Project Description (NSF limit is 15 pages. CIS 640 limit is 6 pages)**

   “The Project Description should provide a clear statement of the work to be undertaken and must include: objectives for the period of the proposed work and expected significance; relation to longer-term goals of the PI's project; and relation to the present state of knowledge in the field, to work in progress by the PI under other support and to work in progress elsewhere.

   The Project Description should outline the general plan of work, including the broad design of activities to be undertaken, and, where appropriate, provide a clear description of experimental methods and procedures. Proposers should address what they want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified. These issues apply to both the technical aspects of the proposal and the way in which the project may make broader contributions.” -- NSF Grant Proposal Guide

   The CIS 640 project description has a 6 page limit. (NSF limit is 15 pages; your proposal is automatically rejected by NSF if over this page limit!)

2.1 **Objectives and Expected Significance** (Address issues that make sense for this CIS 640 project. You can ‘fake it’ within reason.)

   What are the main scientific challenges? Emphasize what the new ideas are. Briefly describe the project's major goals and their impact on the state of the art.

   Clearly state the question you will address:

   - Why is it important? What makes something important varies with the field. For some fields, the intellectual challenge should be emphasized, for others the practical applications should be emphasized.
   - Why is it an interesting/difficult/challenging question? It must be neither trivial nor impossible.

2.2 **Background and Technical Need** (Describe current approaches to non-secure and secure airplane boarding. Since we have limited time, read the Steffen article and you can “fake it” for other studies.)
What long-term technical goals will this work serve?

- What are the main barriers to progress? What has led to success so far and what limitations remain? What is the missing knowledge?
- What aspects of the current state-of-the-art lead to this proposal? Why are these the right issues to be addressing now?
- What lessons from past and current research motivate your work. What value will your research provide? What is it that your results will make possible?
- What is the relation to the present state of knowledge, to current work here & elsewhere? Cite those whose work you’re building on (and whom you would like to have review your proposal). Don’t insult anyone. For example, don’t say their work is “inadequate;” rather, identify the issues they didn’t address.

2.3 Research Description

Broad technical description of research plan: activities, methods, data, and theory.

Write to convince the best person in your field that your idea deserves funding. Simultaneously, you must convince someone who is very smart but has no background in your sub-area. The goal of your proposal is to persuade the reviewers that your ideas are so important that they will take money out of the taxpayers’ pockets and hand it to you. This is the part that counts. WHAT will you do? Why is your strategy an appropriate one to pursue? What is the key idea that makes it possible for to answer this question? HOW will you achieve your goals? Concisely and coherently, this section should complete the arguments developed earlier and present your initial pass on how to solve the problems posed. Avoid repetitions and digressions.

2.4 Education and Human Resources  (CIS 640: Skip this section)

What are your potential contributions to developing human resources in science & engineering at postdoc, graduate, and undergrad levels?

2.5 Plan of work

Discuss expected results and your plan for evaluating the results. How will you measure progress? Include a discussion of milestones and expected dates of completion. (Six months is the about the smallest time chunk you should include in an NSF proposal.) You are not committed to following this plan - but you must present a FEASIBLE plan to convince the reviewers that you know how to go about getting research results. Think of the plan as presenting a possible path from where you are now to where you want to be at the end of the research.