Proposal Writing

ECE 2883

Design Proposal Assignment

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Why Do a Design Proposal?

- Open-ended design problems are a key part of your education, and a proposal is “Step 1” of such a problem
  - You will be working on an extremely open-ended problem this semester
- A proposal forces you to consider not only what you will do, but how you will do it
- In this case, you might not know exactly how you will do it
  - This proposal will “help us help you”

Think About the Big Picture

- What have we asked you to do for the project?
  - What are the technical requirements?
  - What are the concept recommendations?
- From the basic idea, what smaller pieces are necessary?
  - Remember top-down design.
  - Do you need any additional hardware?

Organizing Your Proposal

- All proposals will include the following sections/headings:
  - Executive Summary (ES)
  - Introduction
  - Technical Approach
  - Management Plan
- Additionally, some sections will contain relevant, descriptive subheadings
  - Subheadings will be determined by each team
  - Your goal is to make information easy to find

Executive Summary

- The entire proposal condensed into one paragraph – write it last!
- Allows an “executive” to quickly judge whether or not your proposal is worth consideration
- Briefly define the problem being addressed
- Briefly discuss the approach that will be used to solve the problem *and* explain the strength of the approach
- Consider it a separate document
  - Don’t refer to the rest of the document

What Makes a Good ES

- If it's not in the ES, the reader will assume it's not in the paper
  - Everything that you think will increase your chances of getting your proposal read should be in the ES
- Save intricate technical details for the body
  - Think "big picture"
  - If the reader wants more specific information, they know they can find it in the rest of the document
- Feasibility is just as important as technical merit
  - Realistic technical goals, AND realistic scheduling

Introduction

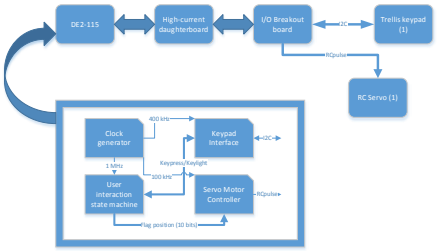
- Briefly describe the design problem
  - Show that you understand what you are doing
- Briefly describe your team's solution to the problem
  - Enough that the document headings make sense
- Avoid too much detail that the reader should already know
  - Not important: what an FPGA is
  - Important: what you do with the FPGA

Technical Approach

- This section contains all the “what” and “how” of your design
  - By far the largest section.
  - It should be as technically detailed as possible.
- Explain your team’s goals and the methods of fulfilling them.
  - Do not just state your intentions. How will you achieve them? Why that way? Do you know it’s possible?
- You should “sell” your idea as being interesting and feasible
- Use descriptive subheadings

Technical Approach Topics

- Explain the intended design and operation of your hardware / software / algorithm / strategy
  - Again, focusing on what YOU are doing.
  - Include block diagrams to show your intended hardware connections.
    - The top-level hardware
    - The internal FPGA



- Describe how you plan to use the DE2 and provided hardware
  - What devices are you going to use, and how will they work? How will you handle real-world concerns?
- If you plan to make or request any new hardware, what is it and how will it help?

Technical Approach Topics for Demo

- How do you foresee demonstrating your final product at the end of the semester?
  - You will have flexibility here. Be creative, but don't promise the world if you can't deliver.
  - Presume that you will have two opportunities
    - A class activity, with travel to a site as needed
    - The Honors Program poster session (with or without your hardware)
  - Trade-offs between difficulty and design time.

Management Plan - Timeline

- A Gantt chart will make up the bulk of this section of the proposal
  - “Show” the plan for the rest of the semester
  - Use Visio or any available tool to make a Gantt chart
- Still need a small amount of text in the document to give the chart context
  - Major tasks
  - Division of labor
  - Milestones

Realistic Timelines

- Do not ***force*** your plan in to the available time.
- If you run out of time on the Gantt chart, **you will run out of time in the project as well**.
  - In that case, simplify your proposed design instead of trying to make your current plan fit.
  - It's better to be realistic than to have to explain why you didn't complete your proposed design.
- Consider how long something will actually take, double it, then add that time to the Gantt chant.

Management Plan – Contingency

- Include your contingency plan, accounting specifically for how you will handle any problems that arise
- “If X does not work, Y will be used because it is already working and is easy to integrate.”
- Balance your contingency plan between “everything might fail” and “nothing will fail.”

Forming a Project Plan

- The proposal can only be written once you have a well-defined plan for your project.
- Experiment as much as possible before proposing.
- You have two weeks before the proposal is due.
- The good news is that this is a draft.
  - We will review this proposal, give you feedback, and you will turn in the “real” proposal later.