Assignment Sheet: Design Proposal
ECE 2031: Digital Design Laboratory

Length:
Body of the proposal (Introduction - Management Plan) is not to exceed 7 pages of text (typed, double spaced, not including figures – so you can have ~60 vertical inches of text total)
11-point “Times New Roman” font, double-spaced
1” top, bottom, and side margins

Point Distribution:
300 points; submit one proposal per group
(all members will receive the same grade)

Due Date:
April 7/8 (either one) at the start of lecture
(or earlier, to Kevin Johnson in E276).
Late work will not be accepted.

Description of Proposal:
A proposal is a document that identifies a specific problem and states how the problem will be solved. Proposals outline what you will do, how you plan on doing it, and why that plan was chosen. Your proposal should be technically detailed! This means that you must be familiar with the topic and do some experimentation to ensure that what you propose is feasible.

Spring 2016 Design Challenge:
The DE2Bots have enough groundwork completed to begin doing complicated tasks. One thing common to many robot projects is recognizing the presence of an object, to either avoid it or interact with it. Parts of this problem have been explored before, mostly in the form of basic object avoidance, but now you will continue by creating a more complicated object detection implementation.

Project Requirements in Brief:
- Create DE2Bot software to find and count the number of objects in an arena quickly and efficiently.
- Create a way for the robot to determine the coordinates of each object (X,Y).
- Combine the above to have the DE2Bot indicate the presence and location of the objects.

Project “Decision Space”: The Unique Features of Your Team’s Design
(these considerations are excellent fodder for proposal material)
- Technical considerations
  - How will the robot start the run and enter the arena?
  - How will you decide if an object is present?
  - How will you search for objects behind other objects?
  - How can you structure your code to make it easy to find multiple objects?
  - How can you make your methods easy to use for future engineers?
- Demonstration considerations
  - Will you attempt to find every object? Or is it better to choose a subset of searches?
  - Will you change anything between demo runs (e.g. your code)?
- Be creative; think outside of the box!
Content and Organization

For the purpose of this course, organize your proposal into the sections outlined below and follow standard technical writing conventions.

- Use future tense (“will”) to explain your proposed approach to solving the problem.
- You may use past tense for work that you have already completed by the proposal submission date.
- Avoid personal pronouns (“we” or “our”). Third person is commonly used in proposals (“the team will” or “the engineers will”), or use passive voice (“X will be done”).

Executive Summary (The ES is similar to an Abstract—it’s the entire proposal condensed into one paragraph)
- Briefly define the problem being addressed.
- Briefly discuss your team’s unique approach that will be used to solve the problem.
- Explain the strength of your team’s approach – why is your design the best?

Introduction (This section can be organized using descriptive subheadings)
- Describe the design problem and the project requirements to ensure that your reader is prepared to read your specific proposal and sees your interpretation of the problem.
- Briefly describe your team’s solution to the problem – enough to introduce the rest of the document’s headings.
- Do not assume that the reader has read the ES.

Technical Approach (This section should be organized using descriptive subheadings)
- Describe the technical approach you are proposing, addressing the specific requirements explained in lecture and supporting documents.
- Focus on explaining how your team will solve the problem (how will you create, design, implement, test, verify, demonstrate, etc.) and why you have chosen that design. Only stating your end goals will not convince your audience that your plan is worthwhile or feasible.
- If you have already done some experiments, include relevant results to support the feasibility of your design. Anything that you can prove is already working will increase confidence in your proposed plan.

Management Plan (Two subsections: project schedule, and contingency plan)
- The entire project schedule should be organized in a Gantt chart, which will make up the bulk of this section of the proposal. There will only be a small amount of text in this paragraph – just a summary of major tasks and milestones. If the Gantt chart is too large to fit in this section, you can refer to it in an appendix.
  - The timeline should be realistic. Don’t propose a design that can’t be completed within the time available.
  - Documentation is a major component of every project. Include the proposal, presentation, and design report in your plan.
  - You should include division of labor. Showing that your team is well organized is one of the most effective ways to inspire confidence in ability to complete your goals.
- Include your contingency plan, showing that you have considered what parts of your project might fail, and accounting specifically for how you will handle any problems that arise (if X doesn’t work, you will do Y).

Formatting:

1. Follow the template online, which has pre-set margins, headings and subheadings, and fonts.
2. Experiment with using bullets and numbered lists, if appropriate. You do not always have to organize your text in paragraph form. Organization should be effective, clear, and audience-appropriate.
3. Include as many descriptive figures as possible. They do not count against the page limit.
4. Attach an evaluation sheet (on top) before submitting. All team members must sign the evaluation sheet.