

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:** **July 15th 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.

Summer 2016 Design Challenge:

The DE2Bots have enough groundwork completed to begin doing complicated tasks. One thing common to almost all robot projects is simply getting to a destination: accurately turning to a particular heading, moving in a straight line, and knowing when a destination is reached. Parts of this problem were solved over previous semesters with the ATAN2 implementation and some simple point-to-point movement, and now you will continue by creating a more complicated, portable movement implementation.

Project Requirements in Brief:

- **Create portable software to move the robot to a given (X,Y) coordinate quickly and efficiently.**
- **Demonstrate the robot moving from point to point using your new routines.**

Project “Decision Space”: The Unique Features of Your Team’s Design

(these considerations are excellent fodder for proposal material)

- **Technical considerations**
 - How will you decide when you have reached your destination?
 - Will you correct for imprecise movement? If so, in what ways? Will you account for overshoot?
 - How can you structure your code to make it easy for future engineers to reuse?
- **Demonstration considerations**
 - Will you only consider the current destination? Or try to be more efficient over multiple movements?
- **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.
- 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.
 - **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.