Senior Projects
Fall 2023
Guidelines for End-of-Semester Report

Each group must submit an end-of-semester report. Each report should contain approximately 25 to 35 double-spaced pages (pages should be numbered). Every report should include at least the following components, in the order listed below, although you may name them differently. The reports must include references and citations (more on this later). Figures and tables should be numbered and include captions, and they should be referenced by number directly from the text (e.g., "As seen in Figure 2, ..."). There should be a table of contents in between the abstract and the introduction, indicating starting page numbers of sections and subsections. The Introduction should start on page 1. The intended audience should be any curious person with a relatively strong scientific background. The components of the report must include:

1. Title Page: This should include at least the title of your report and a list of the group members. I am not too picky with the other details; include whatever else you want.

2. Abstract: This should be a one page or less (but at least one full paragraph) summary of your entire report. What is the main idea behind your project? People generally read the abstract to determine if they want to read the entire document. Make it sound interesting.

3. Introduction: This should probably contain 2 or 3 pages introducing your project. Talk about the main idea and give a little history about related topics or talk about work related to your project. Almost everything in the introduction will be repeated in more detail in later sections. The purposes of this section are to provide a motivation for your project, to give a hint about what is coming in more detail than the abstract (but still not a lot of detail), and to get the reader curious. Although I am numbering this as the third component of the report, it should be Section I of your report, and the page numbers should start here.

4. Background: Discuss and explain all topics that the reader needs to understand in order to appreciate the rest of your report. This might include technical material involving a field of math, computer science, or engineering, if understanding any such topic is important for comprehending your work. If there is a major machine learning component of your project, for example, explain it (although if you are using machine learning for a minor component, I don't think you need to go into too much detail). The background might also include the history of the topic your project is dealing with. What are the milestones that you are building upon? The background does not have to be a single section, and it does not have to be named "Background" (it may consist of one or more sections named after the specific topics you are writing about). In all, this should probably range from 10 to 15 pages, but that may vary a lot depending on the nature of the project.

5. Related work: What projects, similar to yours, are being worked on or have recently been worked by other researchers? Describe them. Explain their importance. Explain how your project is different. If nothing is too similar, talk about work involving some of the same technologies or procedures. This should probably range from 3 to 5 pages.

6. Project description: Describe the details of your project. What will your final project, system, or device look like? What will it do? How will it work? What are the components? Explain the process to design and implement the project. Talk about the entire project, but do not specify yet what has already been done and what still needs to be done (that will be indicated in the a later section). This should probably range from 5 to 10 pages.

7. Ethical implications: Discuss the ethical issues you need to consider as you work on this project. What potential harms might occur? How could related technologies be misused in the future? You may consider global, economic, environmental, and social concerns. This section will vary vastly between projects, but it should probably range from 1 to 3 pages.

8. Status: What have you done so far and what do you have left to do? Include a detailed schedule for the work your group will do during the spring semester. The schedule should appear in the form of a Gantt chart. This may be an updated version of your previously submitted schedule, if the format can be nicely inserted into the report. This does not have to be fancy, and you can create it using any software you like. Also include, separate from the Gantt chart, a description of each activity, along with some details about what it entails. This section should be 2 to 5 pages long, including the Gantt chart. (The Gantt chart should be included as an easily readable figure within the main report, not as a separate document.)

9. Conclusion: This should be a final summary of the report. It should repeat the motivation of the project, and ideally it should leave the reader feeling excited by and impressed with the work you have done so far. This should probably range from 1 to 3 pages.

Note: *Citations in this report are extremely important*. All references should be listed at the end of the report, and citations to these references should appear throughout your report, especially in the background and related work sections, but in other sections as well. *Any fact that is not common knowledge and has been learned from another source needs to be cited*, regardless of whether there is a direct quote. If an entire paragraph describes information that came from one source, you can put a single citation at the end of it. The citation should generally appear after a space and before the end-of-sentence punctuation (sometimes it is OK to have a citation in the middle of a sentence directly after the piece of information you are citing). References should be listed at the end of the report in alphabetical order, or according to the order in which they are first cited. Citations can either include the author and year, like this (John Do, 2006), this (John Do and John Smith, 2005), or this (John Do et al., 2002); or you can number the references and just include the number in brackets like this [5]. If you use the former approach (names and authors) and want to cite multiple sources in the same place, include the citations in the same set of parentheses separated by semicolons; if you use the latter approach (numbers in brackets), include each citation in a separate set of brackets like this [3], [7], [12]. Use IEEE conventions for your references; examples of references to various types of sources can be found here: http://ieeeauthorcenter.ieee.org/wp-content/uploads/IEEE-Reference-Guide.pdf.

These reports are due on Tuesday, December 12, by noon. Each group should submit one electronic copy via email.