

MEMORANDUM

TO: ME 3210: MECHATRONICS STUDENTS
FROM: REBECCA DAPRA, SARAH READ, AND DOUG DOWNS, WRITTEN COMMUNICATION CONSULTANTS
SUBJECT: FINAL LAB REPORTS
DATE: 4/20/2004
CC: DR. MARK MINOR

The purpose of this memo is to highlight some of the difficulties that were found among the ME 3210 memos during a review of the final lab report. This memo will cover four common weaknesses that appear repeatedly in the reports. They include failing to address the assignment, poor organization, formatting, and mechanical issues. Not all reports share all these problems, but the recommendations below are important for all teams to consider. Overall, these memos were a solid first effort though most of them do require significant revision.

ADDRESSING THE ASSIGNMENT

Purpose: The assignment calls for you to “address characterization and control of a DC motor” in the context of four specific questions.

- How could the motor and sensors be used for position control of a wheel or track on your robot?
- What about velocity control of the wheel or track?
- What control gains and controller would you need to derive a particular first or second order response and how did those results compare to what you expected? Why would one response be better than another?
- Based on your results, what are your final recommendations (conclusions) for sensor suite and controllers for position and velocity control of a DC motor?

This means that reports that state as their purpose to “describe,” “outline,” or “discuss” are not addressing the purpose for the report. Ideally, your report should set out with a statement to the effect of “The purpose of this report is to recommend sensor suite and controllers for position and velocity control of a DC motor. These recommendations are based on a review of data obtained through lab experiments throughout the semester.” This means that reports which summarized the labs or reports that talked strictly talked about the motor without recommending specific conclusions for these applications did not fulfill the purpose of the assignment.

Scope/Proportion: Given the assignment’s purpose, the majority of this report should focus not on procedures, but on the discussion and recommendation/conclusion sections. Discussion sections that are only one paragraph long cannot thoroughly reason through the implications of the data. Likewise, an eight-page report with a six-page procedures section is clearly too focused on data-gathering details. This is a common problem when the majority of your time is spent collecting data. However, what is most important for you to establish in this final report is your ability to critically think about what you’ve spent the semester doing, and to demonstrate the results of your critical thinking in the report’s discussion and conclusion. The discussion section deals with the implications of the results. The conclusion summarizes these implications and makes recommendations based on them. It does not summarize the report.

Writing your own material: It is highly unethical to use another's words without crediting them. It is even more unethical to cut and paste passages from your lab assignment worksheets, and figures and tables from those worksheets, and to claim them as your own work.

ORGANIZATION

Overall, the lab reports lacked a level of sophistication that one expects to find in upper-level writing. Specifically, reports organized by addressing previous labs one by one, in chronological sequence, rather than by compiling data on particular problems related to the report's focusing questions lacked the sophistication that the later exhibited. For example, those reports whose Procedures section was organized by sensor and then controller types addressed the overall purpose of the report far better than those whose Procedures section simply listed the complete procedures from every lab already done.

Be sure you address the information that tables and figures suggest. Sometime figures and/or tables were included, but it was unclear what conclusions they supported, or pertinent data they held. While tables and figures contain primary, quickly readable data for your readers, your reader needs you to tell them what's important or worth focusing on among all the information in those figures. Your text, in other words, tell us how you want us to interpret your figures and tables.

FORMATTING

Headings and Sub-headings: While most teams used headings, some did not. On the whole sub-headings were underutilized. It is important to use heading and subheadings to guide your reader through your report. For example, within a given section of the report, subheads such as "Potentiometers" or "PID Controllers" help the reader move more quickly through your text because they don't have to read several sentences to know what issue you're addressing at any given point.

Page numbers: About half of the teams remembered to use page numbers, the rest did not. Again, this is an important organizing component to your report and they should be utilized.

MECHANICAL ISSUES

We won't go into too much detail on this issue. But we strongly recommend proofing your document for over-used words like, "quite," "very," and "simply". Also double check your report for verb tense consistency, and for oscillations in voice, i.e. shifting from third person to first person and back to third person.

SUMMARY

Keeping in mind these content and stylistic comments for your final draft should help you to successfully write an excellent lab report.