E178 Spring 2024 Final Report Rubric

1 Abstract 2%

The abstract articulates what was done, including a quick description of the experimental method. The abstract mentions quantitative conclusions.

2 Introduction/background 5%

The introduction motivates the work and explains experimental and modeling methods well enough to orient the reader to the paper. The introduction does not explain technical details in more depth than necessary to orient the reader: those details belong in the main body.

5 – Motivates work, explains experimental and modeling methods well enough to orient the reader to the paper.
4 – Motivates work too much or too little, explains experimental and modeling methods
weakly such that expectations of future sections are unclear.
3 –One of motivation or description of work/methods missing or very weak, the other serviceable.
2 – 3 –One of motivation or description of work/methods missing or very weak, the other poor.
1 – Missing both

3 Main body (50% total)

The main body of the document provides the information necessary to understand and replicate the experiment. The main body should be logically organized and should discuss every topic from the following list that is relevant to your project.

3.A Scientific and/or Engineering Goals 12%

An explanation of the specific phenomena the robot was designed to measure, why these measurements are important, and what can be learned from these measurements. A similar explanation should accompany each goal.

5 – As above. Theory of each goal articulated quantitatively with analysis of confounding factors. Similar depth for each goal.
4 – Basic theory present for all goals but either not articulated quantitatively or missing confounding factors.
3 – Missing information on one goal. Partial information on multiple goals. Basic theory present but lacks quantitative rigor and analysis of confounding factors
2 – Basic theory not well articulated or incorrect for multiple goals.
1 – Hard to interpret. Goals missing.

3.B Project Design 13%

An explanation of the project design. This should include discussion of the component selection and sizing and appropriate data rates and ranges.

5 – As appropriate, sensor and avionics selection, circuit topology, gain and signal conditioning discussed for each sensor. Power supplies and their uses enumerated. Mechanical modifications considered and well described.
4 – Purpose of some components or circuits is unclear. Omit description of some signal conditioning circuitry or decisions for calculating gain. Power supplies introduced without their uses. Missing schematics. Mechanical mounting omitted for some sensors or not in sufficient depth.
3 – Purpose of some components circuits is very unclear. Description of most signal conditioning circuitry limited to discussion only topology with no reference to signal conditioning or gain. Power supplies ignored. Mechanical mounting is very weak.
2 – Most circuits are very unclear. Signal conditioning circuits mentioned only trivially. Mechanical mounting not described.
1 – Design details fundamentally wrong or missing.

3.C Modeling 8%

An explanation of how numerical software, historical data, or your own models were used to predict the project's performance, the sensor measurements versus time, and how the modeling results informed the experimental protocol. There should be a similar analysis for each component.

5 – As above. Simulations or analytical models pursued, relevant data extracted for each sensor and control algorithm and modifications described and linked to simulation.
4 – Simulation or models present, relevant data extracted for multiple sensors / control algorithms.
3 – Simulation or models present, any relevant data extracted.
2 – Simulation or models present but very little relevant data is extracted.
1 – Simulations or models fundamentally wrong or missing.

3.D Experimental Procedure 8%

An explanation of the experimental protocol. e.g., The goals for each launch, prepping the rocket, starting and stopping the avionics, deployment details, recovery details, retrieval of the data, and processing of the data. Your checklists can be referenced.

5 – Reasonable description of launch procedure. Some team specific details.
3 – Poor description of launch procedure. Or generic / low effort regurgitation of checklist
1 – Missing or very bad.

3.E Comparison of Data to Model 9%

A comparison of the modeled (or expected) data from 3.C with the retrieved data from 3.D. Graphical comparison is preferred, but written comparison should be used as appropriate, especially to explain the graphical data. Error bars or estimates should be included in all experimental quantities. Whether each deployment is compared individually or all deployments compared together will depend on the data sets and the results. Descriptions of the degree of agreement should be made and possible explanations of the discrepancies should be present.

5 – Well thought out graphical comparisons between simulated, analytical and experimental results. Appropriate explanations in text. Error bars used carefully. Analyze agreement with hypotheses.
4 – Reasonable data organization and graphics. Some evidence of margining deployment and model data into easily digestible formats. Some reasonable conclusions drawn about the comparison between deployment and model.
3 – Poor data organization (eg: copied and pasted Matlab plots split over several figures) but a present and meaningful comparison of modeled data vs. deployment data.
2 – Poor data organization and poor analysis of results. Not well compared between model and flight, but some evidence of an attempt at comparison.
1 – Missing or very bad.

4 Conclusion 8%

The conclusions should not be a summary, but should be a summation of lessons learned, both about the process and of the comparison of the data and models. It should answer the question, "What does it all mean?" It should include recommendations for future work and/or future versions of the class.

5 – Summarizes, Lessons Learned, Clearly state conclusions from data, future work.
4 – Summarizes, Clearly states conclusions from data. Some other reflections.
3 – Summarizes, Some effort at stating conclusions from data,
2 – Summary only
1 – Missing or bad

5 Acknowledgement 1%

List all non E178 personnel who helped. Be sure to briefly describe their contribution.

5 – Is it there and not egregious
3 – Present with major oversights
1 – Missing

6 References 4%

List and cite all relevant references. Be especially careful to cite sources for figures that you have not drawn yourself.

5 – Is it there and not egregious
3 – Present with major oversights
1 – Missing

7 English usage (30% total)

7.A Grammar/Usage/Mechanics 15%

____ Superior – Free of spelling, capitalization, and usage errors. Few, if any, errors in punctuation. Sophisticated and consistent command of standard English.
____ Good – Number and type of errors does not interfere with meaning. Few, if any, spelling, capitalization, or usage errors.
____ Marginal – Number and type of errors may interfere with meaning at some points. Some spelling, capitalization, or usage errors. Some fragments and/or run-ons. Some errors in punctuation.
____ Inadequate – Number and type of errors obscure meaning. Frequent errors in spelling, capitalization, and usage. Many fragments and/or run-ons. Serious and frequent punctuation errors.

7.B Style/Organization 15%

7.B.i Transitions

____ Superior – Ideas/paragraphs/sections are connected by effective transition words and phrases.Precise, interesting, and accurate word choice. Writing style enhances readability of writing.
____ Good – Transitions used. Word choice is adequate to convey meaning.
____ Marginal – Few or no transitions. Overall style choppy.
____ Inadequate – No transitions. Sentence style choppy. Vocabulary limited.

7.B.ii Focus

____ Superior – Language choices (degree of jargon) and use of background material reflect attention to audience. Writing has a clear, distinct focus.
____ Good – Most material is appropriate to audience. Focus may be unclear at points.
____ Marginal – Little evidence of attentiveness to audience. Focus on topic not consistently sustained.
____ Inadequate – No evidence of attentiveness to audience. Writing is unfocused.

7.B.iii Organization

____ Superior – Generally well-developed ideas have a logical flow. Introductory and closing material is used effectively. Piece has a sense of completeness.
____ Good – Ideas may not be in their most effective order. Some main points are underdeveloped. Some attempt is made at introductory and closing material; piece has a sense of completeness.

____ Marginal – Order of ideas not entirely effective. Lack of distinction between main and supporting statements. Piece seems incomplete.
____ Inadequate – Lack of cohesive plan for presentation of material. No opening or closing. Incomplete.

7.B.iv Elaboration / Support
____ Superior – Each main idea is supported by detailed data or reasoning. All details are related to topic. Complete, correct documentation of a wide variety of sources.
____ Good – Details and/or data in some paragraphs may be sketchy; details may be insufficient to reach conclusions. All details are related to topic. Complete documentation of a variety of sources.
____ Marginal – Details may appear to be listed rather than integrated into coherent flow; some details are irrelevant. Marginal documentation of sources; some key sources may be missing.
____ Inadequate – Half or more of conclusions/main ideas are not supported by details. Half or more details cited are irrelevant. Inadequate documentation of inadequate sources.