

Lab class: Autonomous robotics

Report guidelines

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1 Overview

The reports are meant to capture what you have learned during the lab class. We will use them to probe whether you have understood the problems as well as your approaches to solving them, both on a conceptual and on a detailed mechanistic level. For each of the six reports that you have to hand in, we expect an elaborate scientific text.

2 Structure and scope

Here, we give you an exemplary structure which you can use for writing your report. The structure is similar to that of a scientific publication. You are free to deviate from this structure, but the points mentioned here (as well as those from the theoretical questions of each problem) must be contained in your final report.

Introduction Explains the problem that is being solved and the context in which it arises.

Explains the approach you used to solve the problem. This is a description on an abstract, conceptual level, without going into technical details.

Method Explains how the solution was technically implemented. Here, this should be a run-through of your program code, where you explain what the code does. You do not necessarily have to go line by line, but rather chunk by chunk. Use this section to show us that you understand the

code. Not describing part of the code here will lead to a deduction of points.

Discussion Explains how problem and solution relate to other work. In your reports, use this section to explain how this problem is different from previous problems, what the advantages of your solution are, and what may still be missing.

(Feedback) How much of a challenge was the problem for you? What was the most challenging part? How challenging was the writing? Writing two or three sentences is enough here. (This section is not part of scientific publications but helpful for us. It will not be graded, but much appreciated!)

Each problem description will have a list of theoretical questions. Think of these questions as hints to what you should write about in your report. Make sure that your report addresses all of the questions. If you do not address all questions, we will deduct points. Each question will fit well into one of the sections of the report. Do not simply write answers to each question but address the questions in the section that fits best and weave it into a coherent text. This means that you will have to think about where and how to answer the question *before writing the answers*.

For structuring the text, here are a couple of things you should look out for; we will use similar criteria for grading your text:

- Did you divide the report into appropriate sections, for example, the ones suggested above? Could a different structure help the reader understand your text better?
- Within sections, is the text structured in meaningful paragraphs or is it a single block of text?
- Do paragraphs have themes or are they an aggregation of incoherent sentences?
- Do paragraphs deal with a certain level of abstraction or does the text jump between levels of abstraction?

3 Format

Quality The quality of text and its format should be close to that of a Bachelor's thesis. This means clear, precise, full sentences (no bullet points) and no colloquial language. Strive for as clear a text as possible.

Ask yourself:

- Are sentences concise and to the point or do they consist of a lot of meaningless fill text? Can I remove words without losing information?
- Are the sentences overly long? Are there sentences you can split into several shorter, more concise ones?
- Does the text use colloquial language?
- Does the text state facts and results or does it use judgemental language and opinions?
- Does the text use the correct technical terms and does it use them in the appropriate places?
- Does the text introduce technical terms (and variable names) before using them?

Figures Please feel free to add figures to your text. It almost always helps the reader to better understand what you mean. It also helps your writing process because it gives you something to refer to. Unless you are including photos or screenshots, *always* choose vector graphics over bitmap images; they are much clearer. In graphs and plots, it is crucial to *always* label axes and include units if applicable. If you do not, we will deduct points. Make sure that you reference figures in your text and that you place a caption below each figure that describes it. You may copy figures from other sources only if you properly cite the source. However, keep in mind that figures you have prepared yourself can be created in just the way you need them to bring across your point. We thus suggest that you create your figures yourself.

Ask yourself:

- Could the text use additional figures to bring across a point?
- Where the text is using a figure, does it help the reader's understanding?
- Were the figures created by myself or are they copied from somewhere?
- Do I need to cite any source for the figure?
- Do all my figures have labeled axes, units, captions, and are they referenced in the text?

Length There is no minimum or maximum page limit. Just write as much as you feel necessary; by striving for a clear explanation, you will naturally arrive at an appropriate length of text. One page will probably not be enough space to address all questions while fifteen pages will not be concise enough. For most of the reports, writing three to five pages should suffice.

Language You may write the report either in German or in English. We suggest you write the reports in English to get the practice. If you are not sure, you could write the first report in English and decide whether you would like to continue in English for later reports.

Formatting You do not have to adhere to any formatting rules (no particular font, font size, or margins). Choose something that is clear and readable both in printed form and on screen. We suggest a serif font in size 12pt. Please include page numbers and large enough margins for us to write in.

Software You may use whichever word processor (e.g., Word, LibreOffice, Pages, Google Docs) or typesetting program (e.g., L^AT_EX) is most comfortable for you. We suggest using L^AT_EX, for which we provide a template. It is the de-facto standard for scientific publications and facilitates working on elaborate documents (e.g., Master's theses). If you have never worked with L^AT_EX before, the transition from something like Word may be hard, but it pays off over the long run. There is a lot of documentation¹ on the web to get started.

¹<http://en.wikibooks.org/wiki/LaTeX>