ENGR101 T1 2023

Engineering Technology

School of Engineering and Computer Science
Victoria University of Wellington

Draft report

Should cover all sections!
No more than 10 pages. However the sections to focus on are:

- Abstract
- Introduction
- Background
- Method
- Results
- Discussion (short)
- References (IEEE not APA)

Notes for the report - write almost all of it backwards

Find what is available already (Background).
Consider what are the main findings that need communicating? What was the main idea which drove your development process?

- I wanted code base (classes) to be reusable for future projects
- I wanted it to be as reliable as possible (it is kind of self-driving car, is it?)
- I wanted it to be as clear as possible - to make changes in the future as easy as possible. We suffered enough to tweak the code.
- None of the above, I just wanted to get B+...(don't do that)

Then structure a report that supports this position.

Then start writing the results. This leads on to clear conclusions, with any doubts or arguments (for and against) placed in a discussion. This is all supported by the methods, background and finally the introduction. The important points in each section are then lifted out to form the abstract.

First step - Background, state of the art

literature research:
Quick search for “’line-following robots with camera’ and you will get hundreds of results. (if you steal from one man, it’s plagiarism. If you steal from several, it’s research.)
Look how these reports were done. Usually you can find real-world applications in these reports.
Choose your application. It determines your approach.

Background

- There is no need to show off the breadth and depth of your literature research if it is not relevant.
- Pick up technologies which you will be using: what programming language, why image processing, best way to control/steer the robot.
- It can also provide instruction on the subjects that the reader needs to know in order to understand the current work.
- It only covers the area of work associated with the results, discussion and conclusion - it does not have to include the whole field!

Then we go to **Results**

Purpose: This section presents the evidence for the position (main idea) that was created by the work.
Did the approach you selected worked?

- The 'position' that you take on the work is critical, i.e. what did the work show?
- Describe important details of what occurred.
- Tables are useful for summary and comparison,
- Figures display relevant trends.
- Think about what you want to show.

Discussion

Purpose: Intellectual argument of the work.

- Here is where you explore the position taken based on the results and the background information from past studies.
- Alternatives and uncertainty are described, but where possible a single position should be taken, which can include the null result (there was no improvement due to the novel technique compared with the existing technique).
- It has similarities to a debate where both sides of the argument of presented, e.g. why might the position taken be incorrect?
- It is the best place to demonstrate understanding, mastery and insight into the subject. If you were to repeat what would you change?

Here are all technical details - **Method**

Purpose: Make your work reproducible. Somebody should be able to read the report and re-create your program.
Not necessarily in C++. Don't go into low-level details of your code, describe algorithms.
Never include actual code in your report - make it understandable for the reader who does not know C++.

- The method section should provide sufficient detail of the work for independent researchers to verify the results.
- All presumptions and assumptions need to be stated.
- Clear diagrams, pseudo-code, details of data are included.
- Discuss your team arrangements only from technical point of view

Introduction

- Think of the introduction as a funnel. Go from a broad scope to the focus of the work. This assists in leading the reader to a clear picture of the work. The introduction can be also a standard sequence of sub-sections:
  - Scope - what is and what is not being included in the report.
  - Motivation - why this project was done.
  - Aim - what you wanted to do.
  - Anticipated Benefits - include if not covered by motivation.
  - Constraints - time frame, team size.

References

As an example:
As demonstrated in [1]. . . Other studies [2], [3] have found. . .
References: [1] M. M. Chiampi and L. L. Zilberti, “Induction of electric field in human bodies moving near MRI: An efficient BEM computational procedure,” IEEE Trans. Biomed. Eng., vol. 58, no. 10, pp. 2787–2793, Oct. 2011, doi: 10.1109/TBME.2011.2158315.
Sources:

1. Journal papers
2. Conference Proceedings or Books
3. Lecture Notes
4. Web Resources

All references should have enough information to be uniquely identifiable (i.e. at least an author, a title and a location)

Abstract

Abstracts out all of the report for people who do not have time to read the whole report. An abstract says why it was done and what was important about it. It does not go into details how it was done.