

Dissertation Advice

Barry Denby

Griffith College Dublin

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Documentation

- ▶ The documentation requires you to describe in detail your research, however, you've been given a template for this, which is described in some detail here.
- ▶ You can write your document in Word, LibreOffice, LaTeX or any other editor once it produces a document in a close similar format to that described here.
- ▶ It should be at least 40 to 50 pages in length excluding front and back matter.

Documentation: Formatting

- ▶ Paper size must be A4
- ▶ Main body text must be Times New Roman 12pt
- ▶ Line spacing must be 1.5 times normal line spacing
- ▶ Margins: standard MS word/LaTeX margins throughout

Documentation: Structure

- ▶ You have a rough structure in the template you've been given but we will expand on each of the items here.
- ▶ Front Matter
 - ▶ Title page: Standard format which you should be able to recreate pretty quickly
 - ▶ Table of Contents: Another standard item however, leave this until last so you only have to generate it once. Otherwise you will waste much time updating this.
 - ▶ List of tables: Smaller version of table of contents that only lists the tables used in your document. Should include the captions of each table. This should be one of the last things you do like the table of contents.

Documentation: Structure

- ▶ Front Matter
 - ▶ List of figures: Similar to list of tables but for figures. Leave till last
 - ▶ List of Algorithms: Similar to list of tables but for algorithms. Leave till last
 - ▶ Disclaimer: The standard plagiarism disclaimer that you see on assignment cover sheets. You can get this from said sheet. Must be signed and dated on submission.
 - ▶ Abstract: A short one page description of the main idea of your project, How you went about doing it and the most significant conclusions

Documentation: Structure

- ▶ Front Matter
 - ▶ Acknowledgements: Generally used to thank people for their support. This should be one of the last things you write.
- ▶ Chapters: This along with appendices will make up the 40 to 50 pages of your work. It is not a strict requirement that you must use these chapters but structure will work for most.
 - ▶ if you are unsure if this format works for your project please consult your supervisor.
 - ▶ Introduction: An expanded version of the abstract minus the conclusions.

Documentation: Structure

- ▶ Chapters:
 - ▶ Background: Covers everything you have read/researched during the project. there are two main sections here
 - ▶ Literature review: All of the documentation, research papers you have researched during the project
 - ▶ Similar work: Existing work that is similar to your own, it is important that you differentiate yourself from these works.
 - ▶ Methodology: Explain what is needed to complete the dissertation. This will vary from dissertation to dissertation so discuss with your supervisor about this.
 - ▶ System Analysis and Design: Where you discuss the theoretical design of the system. How it should work, how it all connects together, the flow of operations etc.

Documentation: Structure

- ▶ Chapters:
 - ▶ Implementation: discussion of the implementation of the software. Should discuss the challenges encountered, their solution, and any changes that needed to be made to the design
 - ▶ Only include snippets of code or screenshots if they are needed to explain a point.
 - ▶ If you include any you will need to discuss them in your text.
 - ▶ Code should be kept to 15 lines or less
 - ▶ Will be obvious if you try to pad out your page count with lots of code and screenshots.
 - ▶ Testing and Evaluation: All test experiments, results, and user feedback should go here and be discussed
 - ▶ Conclusions: what are the main results of the work you have done

Documentation: Structure

- ▶ Back Matter: the last parts of the document
 - ▶ Bibliography: Absolutely required. All of your references should be listed here. You must refer to each reference at least once in your document.
 - ▶ Appendices: Optional. Generally only used if you have a large mathematical argument or piece of code that cannot be left out but would break up the flow of the document. Each appendix must be referenced at least once in the chapters.
 - ▶ Supervisor can help you decide if you need one or not

Referencing and Bibliography

- ▶ Hugely important in any research project or dissertation.
- ▶ Includes any text that you have read or used. includes: books, research papers, manuals, web sites etc.
- ▶ Pick a reference style and be consistent with it.
- ▶ One of the most common used in CS is that each reference is labeled with a number and the number is used in the main body of the text
- ▶ Any reference in the bibliography must be referenced at least once in the main text

Writing Style and Advice

- ▶ The worst thing you can do when writing a document like this is to write it from start to finish.
- ▶ The problem with this approach is that you will have to remember the ordering and logic of all of your arguments up to that point.
- ▶ It may be necessary to revisit earlier parts of the document and reorder and rewrite to suit things that you add later.
- ▶ The first place to start is with a brain dump.

Writing Style and Advice: Brain Dump

- ▶ In this you note through bullet points everything that you need to discuss and talk about in your document without worrying about order
- ▶ Try using something like a text editor for this
- ▶ Once everything has been exhaustively dumped then you reorder and organise the talking points into some reasonable logical order that fits in with the structure you have been given.
- ▶ From here you can expand those bullet points into the full text that is needed to explain the point, concept, hypothesis, theory, or algorithm that you need to communicate.

Writing Style and Advice: Brain Dump

- ▶ The reason for this is that it allows you to jump around the document and write the bits you are most confident on first.
- ▶ One of the biggest mistakes of writing a document this size is to try and write it from beginning to end
- ▶ If you try writing beginning to end you will need to remember everything you have written at all times to ensure you do not repeat yourself or contradict yourself.
- ▶ The other advantage of a brain dump is that you have a living structure of a document such that if you remember something later that wasn't in the initial dump then you can add it in and put it in an appropriate place easily.

Writing Style and Advice: Writing Style

- ▶ Be very careful how you communicate however. There is a specific writing style for this kind of document called scientific writing.
- ▶ The style is factual and very dry to read. There is no emotion in this style of writing at all.
 - ▶ e.g. Do not use statements like “We feel” or “I hope”
- ▶ In Computer Science we generally don’t talk in the first person.
 - ▶ Avoid using words like “I”, “me”, or “my”
 - ▶ Stick to things like “we” or “the Author(s)”

Writing Style and Advice: Writing Style

- ▶ You may assume that your reader has at the very least an Honours degree in Computer Science.
- ▶ Thus they don't need basic programming concepts, datastructures, algorithms, and so on explained to them.
- ▶ Keep your sentences short and to the point. A sentence should express an idea or at most two ideas and should generally be 30 words or less
 - ▶ Any longer and you need to split it up.
- ▶ You should be able to stand over and defend every sentence you write.

Writing Style and Advice: Writing Style

- ▶ Every idea/sentence that you express should be defensible in its logic and construction.
- ▶ Paragraphs are a collection of related ideas
- ▶ Sections are a collection of related Paragraphs.
- ▶ Chapters are a collection of related Sections.
- ▶ How these fit together and what content they contain depend on your particular Dissertation.
 - ▶ You will need to discuss this with your supervisor

Writing Style and Advice

- ▶ Avoid the use of marketing type language
 - ▶ e.g. this will revolutionise the world.
 - ▶ e.g. this is a game changer.
 - ▶ I've seen far to many variants of these in previous years.
 - ▶ This is not the time to try and channel your inner Steve Jobs
- ▶ Use more factual statements instead
 - ▶ e.g. This algorithm on average is 10% quicker than algorithm x ...
 - ▶ The prediction rate of this algorithm is better than algorithm x ...
 - ▶ If you make claims that will not be obvious to your reader make sure you have evidence to back it up
 - ▶ As the saying in science goes "Extraordinary claims require extraordinary evidence"

Writing Style and Advice: Figures

- ▶ A Figure (diagram, graph, schematic, code etc) should only be included if it illustrates a talking point of the text.
- ▶ A Figure without a reference in text is considered surplus and will be ignored.
- ▶ If you include a figure make sure to mention it somewhere in the text
 - ▶ Ideally very near to the figure if possible
- ▶ Always mention the figure before explaining a concept not the other way around.
 - ▶ e.g. “Figure x.y shows ...”
 - ▶ instead of “... this is shown in Figure x.y”
 - ▶ otherwise the person has to reread that section of text now that they know what figure it refers to

Writing Style and Advice: Code

- ▶ Generally speaking code should only be included if it involves a non-trivial algorithm that has a significant bearing on your Dissertation.
 - ▶ e.g. UI layout files, package information files are not needed unless this is what your dissertation is about.
- ▶ Code should be kept to 15 lines or less.
 - ▶ If you are above this (not by much) you can still include if necessary.
 - ▶ If it is much bigger than this then split it into an appendix
 - ▶ If you are not sure ask your supervisor about this.
- ▶ All code used in figures must be explained in the text.