

AUBIST Laboratory MS Thesis Guideline

The following discussion gives some general guidelines for the organization of your thesis and a rough idea of the approximate length of each chapter. Keep in mind that a chapter may need to be longer if that is what it takes to properly present the material with figures, tables, etc. To give more details, let's assume the topic for your thesis is "BIST for FPGAs".

Chapter 1. Introduction (7-10 pages)

This should present a high level overview of motivation and background material so that at the end of the chapter you can state (again at a high level) what your thesis is about – what is the problem you are trying to solve. Using our "BIST for FPGAs" example, you need to explain (at a high level) what is an FPGA, why do we need to test it, what is BIST in general, what is BIST for FPGAs (since it has already been done), what has been done/not done, and finally your thesis statement explaining what is different about your BIST for FPGAs. In terms of references, every paragraph should have references since all of this discussion is general background (it has already been published/done by someone else – you have not contributed anything to the technology at this point).

Chapter 2. Background (25-30 pages)

This chapter should follow the same organization as Chapter 1 but in a lot more detail with all of the material on prior work that a person will need to know to completely understand your thesis. This chapter will describe the major accomplishments in the particular field to the extent that you can clearly compare/contrast your method/approach in subsequent chapters. At the end of this chapter you should re-state your thesis problem in more detail given the background material you have presented in this chapter. In our BIST for FPGAs example, you would discuss in more detail FPGAs (i.e., their architecture, programming technologies, and special features) with particular attention to the architecture and features of the FPGA (and their associated CAD tools) you will be using. Next, you would go into more detail on FPGA testing and the problems associated with testing FPGAs followed by a more detailed discussion of BIST and what has been previously done in BIST for FPGAs (and in BIST in general) that is related to the BIST you will be doing/describing. Finally, you would summarize the prior work in BIST for FPGAs, how they work, their advantages/limitations – pay particular attention to those approaches that are most like your method. Then you re-state your thesis topic in detail with emphasis on what is different about your topic. As in Chapter 1, every paragraph should have references since all of this discussion is general background (it has already been published or done by someone else – you still have not contributed anything at this point in your thesis).

Chapter 3. Your Approach (15-20 pages)

Here you will begin to describe what you have done and how you have done it in detail. The references will probably be sparse in this chapter since this is your work. BUT, when ever you compare to other work or when you have gotten ideas for your work from other peoples' work, you need to include the references.

Chapter 4. Experimental Results (15-20 pages)

Here you will give the results of your work with evaluation and analysis of how good your work is and how it compares with any prior work (being sure to reference the other work in those comparisons). Be sure to take advantage of free information/data that is provided by the CAD tools like timing analysis (maximum clock frequency), resource usage (PLBs and routing), etc. for different size (or speed grade) parts in the family. These are important issues that present a more thorough analysis of your work.

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Alternate Approach to Chapters 3 and 4 Organization:

Let's say you implement your BIST for FPGAs on two different vendors FPGAs with different architectures. Chapter 3 could cover the overall approach and its application to one FPGA (with experimental results) and Chapter 4 could cover the application to the other FPGA with a discussion of modifications required to the approach for application to the other architecture (again with experimental results).

Chapter 5. Summary and Conclusions (5-7 pages)

Summarize your work, emphasize what you think are the major contributions of your effort, and compare your work with previous work. Include a section on areas for future research which describes what you would do differently if you were starting over as well as where you would take this work if you were to continue your research and development in this area. Include any other ideas you think should be explored.

The following guidelines are intended to help you write your thesis in a manner that makes it readable, understandable, and makes sense. Therefore, you should follow these guidelines to reduce the amount of re-work and re-writing you would undoubtedly have to do otherwise.

1. You should write the thesis considering that your audience is a recent BS ECE graduate. Therefore, you need to present and explain the material at a level appropriate to someone who only has a general BS ECE background. You need to carefully think about the organization of each chapter in order to obtain a good flow that doesn't leave the reader confused or asking a bunch of questions (like What in the world is the point of this section, chapter, thesis?).
2. When you write each chapter, read it over (and re-read it) to make sure that the material is understandable and makes sense. Once you think that you have the material at the appropriate level of detail, give it to one or two of people in the lab to read and have them point out **any and all** material they cannot understand or find confusing, then you re-write that material until it is clear to them. Also re-read your collection of chapters together to make sure that they flow well and that there is sufficient background information in the previous chapters to understand the one you have just completed.
3. From the very beginning you need to start your reference list and cite those references in your chapters. Submit that reference list to me along with your chapters and update your reference list with each chapter. There is no excuse for inconsistencies in your reference list format or incomplete references. It is also a good idea to include a list of acronyms as an appendix.
4. There is no excuse for inconsistencies in formatting chapters, figures, tables, spacing, right-hand justification, fonts, defining acronyms, etc. The graduate school has a recommended format that you need to check out and look at previous theses. Be sure to use the word processing tools to find/fix spelling and grammar errors.
5. Each time you submit your chapters, you need to also return the previous version that I marked up for you to use in your re-work and modification of the thesis.
6. Remember these points: If I can't understand what you are talking about, if it doesn't make sense to me, then you have a serious problem since I know more about your topic than anyone else. You can't schedule a thesis defense until I say your thesis is ready to go to your thesis committee.

Happy AUBISTing!!!