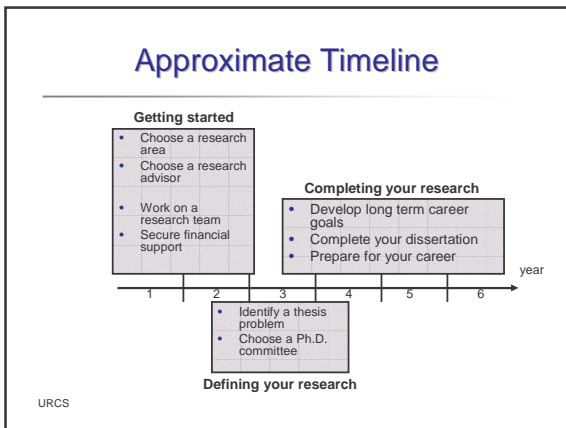


Ph.D. Proposal Writing

Sandhya Dwarkadas
University of Rochester

“Writing a PhD proposal is a frustrating process at first – you will find there are a lot of things you don’t know. But the reward is enormous – you will find things that nobody knows.”

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The Purpose of the Proposal

“The proposal should convince the reader (committee) that the problem is an important one and that you have a promising approach to solving it.”

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- What is the student’s research question?
 - Is it a good question?
 - Is it useful
 - Has it been answered before
 - Has the student performed due diligence to ensure that the question can be answered?
 - Will this be an adequate and original contribution to knowledge?
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- The idea
 - The details
 - The plan
 - The organization
- URCS

The Idea

- Begin with an area that excites you and can make a difference
- Follow with an in-depth look at prior art
- Formulate a nugget that will become the “thesis” of your dissertation

What is a thesis?

From Merriam Webster Online: “a position or proposition that a person (as a candidate for scholastic honors) advances and offers to maintain by argument”

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Choosing a Research Area

Many areas could be “right” for you

Criteria

- Exciting and interesting area
- Important problems in area
- Activities suitable to you (theory vs systems)

Ways to identify a research area

- Take courses, attend seminars and colloquia
- Talk to professors, visitors, other students
- Read widely
- Learn about yourself and what you like to do
- Participate in a research project

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Inspiration Versus Perspiration

“There are two main ways to find a topic: inspiration and scut work. Inspiration is great, but unpredictable. Scut work is a lot more dependable. In other words, join a project, build something, and see what’s hard about it. There’s a good chance that whatever caused you difficulty has a thesis topic in it.”

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Identifying a Thesis Problem

Become an expert in the area

- Read papers, talk to experts, attend talks, ...
- Question assumptions made by previous work

Consider some potential thesis problems

- Thoroughly understand the problem
- Break the problem into manageable pieces
- Have short-term and long-term goals
- Have a back-up plan

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“Start with the questions, not the answers”

“Don’t lose the forest for the trees”

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“Shoot for the moon but have something tangible and defensible if you fall short”

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The Details

- How will you support your thesis?
 - How will you demonstrate/evaluate your ideas?
 - What equipment/software will you need?
 - What will you build, simulate, analyze?
 - What is your metric of success?
 - What will you compare against?

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The Plan

- Partition work into publishable units
 - Make sure infrastructure you need is in place
- Set a goal/deadline, e.g., conference submission
- Chart a roadmap
- Periodically regroup and reevaluate to make sure that your roadmap is realistic and your goals are being reached

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The Organization

- Motivation
- Thesis
- Related work
- The details behind the thesis/what's new
- Preliminary results
- Plan of action
 - Partition work into publishable units
 - Keep major conference deadlines in mind

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The "Thesis" or Problem Statement

- A concise statement of the question your thesis tackles and how you will answer it
- The details in this sections should provide
 - The question you want to answer
 - Why this question is worthwhile
 - Support (via reference to related work) that it has not been previously answered
 - Why you believe your solution will address the problem

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Writing Style

- Clear organization of individual ideas
 - Sections and paragraphs should have a logical flow
 - Define terms before you use them
 - Keep forward references to a minimum
 - Each section represents a high-level topic/organizational unit
 - Each paragraph contains a single idea with supporting details
 - Each sentence expresses a single point/detail
- Pay attention to detail – spelling and grammar

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Useful Resources

- "The Elements of Style", W. Strunk, Jr. and E. B. White
- "How to Organize your Thesis", Prof. J. W. Chinneck,
<http://www.sce.carleton.ca/faculty/chinneck/theses.html>
- "A graduate school survival guide: So long, and thanks for the Ph.D.!", R. T. Azuma,
<http://www.cs.unc.edu/~azuma/hitch4.html>

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