

# Frequently Asked Questions About Doctoral Dissertation Proposal Examination in Computer Science

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## 1. What is a proposal defense?

A proposal defense, which consists of an oral presentation and an oral examination, is one of the steps designed to prepare you to become an independent researcher. During the proposal defense you will explain the general problem or research area of your work. You will demonstrate your understanding of the background material in this area and your general grasp of how the problem you have picked fits into the big picture. Before your proposal defense, you will submit a written dissertation proposal to your proposal committee. (See Question 8 for details.)

## 2. What is the format of the proposal defense?

The proposal defense consists of a presentation (50 minutes), a question period, and a closed session with the committee. The audience may stop and ask you questions at any time, so often the presentation runs longer. You should time your presentation to be 40 to 50 minutes if there are no questions. Here is advice for the format of the presentation:

- (a) Since you only have 40-50 minutes, you should cover elementary background material quickly.
- (b) It is essential that you get to substantive topics in your allotted time.
- (c) You must be ready to answer elementary questions on the background material of your area. You should also be prepared to discuss related work and to describe how your work is different.
- (d) You must prepare your talk carefully, making sure you have the formulas and analyses correct. Only the content of this talk really matters, and not any particular flashy format.
- (e) It is a good idea to put small examples to the side to show that you understand any formulas and can explain them.
- (f) You want to convince the committee that you clearly understand what you are doing.
- (g) Emphasize your research contributions and future directions.
- (h) The material of your presentation should reflect your written dissertation proposal, which is described in more detail below.
- (i) You should practice your presentation prior to the defense, ideally with some friends who can ask you questions about things that aren't clear.
- (j) Your advisor should always review the proposal before you submit it to your committee members.
- (k) Please proofread your dissertation proposal and slides carefully.

## 3. What kinds of questions will my committee ask me?

One of the purposes of the proposal defense is to demonstrate that you understand the problem that you are working on. Remember that sometimes your committee members will ask you questions, not because they want to know the answer, but because they want to know if you do. They will question the meaning of formulas, your graphs, the assumptions, and especially your contribution and your ideas.

4. What is the composition of the committee?

The committee consists of your advisor and three faculty members from computer science. Usually this committee ends up as part of your dissertation committee, but that is not required. You should pick your committee in conjunction with your advisor to represent expertise that might be useful to you in completing your dissertation. Your committee must be approved by the PhD doctoral studies committee.

5. When should I do my proposal defense?

Generally you should try to do your proposal defense in your third year.

6. How does the proposal defense relate to the other exams that I have to take as a doctoral student in CS?

There are three major exams that you must pass to earn a PhD in CS. These exams measure your progress towards becoming an independent researcher.

The first exam is the written exam taken at the end of the first year. This exam verifies your competency in core subjects. When you pass this exam, you can sign up for doctoral research.

The second exam is the proposal defense, which is also the CS PhD oral examination. The purpose of the proposal defense is to make sure that you understand the problem and have the necessary background to do research in the area you have selected. The exam also establishes that you have a game-plan for your research. When you pass this exam, you advance to candidacy and can sign up for doctoral dissertation.

The final exam is the actual dissertation defense. At this exam you explain and defend your original research as embodied by your thesis document and publications. You set your work and contributions in the bigger picture of the field.

7. What should I do to prepare for the proposal defense?

- (a) a. Pick a proposal committee and get the committee approved
- (b) b. Prepare your dissertation proposal and submit it to your committee at least 2 weeks before the defense. (Ideally you should do this 4 weeks before the defense and then meet individually with your committee members 2 weeks before to discuss any changes that need to be made in the dissertation proposal before the defense. You should also give your committee copies of the papers that you have co-authored.)
- (c) c. Prepare your presentation
- (d) d. Schedule the defense with the Department office and your committee members. You should allow a 2 hour block of time for this.
- (e) e. Practice your presentation
- (f) f. Make any corrections or complete other work required by your committee

8. What should be in the dissertation proposal?

A written dissertation proposal should be submitted to the student's Oral Examination Committee at least two weeks before the presentation. The guidelines state that the dissertation proposal should:

- (a) a. Present an overview of the background and related work in the field.
- (b) b. Explain the basic idea of the dissertation topic.
- (c) c. Argue why that topic is original, challenging, and important.
- (d) d. State what kind of results are expected and present preliminary results, if any.
- (e) e. Make a plausible argument that these results are obtainable within a reasonable amount of time.

The proposal should also contain a clear description of your contribution to the publications and work done jointly so far. You should also clearly delineate in both your presentation slides and in the dissertation proposal which results are yours and which results you are using from other work (with a reference).

9. How many references are enough?

The reference list for the proposal may not include all of the references that end up in your dissertation, but it is important that you have found the relevant related work so that you don't duplicate results for your dissertation. You include recent references and references that are from high-quality venues. Part of learning to become an independent researcher is to learn what the high-quality publications are and to recognize high-quality work. If you have any questions, ask your advisor or committee members. You should not have references that are mostly 5 years old or are all less selective conferences. At least some of your references should be from the top journals or conferences in that area.

10. Will my proposal defense really take 2 hours?

Proposal defenses usually run 1½ to 2 hours. Plan on 2 hours.

11. What if I change my topic after I pass the proposal defense?

You do not have to pass the defense again if you make minor changes in your topic or the plan to complete your dissertation, but you need to keep your committee and the Graduate Advisor of Record informed. The Graduate Advisor of Record in conjunction with the Graduate Studies Committee will decide whether the change is major enough to warrant redoing the dissertation proposal or changing the membership of your dissertation committee.

12. What is the role of the advisor versus the committee?

Your advisor plays the most important role in guiding your research, and will generally be the one to tell you when to do your proposal defense and your dissertation defense. However, your committee as a whole has to pass you on these milestones. They can be a valuable resource in suggesting directions. They also are likely candidates for recommendation letters when you graduate. You should keep them informed of your progress.

13. What does the PhD degree mean?

Earning a PhD signifies that you are an independent researcher who has made original contributions to your field. Even seemingly modest results can take on more importance later.

14. How long is it between the proposal defense and the dissertation defense?

The key to earning a PhD is to make an original contribution. As such there can be no fixed time limit. A typical time is one to two years, but this varies considerably depending on student and research area.

15. How do I know when I am becoming an independent researcher?

Becoming an independent researcher doesn't happen overnight. You will begin by working with your advisor and possibly a small group of other students on research projects, often in a supporting role.

As you mature, you should be contributing more of the ideas and doing more of the writing. Research quality is generally judged by publication quality. As your contribution to the research increases, generally your position in the authorship moves forward. (Some theoretical fields always publish alphabetically, but most go by contribution, with the advisor going either first or last in the list.) Your first paper will probably not get into a great venue unless someone else does the writing. As you get more experience and the quality of your work increases, you should be targeting better conferences and journals. It is important to make a significant enough contribution to the work that constitutes your thesis that you are first author on the publications reporting that work. However, you can't expect to be first author if you do not make this significant contribution.