Research Examination
Computer Science Department
Colorado State University

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Introduction

These guidelines and policies are intended to help Ph.D. students and advisers who are preparing for the research examination which is one of the requirements for the Ph.D. degree in Computer Science at Colorado State University. The guidelines here are quite specific, in order to promote consistency and fairness between students, and at the same time to establish and maintain high standards.

The research exam is internal to the department. It is not the university preliminary examination, which is also called the thesis proposal exam in the Computer Science Department. The research exam may not be merged with the thesis proposal exam.

The research exam is intended to be a strong predictor of success in Ph.D. research. Failure of a student to pass the exam's requirements in a timely manner indicates that the student may not continue in the Ph.D. program.

Research Examination Procedure

The following 5 steps must be completed as part of the research exam: (1) Meet with adviser to select topic and core bibliography, and to form the examination committee; (2) File a Research Examination Notification Form with the Graduate Program Committee at least one month, but no more than two months, before oral examination; (3) Produce the written part of the exam and distribute it to the committee at least two weeks before oral examination; (4) Present the oral part of the exam; (5) Submit the written part to the Graduate Committee.

Time Limits

A graduate student who continues into the Ph.D. program after earning a Masters degree in the Colorado State University Computer Science Department must attempt the research exam within 1 year after earning the Masters degree. All other Ph.D. students must attempt the research exam within 2 years after entering the Ph.D. program in the Computer Science Department. Students who fail on the first attempt must retake and pass the exam no later than the end of the following semester. Specifically, a failed attempt in the Fall must be retaken in the Spring, and a failed attempt in the Spring must be retaken in the Summer or Fall.

Meet with adviser:

A student must have a Ph.D. adviser before taking the research exam. The student will work with his/her adviser to develop a topic for the examination and prepare an initial bibliography of 5 papers in the topic area. The student and adviser will also form the examination committee. Because this is an exam, once the initial bibliography and committee have been created, neither the adviser nor the committee may provide exam-related help to the student.

The examination committee:

The committee for the research exam consists of three members: the student's adviser, and two tenure-track faculty members chosen by the adviser, with the consent of those faculty members. The adviser will serve as chair of the committee. Only tenure-track faculty members with primary appointments in computer science may serve on a research exam committee.

The Research Examination Notification Form:

At least one month before the oral part of the exam, the student will submit a Research Examination Notification Form to the Graduate Committee. This form will include: A short (paragraph) description of the topic/area of the exam, the names of the adviser and committee members (and their signatures), the list of the 5 initial papers that form the basis of the exam, and the expected date of the examination.

The written part of the research examination:

Before the oral part of the research exam, the student will produce a written report. The report must be made available to the examination committee at least two weeks before the oral portion of the examination.

The examination will be based on a set of papers defined by the student and his/her adviser. In addition to the initial bibliography of 5 papers, the student will be expected to include at least 5 additional papers in the bibliography of the written report. These papers should include current work in the topic area.

The report must be presented and formatted well, in a style similar to that prescribed by a peer-reviewed conference paper in the topic area. The report must be between 7,000 and 10,000 words unless otherwise stipulated by the committee. This word limit excludes the bibliography.

The research examinations will have the attributes of a "creative survey," where the student both summarizes and critiques existing work on a subject. The report is not required to contain original research. Its emphasis must be to provide deep and comprehensive insight into high-quality existing research on a specific topic. The research examination must exhibit awareness of the research frontier in an area and potential research directions. The examination should demonstrate awareness of weaknesses and gaps in the published work. The examination tests the student's technical communication skills as well as subject mastery both orally and in writing.

When writing the report, the student may receive advice and editorial assistance (e.g. from peers, the Writing Center). However, the writing and content of the report must be the work of the student alone. S/he must qualify according to standard academic norms as the sole author of the report.

In an "acknowledgements" section at the end of the report, the student must disclose all assistance received. The disclosure must include enough detail to make clear that the student qualifies as the sole author of the report. If a student receives undisclosed assistance, s/he is subject to penalties for academic dishonesty.

The oral examination:

The oral part of the research exam will be announced and open to the public. Computer Science faculty and students will be encouraged to attend these examinations. First, the student will give a presentation lasting about 50 minutes. The committee may allow or restrict questions during the presentation. Second, the audience may ask questions. Third, the audience will leave, and the committee members may ask further questions. Finally, the student will leave and the committee will deliberate.

The evaluation

At the conclusion of the oral exam, the members of the committee will fill out an evaluation form and report the results to the student and the Graduate Committee. The evaluation form is standardized and is designed to elicit feedback from the examination committee that is probing, clear, and useful. The committee must complete and sign the form. The completed evaluation form will become part of the student's permanent file. A copy will be given to the student.

In order to pass the research exam, a student must receive a unanimous evaluation of "fair" or higher by the committee on every item on the evaluation form.

The student is evaluated on five criteria:

- Is the student able to find relevant literature and acquire depth of knowledge in a given research area?
- In the given research area, does the student show deep insight and perform a critical analysis?
- Does the student have the breadth of knowledge to perform research and the ability to acquire new knowledge independently?
- What is the quality of the writing of the report, compared to a typical paper at a peer-reviewed conference in the given research area?
- What is the student's ability to present research and communicate technical ideas orally?

For each item on the evaluation form, the committee must rate the student "excellent," "good," "fair," or "unsatisfactory."

- The rating "excellent" means at the level of a good paper or presentation at a peer-reviewed conference in the area of the exam. This rating is expected to be rare.
- The rating "good" means at the level of a paper or presentation acceptable by a peer-reviewed conference in the area of the exam.
- The rating "fair" means that improvement is necessary, but whatever weakness is observed is not sufficient to preclude progressing in the Ph.D. program.
- The rating "unsatisfactory" means below the "fair" level.

The four grading levels, with their specific descriptions, exist to provide clear feedback to each student. Grades will not be published but will be recorded in each student's file.

Failing the research examination

A student who fails on the first attempt at the research exam may retake it. The student must file a new research exam Notification Form. The retaken examination may be with a new adviser, topic, and/or committee. For the retaken examination, the initial bibliography of 5 papers may not contain any papers that were included in the initial bibliography for the first attempt. The student must retake the exam no later than the semester following the failed attempt. A failed attempt in the Fall must be retaken in the following Spring; a failed attempt in the Spring must be retaken during the following Summer or Fall. A student who fails on the second attempt or who exceeds the time limit for passing the exam must leave the Ph.D. program.

Disposition of written examinations:

The department will retain copies of all exams, but will restrict access to faculty. The Graduate Committee may solicit permission from the student to make some exams public for the benefit of their peers.

Exceptions to the above procedure:

An adviser may petition for an exception or a change on behalf of a particular student. Each petition must be in writing, must be sent to the Chair of the Computer Science Graduate Program Committee and must come from the adviser (not the student). The petition must include a written explanation of how granting the special request to one student is nevertheless fair to all students.

A petition will be referred to the Graduate Committee if the committee chair so chooses, or if the adviser so requests. The decision of the Graduate Committee, by majority vote, will be final.

The graduate secretary will keep a record of all petitions, both granted and denied, in order to help the Graduate Committee be fair in considering petitions.