

**PROCEDURES FOR THE HCI
THESIS:**

For the

Master of Science in Human-Computer Interaction

HCI GRADUATE PROGRAM

Indiana University School of Informatics

535 West Michigan Street
Indianapolis, IN 46202
Indiana University - Purdue University, Indianapolis

(IUPUI)

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I. GETTING STARTED

This document is an instrument for ensuring clarity, consistent standards, high-quality and timely completion of the students' research and thesis. Responsibility for understanding all aspects of the thesis process, including due dates, deliverables, and obtaining signoff signatures, resides solely with the student.

Difference between a Graduate Thesis and Graduate Project

- **Graduate Thesis:** Graduate research leading to a written Master of Science HCI Thesis is a scholarly exercise, the primary purpose of which is the advancement of theoretical knowledge within the discipline of HCI.
 - The focus of an HCI master's thesis is NOT a project, but an original contribution to the discipline of HCI. Graduate students should carefully consider how they might make such a contribution to form the basis of a thesis proposal. (For further details, students should read the document, Procedures for the HCI Thesis.)
 - To do a thesis, students must test a hypothesis or answer research questions that lead to novel, generalizable knowledge; therefore constituting a contribution to the discipline of HCI.
 - What distinguishes the Masters thesis and the Ph.D. dissertation is that the doctoral dissertation must be "highly original" and produce a "substantial contribution" to the discipline of study. In the case of doctoral research, the student is posed with greater challenges and a much higher standard of scholarship.
 - Graduate students that are seriously considering obtaining a Ph.D. should consider writing a thesis, rather than doing a project.
- **Graduate Project:** Graduate research leading to a Master of Science HCI Project is a professional enterprise in applied research, the primary purpose of which is the advancement of best practice and applied knowledge within the discipline of human-computer interaction (HCI).
 - Applied research is designed to solve practical problems of the modern world, rather than to acquire new knowledge. Applied research can be exploratory, but often is descriptive.
 - Students interested in executing a project must design and implement a system that embodies a novel innovation that constitutes a contribution to HCI and demonstrate that the innovation really constitutes an improvement. For example, applied researchers may investigate ways to innovate database design for online e-commerce, or arrive at a solution of a particular interaction design problem with international Web sites, or improve the usability of a feature of a particular software program.
 - The focus of an HCI master's project is not basic research per se, but an original contribution to the applied aspects of the HCI discipline. Graduate students should carefully consider how they might make such a contribution to form the basis of a final project proposal.
 - Projects are NOT activities that surround the mere making and testing of existing or newly created interactive products. Rather, students must focus on the innovation of newly developed methods, tools, or interactive products that embody the application of HCI-centered principles and practices.

Thesis Primary Advisor / Mentoring

- The graduate student must select a Primary Advisor (PA) to supervise his/her final research and thesis by the end of the first year in the program. The PA will also act as chairperson of the student's thesis committee, unless otherwise determined by the PA and student. Selection of the PA is arrived at through discussions with the Program Director (PD) of the HCI Graduate Program to determine the best match between the student's research area/interests and the background of faculty members.
- The PA should have a primary or adjunct faculty appointment in the School of Informatics. In some

cases, a PA may be selected from faculty in another school at IUPUI or IUB. In other unusual cases, a professional who holds an industrial position in a related field may also serve as PA. If a person from industry is selected, they must hold a master's degree or higher degree in a discipline. In each case, selection of the PA must be approved by the PD.

Thesis Committee

The Thesis Committee (TC) must have at least three members, one of whom is the student's PA, who also serves as chairperson. By the completion of the extended thesis proposal (See Appendix B), the student and the PA must agree on the selection of two additional committee members. The persons selected must be knowledgeable in the student's research area. No more than one of the members selected should be from the School of Informatics (IUPUI or IUB). Also, a maximum of one person from industry may be on the student's committee and must hold a master's degree or higher. That individual must also have an appropriate background to assess the student's research and thesis. Finally, selecting committee members that are local to central Indiana may prove advantageous to the student because committee members may need to meet in person.

Responsibility of the Thesis PA

The Thesis PA will give direction to the student's research to fulfill the requirements for a Master's of Science in HCI. The thesis PA may also defer to other members of the TC, if their expertise can better direct the student through any problems. The thesis PA, usually acting as chair of the committee, will also take "responsibility" to setup meetings or any other forms of communication necessary to discuss the progress of the student's thesis research, including the final thesis defense and presentation. The PA will also oversee and approve the final version of the student's thesis.

Responsibility of the Thesis Committee Members

The other TC members will work with the chairperson to oversee the completion of the student's research thesis. Committee members must be accessible to the student in order to provide direction throughout the process. Upon agreeing to sit on the student's committee, an email confirming agreement should be sent to the student.

Selecting a Research Topic & Completing the Initial Proposal for Research

- In consultation with the PA, the graduate student must decide on an action plan suitable for completion of the graduate research and thesis. This will include the research topic and a detailed timeline for each phase of the research up to the date of submitting the bound thesis to the Associate Dean for Graduate Studies and Research.
- A research topic must be decided by the end of the student's second semester (or sooner) in the program. In rare cases, modification of the topic may occur at a later date, but students should do their best not to change topics due to the time constraints of completing the program within a two year period. Although part-time students are on a different time schedule, they should also not extend the length of deciding on a thesis topic any longer than necessary. Once the topic is agreed upon, an email must be sent to each party confirming the decision, i.e., the PA and PD.
- The selection of a research topic will occur through the following process:
 1. Each student, upon entering the HCI program, will receive a list of research topics, developed by the HCI faculty. The topics will consist of areas of research familiar to the HCI faculty. Other topic areas that have the potential to provide the student a novel area of research will be provided on request.
 2. Students may formulate their own research topic under that direction of the PD and PA. However, students are advised that their area of research must comply with the standards set by the HCI faculty regarding what constitutes research. This matter is discussed in more detail in

sections II and III below.

3. All students will submit their research topic by preparing and submitting to their thesis PA in written form, the One-Page Thesis Proposal (See Appendix A.) A title, subtitle, abstract, and research question and sub-questions or a main question leading to one or more hypotheses are required.
4. The one-page proposal (Appendix A) should be emailed to the PA to establish a record. A dialogue should continue between the student and PA until they agree on the final version of the thesis title, paragraph, and research questions. Once there is an agreement, the PA MUST send a letter of confirmation to the student so they can proceed with the more extended research proposal, as outlined by Appendix A.

Preparing the Extend Research Proposal

During the period between the end of the second semester and early third semester in the program, students must have their extended proposal completed (See Appendix B.) and submitted for approval by the PA and TC. The extended proposal should be approximately 1500-2000 words, not including the title page, abstract, contents, and references. To keep the document within this general limit, students will have to give considerable reflection to what exactly they want to investigate. Their writing style must be concise. This will not be the time for too many details, as in the thesis itself, but it must clarify exactly what the student wants to do. The sections of the proposal, as outlined in Appendix B, will include:

- I. Introduction (Purpose Statement)
- II. Background (extended literature review / theoretical underpinning)
- III. Methodology (research design, treatment, data analysis)

The thesis proposal, when completed, will serve as a framework for the first three sections of the student's final thesis. As the document develops, there will inevitably be modifications, but the primary structure of the thesis (up to the methods section) will be completed. The process of writing the proposal for research may take numerous iterations to receive approval by the PA. Nevertheless, the student will work together with the thesis PA to perfect and complete the proposal. Once the document is approved, it will be provided to the thesis committee for their response. However, the PA has the final authority to approve or reject the thesis research proposal.

II. THESIS COURSES – I694 (PARTS 1 AND 2)

Research Project Course

- Goals: The Final Graduate Thesis course is a two semester (6 credit hours) culminating activity for the Master of Science degree in Human-Computer Interaction. The course is called: I694 Thesis/Project. See Appendix E for the two-year plan for HCI graduate students.
- The courses will provide each student with opportunities for learning and development in relation to their thesis, as well as support the thesis process and make sure that it is completed on time and with the highest level of quality. Once students enter the class, they should already have or be extremely close to having and clear direction in their thesis research. This direction has much to do with how well they have communicated with their PA in initiating this direction.
- Attendance is mandatory for all students!
- Structure: The courses will be structured around activities and themes that are of major importance when planning, developing and completing the thesis. The courses will be divided into themes that we will work on for a few weeks. Most of the class work will be done through discussions, sometime in the whole class and sometimes in smaller groups. Students will learn to support one another within the research group in a variety of ways. Past experience has shown that active participation in these

discussions are crucial to thesis success.

- **Topics:** We will explore and examine the differences between doing research and design. As mentioned above, themes will address some specific aspect of design and research practice. We will explore how those differences manifest themselves in the practical thinking and planning of the thesis, how they can be transformed into choices of method, techniques and perspectives. We will also explore, examine and practice the art of creating and managing an HCI portfolio and resume. Specific topics covered include:
 - General topics covered:
 1. The creativity, ideation and framing of a thesis
 2. Finding inspiration and relevant research and literature
 3. Planning and managing the research process
 4. Dealing with their research team in the development process, e.g., data collection and analysis
 - We will focus on the thoughts and skills that cover:
 1. Practical issues in design and research processes
 2. Ethical issues and responsibilities
 3. How to abstract and generalize from empirical studies and experiments
 4. How to write the thesis
 5. How to prepare their defense
 - We will also briefly explore and discuss:
 1. Job searching
 2. Interviewing for jobs
 3. How to present a CV and a HCI portfolio

Thesis Course One (3 Cr.)

- The purpose of Thesis Course One is to begin the thesis work. At the initiation, students will meet with their PA to agree upon a timeline to complete their research and thesis.
- The student will be responsible for completing each stage according to this timeline. Failure to complete all the required portions of the thesis on time and according to a standard deemed appropriate for an HCI project will result in a reduce final grade.
- Finally, by the completion of Project One, the student must receive approval from the Institutional Review Boards (IRB) to be sure they are in compliance with federal regulations related to the use of human subjects. To receive approval by the end of Project One, students must submit their application to the IRB office as early in the semester as possible, i.e., no later than October 1. No study using human subjects can be performed until this approval arrives in paper form from the IRB office. The process of approval can take from 2 to 6 weeks, depending on the level of research (exempt or expedite) and the number of changes the IRB review board expects. Please see Appendix D for more details. Finally, by the completion of Thesis One, the student must receive approval from the Institutional Review Boards (IRB) to be sure they are in compliance with federal regulations related to the use of human subjects.

Thesis Course Two (3 Cr.)

- Upon completion of Thesis Course One, students will be allowed to register for Thesis Course Two. The same process of overseeing and assessing their step-by-step progress will take place. The primary purpose of Thesis Course Two will be to conduct the proposed research, if it has not been completed already. Also, it is to complete the thesis. The final thesis should consist of no more than 5 to 8,000 words, not including the front materials, table of contents, abstract, references, and appendices. If students feel a need to produce a longer thesis, they should remain in consultation with their PA as to the reason.

- The process will take the form of many activities, including testing participants and/or field work, data collection and analysis; and the completion of the thesis. This process will demand that the student stay in close communication with his or her PA because of the complexity of issues that may arise.

Intent to Graduate

The graduate student must file an "Intent to Graduate" form with the Recorder of the School of Informatics at least six months prior to graduation. In each step of completing the thesis, the student should remain in contact with the PD and their thesis PA to assure that all steps toward graduation are being taken in a timely fashion.

III. RESEARCH QUESTIONS AND HYPOTHESES

The first stage of graduate research, leading to thesis completion, is to determine the specific topic on which you will focus. From this point, the statement of purpose should set out the central direction for the research. Next, one or more clear and concise research questions or hypotheses must be formed. Questions and hypotheses provide a specific clarification of the statement of purpose. In either case, a comparison between two or more groups is made in terms of a dependent variable or as a relationship of two or more independent and dependent variables, and the significance of the relationship is evaluated.

Research Questions

Research questions are generally written into qualitative type studies. Research questions consist of a broad question followed by several related sub-questions. For example, studies consisting of ethnographic research would entail observing users interacting with some form of technology while collecting primarily narrative data. Based on the research question and the study, the student should arrive at some *approximation* of scientific truth¹. Ethnographic studies are a valid form of inquiry leading to findings that do not necessarily demand the rigor of inferential or descriptive statistics.

Research Hypotheses

Research hypotheses are generally written into quantitative studies; however, one may start the inquiry with a question. In master's theses or doctoral dissertations, advisors often recommend hypotheses, because they represent the classical form of raising questions. A hypothesis must be proved or disproved by an accepted experimental methodology. The study is expected to arrive at some approximation of scientific truth through these steps: 1) a comprehensive search of existing knowledge on the topic found through a literature review, 2) a rigorous and well-formulated methodology that provides sound logic for arriving at the intended results, 3) controlled observation, which includes a precise form of data collection, 4) verifiable results, including an appropriate form of statistical analysis of the data, and 5) discussion that summarizes the results relative to the originally stated hypotheses and the existing body of relevant knowledge on the subject².

IV. RESEARCH DESIGN

Research Design Basics

- Based on a given research hypothesis or program, students will devise a design for research. Research design provides the glue that holds the research together. A design is used to structure the way the research will be carried out. For example, it will show all of the major parts of the research: the sample group(s), measures, treatments or programs, and methods of assignment. Each part works together to arrive at addressing the central research question or hypothesis. All students must take one research design course in order to adequately carry out their research. A research design course

1 Often times, when quantitative data is collected in a study based on a research question, descriptive statistics are used to arrive at a measurable outcome to support this approximation. Descriptive statistics constitute a set of techniques to summarize, organize, and present quantitative data sets numerically in tables or visually in figures, charts, and graphs. Examples of descriptive statistics include frequencies; percentages; measures of central tendency, such as mean (average), mode (most frequent value), and median (middle value); measures of variability, such as the variance or its square root, the standard deviation, range (maximum and minimum), inter-quartile range, and absolute deviation; and measures of correlation, such as linear correlation or rank correlation. Data is first collected and classified. If classes are subjectively defined, it may be necessary to have more than one judge, and further statistics are required to show consistency in judgment. Data is then summarized in the above measures and presented numerically and visually. If measures of statistical significance, such as student's t-test or ANOVA, show that there is sufficient data to draw conclusions about the population from which the data is sampled, inferential statistics may also be applied.

2 In most every case, quantitative data is collected in a study based on a hypothesis, with inferential statistics being used to arrive at a measurable outcome to support the hypothesis. Inferential statistics are concerned with testing hypotheses on samples, with the hope that these hypotheses, if true of the sample, will be true and generalize to the population. The most common in inferential statistics test whether two different variables are related to each other through correlation and the Chi-Square test.

(I575 Informatics Research Design) is a required core course for all HCI students.

- It is also advantageous for students to understand the difference between basic and applied research and where their research falls. In most cases, HCI research falls within the applied category of research. However, there are some cases where an in-depth study is investigating the nature of some aspect of HCI that has no immediate application to technology per se. Basic research is driven by a scientist's interest (curiosity) in a scientific question or line of inquiry. The main motivation is to expand human knowledge. It is not to create or invent a product, i.e., there may not be any obvious commercial value to the discoveries.
- Basic research lays down the foundation for the applied research that follows. It is conducted without a practical end in mind although it can have unexpected results that point to practical applications. For example, basic science investigations probe for answers to questions such as how the earth was formed. A basic research question in HCI might be, what is a particular user groups' cognitive response to a given technology? Another example might be; when teenagers use online chat programs, do they change their behavior of communication or pattern of interaction?

A Cross between Basic and Applied Research

There are many instances when the distinction between basic and applied research is not clear. It is not unusual for researchers to present their work in such a light as to pigeon-hole it into either applied or basic research. Some say that the difference between basic and applied research lies in the time span between research and reasonably foreseeable practical applications. In the case of HCI, students should have a general idea of what type of research they are doing.

Ethnography: An Alternative to Statistical Validation

- If students decide to depend on ethnography or other forms of field work to obtain their thesis research findings, the process will demand a considerable degree of commitment to immersing oneself within a social context. Ethnographic approaches to IT research have been considered by HCI professionals since the early 1990's as a viable means of informing the system design process. The advent of this method for system design caused technologists to seriously consider the aspect of context regarding human-computer interaction (Nardi, 1996).
- Ethnography requires an explicit study of participants at a very early stage of the design process (Crabtree, Nichols, O'Brien, Rouncefield & Twidale, 2000). Ethnography is a form of exploratory fieldwork that includes: 1) immersive participatory observation, and 2) interpretative methods of analysis that are organized. The method is qualitative, with an emphasis on the informants/users/observer's experience.
- Interpretive research, done with ethnography, has historically been considered an invalid means to secure data while studying information systems. However, Hemmings and Crabtree (2002) state that the appeal of ethnography follows the recognition by designers that the development of software increasingly relies upon social circumstances. This suggests that formal performance testing may systematically deconstruct human action in the work place, but in so doing may obscure or misrepresent the empirical process within a particular socially organized environment; failing to give adequate attention to the social nature of work. On the other hand, the focus of ethnography is on "social practices which enable the very processes which analytic methods identify, but which they decontextualize" (Hughes, King, Rodden & Andersen, 1994, p. 430).

V. RECOMMENDATIONS FOR RESEARCH MODELS

Graduate students have the choice of either Experimental-based Research (ER) or Theory-based Research (TBR). In the first case, a thesis must be written based on empirical³ findings, and in the latter case an in-depth study resulting in an advanced and novel theory must be developed, expounded and proven. Both EBR and PBR are intended as an opportunity to learn how to perform graduate-level research with respect to an HCI-related problem.

Experimental-Based Research (ER)

ER seeks to answer specific questions or hypotheses as an outcome of a chosen research design. The work is an investigation of an original topic in HCI. The writing of a thesis requires the scholarly exposition and documentation of a problem. In some cases this may lead to a new solution to the problem and to original results. ER must be theoretically grounded, and therefore will require a literature review related to the chosen problem domain. The research should include an empirical study consisting of a given technology with human interaction, usually related to some aspect of human cognition or behavior. In most cases, ER would be related to basic research, with no immediate commercial application or outcome.

Theory-Based Research (TR)

TR also seeks to answer specific questions as an outcome of a chosen research design. The TR option enables graduate students to inquire a particular emerging theoretical area. The theoretical approaches of this research will be based on a considerable understanding of HCI past and contemporary theory, including its interpretation and application in a broad range of human-computer interaction contexts. In addition, the thesis should be approached from the perspective of HCI theoretical arguments, problems, solutions, propositions, and working models as might be applied to HCI research, teaching, and/or professional practice. The research methodology chosen might include a typical, but extensive literature review, including looking at past findings of empirical research. Students must not lose their focus of inquiring into the relationship and interaction between humans and technology.

VI. THESIS PREPARATION, DEFENSE, BINDING, AND SUBMISSION

Once the research is completed, the graduate student must prepare their thesis. See the Appendices for thesis organization and format, including the cover page for thesis committee signatures.

Thesis Editing and Proof Reading

- It is the responsibility of the student to submit a professional, written thesis to the committee. Neither the thesis PA nor any committee member is responsible for proof reading or to act as editor for the student. In many cases, graduate students hire professional editors to proof their theses for grammar, syntax, typographical errors, and general clarity and the logical flow of ideas.
- Students may take advantage of the IUPUI Writing Lab Center to assist them in the early stages of the preparation of their thesis. However, students must be advised that the Writing Lab should not be

³ Empirical research is any activity that uses direct or indirect observation as its test of reality. The empirical researcher attempts to describe accurately the interaction between his instrument and the entity being observed. The instrument may be as simple as the human eye or as complex as an online tracking system that measures user performance time. The researcher is expected to calibrate his/her instrument by applying it to known standard objects and documenting the results before applying it to unknown objects. In practice, the accumulation of evidence for or against any particular theory involves a detailed plan resulting in a research design for the collection of empirical data (Wikipedia).

used in lieu of a professional editor. The expense of hiring a professional editor will serve to produce a well written thesis. Students should consider the employment of a professional editor as a normal course expense.

- Students should also be advised that their thesis may be rejected based on a lack of professional execution, regardless of the quality and substance of the research. In other words, although the content of the thesis may meet a professional standard approved by the committee, if it lacks clarity, logic, and grammatical correctness, the thesis will be rejected and the student risks not meeting the deadlines set for graduation.

Thesis Review

The graduate student must submit their thesis to the thesis committee that was selected (once the individuals have agreed to serve on it) for review and approval. Typically, the thesis PA and the members of the committee will make suggestions for revising the thesis while the thesis is in the process of being written. The PA should walk the student through the outline and written form of the thesis to assure that the approach meets academic and professional standards. After changes are made by the committee to the thesis, a copy must be submitted to the Office of the Dean and/or the Graduate Program Director for review. (The thesis should not be in a bound state at this time.) When final changes are made and the thesis preparation is complete, the student is ready to defend their thesis.

The Oral Defense of the Thesis

- As a consummation of the research and thesis, all students must formally present and defend their thesis. After approval by the thesis committee, the graduate student sets up a time for thesis defense in the last semester of their graduate work. The graduate student will make an oral defense of the thesis to the committee at a public seminar with other interested attendees. The seminar will consist of two parts, an open and closed session. After the candidate has had an opportunity to discuss the research findings with the audience and the committee, general questions may be raised for the candidate to expound more specifically on particular problems, issues, or research related topics.
- Following the open session, the general public will be excused and the committee will have an opportunity to ask more specific and probing questions regarding the student's research. The closed session is necessary for the committee to make any final recommendations, enhancements or changes to the thesis before it is bound and handed in to the Dean's office before graduation.

Thesis Formatting Guidelines

- The thesis must adhere to the format provided on the HCI Thesis Web page: <http://informatics.iupui.edu/academics/hci/thesis/>
- In addition to the online Guide mentioned above, the thesis should be all in 12 point Times Roman font. All headings and subheads must follow the APA format. All use of citations within the document and references in the Reference section must adhere to the APA format. Past theses can be used to guide the preparation process. Students should contact their PA if they are unclear about thesis formatting.

Thesis Binding

Once the final changes have been made, the final thesis is signed by the committee members, and the thesis is ready for binding.

Students should contact National Library Bindery to get the exact prices of binding their thesis. (See Figure 2.) They should also be advised that the price increases based on the quickness of turn around required. One week is the normal turn around time for a thesis order to be completed, but discussing this with the management of the bindery is VERY important. Students should be warned that it is their

responsibility to get their thesis to the bindery on time in order to meet the deadline for submission to the Dean's office.

Thesis Bindery: National Library Bindery 55 South State Avenue, Indianapolis, IN 46201 (317) 636-5606

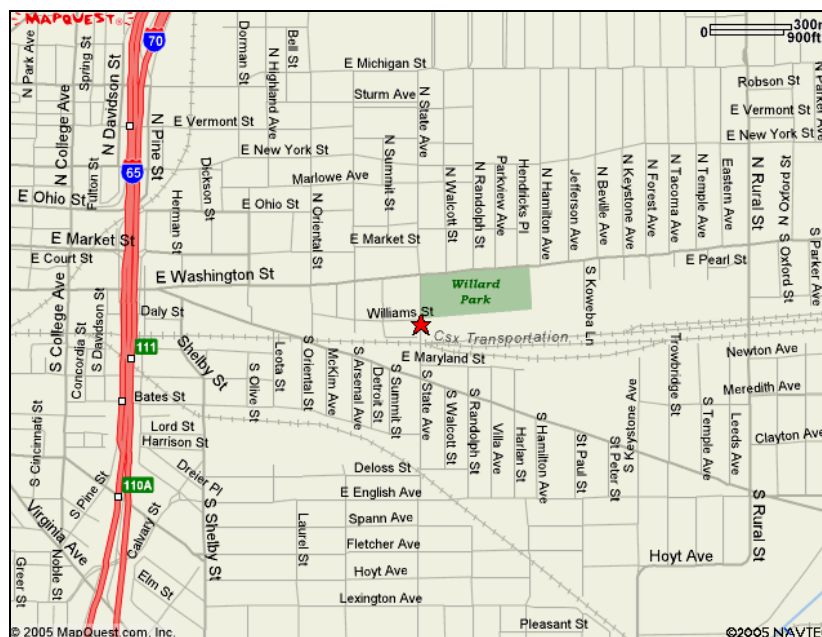


Figure 2. Map of the National Library Bindery

Note: This is a bindery company that the School of Informatics recommends, but you are not limited to it. You may use any bindery that you choose as long as they use the binding method approved by Indiana University. Thesis binding usually takes a week to a month.

Final Thesis Submission

1. Two bound copies are required. The student must submit one to the School of Informatics Associate Dean for Graduate Studies and Research and one to the graduate student's thesis PA. An additional bound copy may be desired for the student and/or the PD, but this is optional. All bound copies must be printed on 100% cotton rag paper, one-sided printing only. The final bound thesis must have the student's curriculum vitae included in the appendix. Unbound (e.g., coil bound) copies must also be distributed to the other members of the thesis committee.
2. Finally, a digital version of the thesis on **CD-ROM must** be submitted to the School of Informatics Dean's Office for posting online by the IUPUI University Library, along with a signed public permission (release) form.]
3. Once all materials are submitted, the Associate Dean for Graduate Studies and Research will notify the School Recorder. The School Recorder will process the graduate student's graduation if everything else is in order. For more information concerning this matter, please contact the Graduate Program Coordinator in the Office of Graduate Studies.
4. **NOTE: It is very important to know that graduation will NOT be approved until a BOUND copy of the student's thesis is delivered to the Associate Dean for Graduate Studies and Research in the School of Informatics.**

Appendix A
THESIS (ONE-PAGE) PROPOSAL

Student Name

John Xa Doe

Anticipated Graduation

(Month and Year)

December 2008

Research Title & Subtitle

Cross-cultural cognition:
An investigation of designer thinking on web site design

Thesis Proposal Abstract

(Max. 200 words, one paragraph)

Cross-cultural Web design and usability research takes as its theoretical underpinning cross-cultural communication, cultural anthropology, and cognitive science. The focus of research is to explore the cross-cultural design of online information and its impact on the social context of international users. Because empirical research continues to show evidence of cultural differences in cognition, the current study is intended to show how culture shapes the cognitive style of Web designers. Using subjects from diverse cultures, performance and preference measures will be collected online and off to identify designer cognitive styles and user preferences. The study will explore ways to measure culturally-mediated differences in how people think in different cultures when designing web sites, online information, or software.

Research Questions

(1-3 with sub-questions if necessary)

1. Does the cultural-context of Web designers determine how they design information for the web?
2. Do the cultural cognitive styles of Web designers, as reflected in the Web content they design, cause cross-cultural users to have higher degrees of performance?
3. Do the cultural cognitive styles of Web designers, as reflected in the Web content they design, cause cross-cultural users to have specific preferences toward Web sites created by designers from their own culture?

ADVISOR APPROVAL

Thesis Advisor / Chair

Signature

Date

Student Name

Signature

Date

Appendix B
THESIS (FULL) PROPOSAL

FORMAT FOR THE COVER PAGE

INDIANA UNIVERSITY SCHOOL OF INFORMATICS
Human-Computer Interaction Program
Graduate Thesis Proposal

Thesis Title
Thesis Subtitle

Student Name
Student Email

Date of Proposal Submission: _____

Date of Graduation: _____

SUPERVISORY COMMITTEE APPROVAL

Thesis Advisor / Chair Signature Date

Thesis Committee Member 2 Signature Date

Thesis Committee Member 3 Signature Date

STUDENT CONFIRMATION

Student Name Signature Date

THESIS RESEARCH PROPOSAL OUTLINE

CONTENTS

I. ABSTRACT

II. INTRODUCTION

- A. Introduction to subject (Brief background of the topic and the problem space.)
- B. Importance of subject (Why is the topic of your research valuable?)
- C. Intention of the study (Intended contribution to the HCI discipline.)

III. LITERATURE REVIEW

- A. History and related research of the topic

(A condensed literature review that will be expanded in the final thesis.)
- B. Research questions or hypotheses

(The literature review should naturally and logically lead the reader to the research question or hypothesis.)

IV. METHODOLOGY (Including the overall research design)

- A. Participants (Who and number of persons in the study)
- B. Treatment or Procedures (How the study will be carried out and the general description of the technology to be studied)
- C. Data Analysis (Type of data to be collected)
 - Method of data analysis

V. REFERENCES

VI. APPENDICES

This is the outline that **MUST** be adhered to for proposing your thesis research. Under each of the sections and subsections, students should provide the necessary information. In addition to the cover page, contents, and references, the proposal should range from 1500-2000 words (double-spaced, 12 pt.).

Appendix C FORMAT FOR FINAL THESIS

CONTENTS		Page
LIST OF TABLES	ERROR! BOOKMARK NOT DEFINED.	
LIST OF FIGURES	ERROR! BOOKMARK NOT DEFINED.	
ACKNOWLEDGEMENTS	ERROR! BOOKMARK NOT DEFINED.	
ABSTRACT	ERROR! BOOKMARK NOT DEFINED.	
Chapter One: INTRODUCTION & BACKGROUND	ERROR! BOOKMARK NOT DEFINED.	
Introduction to Subject	Error! Bookmark not defined.	
Importance of Subject	Error! Bookmark not defined.	
Related Research	Error! Bookmark not defined.	
Intended Focus	Error! Bookmark not defined.	
Chapter Two: LITERATURE REVIEW	ERROR! BOOKMARK NOT DEFINED.	
Introduction (Related research, Current practice or understanding)	Error! Bookmark not defined.	
Research Question(s) and/or Hypotheses	Error! Bookmark not defined.	
Chapter Three: METHODOLOGY (Research Design)	ERROR! BOOKMARK NOT DEFINED.	
Participants	Error! Bookmark not defined.	
Treatments	Error! Bookmark not defined.	
Procedures	Error! Bookmark not defined.	
Analysis	Error! Bookmark not defined.	
Chapter Four: RESULTS (Findings)	ERROR! BOOKMARK NOT DEFINED.	
Chapter Five: DISCUSSION	ERROR! BOOKMARK NOT DEFINED.	
Explanation of Outcomes	Error! Bookmark not defined.	
Implications of Results	Error! Bookmark not defined.	
Chapter Six: CONCLUSION	ERROR! BOOKMARK NOT DEFINED.	
Limitations of Study	Error! Bookmark not defined.	
Future Research	Error! Bookmark not defined.	
Summary	Error! Bookmark not defined.	
REFERENCES	ERROR! BOOKMARK NOT DEFINED.	
APPENDICES	ERROR! BOOKMARK NOT DEFINED.	
Appendix A:	Error! Bookmark not defined.	
Appendix B:	Error! Bookmark not defined.	
VITA	Error! Bookmark not defined.	

Appendix D

Institutional Review Boards (IRB) Approval

All research conducted at Indiana University-Purdue University Indianapolis (IUPUI) involving human subjects must be reviewed and approved by its respective campus research IRB risk review board. The boards review research plans and monitor ongoing research to insure full compliance with federal regulations and University policies. Protocol submission and requests for approval of research to each of these boards involve *separate procedures*. Therefore, it is important that the investigator initiate each procedure well in advance of any deadlines to allow adequate time for the review and approval process.

All HCI graduate students must be in IRB compliance by submitting the necessary applications to the IRB Advisory Board with enough time before beginning their research. Please see the IRB site, which has all necessary information and forms: http://www.iupui.edu/~resgrad/spon/rescom_human_menu.htm

See the Thesis/Project page for examples of IRB applications:
<http://informatics.iupui.edu/academics/hci/thesis/>

Appendix E

MASTER OF SCIENCE IN HCI Course Schedule & Plan of Study

FULL-TIME STUDENT - PLAN OF STUDY ³						
Semester	Year 1			Year 2		
FALL	Informatics Research Design (I575) ²	M - MacDorman	Introduction to Informatics (I501)	T - Perumal		
	Psychology of HCI ⁸ (I563) ^{1 & 2}	T - MacDorman	Prototyping for Interactive Systems (I564) ^{1 & 2}	W - Ough		
	HCI I (I541) ^{1 & 2}	R - Bolchini	Thesis or Project (I694)	Arr - Faculty		
SPRING	HCI II (I561) ^{1 & 2}	W - Bolchini	Thesis or Project (I694)	Arr - Faculty		
	Usability & Evaluative Methods (I543) ^{1 & 2}	R - Bolchini	Elective ⁴			
	Elective ⁴		Elective ^{4 9}			
SUMMER	As needed ⁷			Arr - Faculty		As needed ⁷
						Arr - Faculty

Elective Course Selection⁵

INFORMATICS COURSES

- I503 Social Impact of Information Technologies (3 credits)
- I505 Informatics Project Management (3 credits)
- I510 Data Acquisition and Lab Automation (3 credits)
- I512 Scientific Data Management (3 credits)
- I530 Seminar in Health Informatics Applications (3 credits)
- I534 Seminar in HCI (1-3 credits)
- I535 Clinical Information Systems (3 credits)
- I540 Data Mining for Security (3 credits)
- I550 Legal and Business Issues in Informatics (3 credits)
- I551 Independent Study in Health Informatics (1-3 credits)
- I552 Independent Study in Bioinformatics (1-3 credits)
- I554 Independent Study in HCI (1-3 credits)
- I604 HCI Design Theory (3 cr.)
- I624 Advanced Seminar I in HCI (3 cr.)
- I634 Advanced Seminar II in HCI (3 cr.)

MEDIA ARTS AND SCIENCE

- N500 Principles of Digital Arts Production (3 cr.)
- N502 Digital Media Motion and Simulation Methods (3 cr.)
- N503 Digital Media Application Design Processes (3 cr.)
- N504 Advanced Interactive Design Applications (3 cr.)
- N506 Media Arts and Technology Project (3 cr.)
- N510 Web Database Concepts (3 cr.)

PSYCHOLOGY

- PSY570 Industrial Psychology (3 cr.)
- PSY572 Organizational Psych (3 cr.)
- PSY601 Experimental Design (3 cr.)
- PSY615 Intro to Physiological Psychology (3 cr.)
- PSY640 Survey of Social Psychology I (3 cr.)
- PSY655 Cognitive Development (3 cr.)

COMPUTER SCIENCE

- CSCI 503 Operating Systems (3 cr.)
- CSCI 504 Concepts in Computer Organization (3 cr.)
- CSCI 506 MGMT of Software Develop. Process (3 cr.)
- CSCI 507 Object-Oriented Design and Program (3 cr.)
- CSCI 536 Data Comm. and Computer Networks (3 cr.)
- CSCI 537 Intro to Distributed Computing (3 cr.)
- CSCI 541 Database Systems (3 cr.)
- CSCI 550 Computer Graphics (3 cr.)
- CSCI 552 Adv Graphics and Visualization (3 cr.)
- CSCI 565 Programming Language (3 cr.)

DESIGN – HERRON SCHOOL OF ART & DESIGN

- HER-V501 Seminar: Intro to Design Thinking (1.5 cr.) ⁶
- HER-V502 Seminar: Intro to Human Factors in Design (1.5 cr.)
- HER-V511 Methods 1: People-Centered Design Research (3 cr.)
- HER-V521 Methods 2: Design Analysis (3 cr.)
- HER-V531 Methods 3: Design Synthesis (3 cr.)
- HER-V541 Methods 4: Design Evaluation (3 cr.)
- HER-R511 Studio: Designing Integrated Experiences 1 (3 cr.)
- HER-R512 Studio: Designing Integrated Experiences 2 (6 cr.)

OTHERS

- SLIS-S 532 Info Architecture for the Web (3 cr.)
- SOC-R551 Quantitative Methods - Sociology (3 cr.)
- STAT511 Statistical Methods 1 (3 cr.)
- STAT522 Sampling and Survey Techniques (3 cr.)
- STAT524 Applied Multivariate Analysis (3 cr.)

Note:

¹ Courses that are part of the HCI Certificate Program.

² Courses offered online.

³ This plan of study is only intended for full-time students. Part-Time students should take whatever courses are available each semester.

⁴ Select from Elective Course list. Students should also check each semester for new or other course offerings of interest.

⁵ Some elective courses may have prerequisites; so students should check with instructors before enrolling.

⁶ Graduate design courses at Herron are only offered during the day; as of right now.

⁷ Students may use the summer for a variety of purposes, e.g., preparation for their thesis or project research, elective courses, etc.

⁸ In the Fall semester, students may switch/swap Psychology of HCI for Introduction to Informatics.

⁹ Master's students may take I624 Advanced Seminar I in HCI (3 cr.) and I634 Advanced Seminar II in HCI (3 cr.) as an elective.

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