



## SCHOOL OF INFORMATICS

INDIANA UNIVERSITY  
IUPUI

Indiana University School of Informatics at IUPUI

Human–Computer Interaction Program

### **Request for a PhD Minor in Informatics, Human–Computer Interaction (HCI) Track**

*Approved by the HCI Program faculty on October 23, 2012*

*Approved by the School of Informatics Associate Dean for Research and Graduate Studies on November 6, 2012*

*Approved by the School of Informatics Interim Executive Associate Dean on November 6, 2012*

#### **1. Context and Rationale**

Human–computer interaction (HCI) can be broadly defined as “the discipline concerned with the *design, evaluation, and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them.*”<sup>1</sup> The School of Informatics currently offers a PhD in Informatics, Human–Computer Interaction track, with over 25 students currently enrolled, an average of 2–3 highly selective direct admits per year, and an average of 1–2 PhD students graduating per year. We recognize that knowledge of HCI is not only becoming increasingly relevant to other academic areas but also vital. Understanding the effective use, design, and evaluation of interactive technologies that focus on the needs and abilities of the users is crucial to the success and impact of a growing set of scientific and other knowledge domains ranging from engineering and computing to the life sciences. Future scholars should have the opportunity to learn some of the fundamentals of HCI to support and augment their research, discovery, and impact in their own discipline. To address this need, we see a great opportunity to complement the graduate studies of PhD students in other fields by offering a *PhD Minor in HCI*.

#### **2. Objectives and Expected Benefits**

The purpose of the PhD Minor in HCI Program is to enable current Indiana University and Purdue University doctoral students in other disciplines at IUPUI to learn, apply, and use human–computer interaction (HCI) theories, principles, and tools to address and study problems in their respective academic fields. The proposed minor will serve the needs of students of many schools at IUPUI, most notably, the Schools of Science (e.g., Department of Psychology, Department of Computer Science), Medicine, Nursing, and Engineering and Technology, by providing HCI theoretical and applied competence needed to augment their research endeavors. Having PhD students from other Schools taking coursework with Informatics/HCI students will also increase the cross-pollination of disciplinary and methodological approaches to solve research problems.

#### **3. Plan of Study**

The PhD Minor in HCI is a 12-credit hour program comprised of four (4) courses, each of which is 3 credit hours:

- Required courses: I541, I543, I563
- One additional course, selected from the following list, is required: I561, I564, I624, or I634.

Currently, most of the courses have online in addition to classroom sections; therefore, at the student’s discretion, the PhD Minor coursework may be completed entirely online in a minimum of one and a half years.

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<sup>1</sup> Hewett, T., Baecker, R., Card, S., Carey, T., Gasen, J., Mantei, M., Perlman, G., Strong, G., & Verplank, W. (1992). *ACM SIGCHI curricula for human–computer interaction*. New York: Association for Computing Machinery.



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### PHD MINOR IN HCI – SAMPLE PLAN OF STUDY

	Fall	Spring
Yr. 1	<ul style="list-style-type: none"><li>• <b>I541</b> HCI Design I [<u>Required</u>: in-class   online ]</li><li>• <b>I543</b> Usability &amp; Evaluative Methods [<u>Required</u>: in-class   online]</li></ul>	<ul style="list-style-type: none"><li>• <b>I561</b> HCI Design II [<u>Elect.</u>: in-class   online ] OR</li><li>• <b>I564</b> Prototyping for Interactive Systems [<u>Elect</u>: in-class   online] OR I624 in Fall Yr. 2</li></ul>
Yr. 2	<ul style="list-style-type: none"><li>• <b>I563</b> Psychology of HCI [<u>Required</u>: in-class   online ]</li><li>• <b>I624</b> HCI Advanced Seminar I [<u>Elect</u>: in-class only ]</li></ul>	Note: only <b>one</b> elective from among I561, I564 or I624 is necessary for the minor.

#### 4. Learning Outcomes

Students who successfully complete the PhD Minor in HCI will acquire the following core competences in HCI practice and research:

- Identify and explain HCI domain knowledge in both basic and applied research with considerable depth, including HCI theory and usability principles and practices:
  - HCI problem space definition and conceptual models
  - User-centered approaches to interaction design
  - User profiling and user needs and requirements
  - Interface design principles and processes, as well as related areas of visual design and aesthetics
  - Foundations of cognitive and information processing with user interfaces
  - Evaluation and testing methods for interactive products, related to usability and user experience goals
- Identify and apply HCI principles and practices during product design and evaluation (development and usability testing) of interactive products, including
  - Designing and prototyping interface designs and prototypes based on user and needs assessments
  - Validating design decisions through a user-centered approach to interaction design
  - Applying methods of analysis, evaluation, and usability testing to interactive products

#### 5. Grading Policy

A minimum of B (3.0) is required in each course that is to count toward the minor. If a minimum of B (3.0) is not earned in a course, that course must be retaken. A course may only be retaken *once*. Students who fail to achieve the minimum grade of B (3.0) the second time they take a course will not be able to earn the PhD minor.

#### 6. Plan for Sustaining Enrollment

In the first year (Fall 2013), up to 10 students are expected to participate in the program. It is anticipated that this number will rise to 15 per year in the next 3-to-5 years, as awareness of the program increases.

#### 7. Maximum Number of Transferable Credits

Applicants who have already earned credit for one or more of the equivalent courses from other institutions and other programs may request to apply up to a maximum of three credits of these courses toward the minor. Any waivers or substitutions have to be approved by the Minor Coordinator in consultation with the Graduate Committee of the HCI program. A maximum of three credits from another institution may be applied toward the Graduate Minor.



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### **8. New Resources**

No additional resources are needed. All courses are currently taught at IUPUI by existing faculty.

### **9. Proposed Date of the Initiation of the Minor Program**

The proposed date of implementation is Fall 2013, assuming all necessary approvals are met.

### **10. Admission Procedure and Implementation Plan**

Pending approval, the Human–Computer Interaction Program will begin accepting applications in Spring 2013, for Fall 2013 entry into the PhD Minor. The Department will inform the graduate program leaders of all IUPUI academic schools when the Minor is approved, and include information on internal application procedures and faculty contacts. Once applications are received, the School of Informatics Graduate Admission Coordinator, in concert with the HCI core faculty forming the Graduate Admission Committee will process them and notify applicants of their status. Once applicants are approved, the PhD Minor designation will be added to their student record so that it can be awarded upon completion. Students will be advised by core faculty of the HCI Program—as assigned in rotation by the Director of the HCI Program, who will serve as PhD Minor Advisor, in coordination (mediated by the student) with the student’s doctoral research advisor.

### **11. Procedures for Governing the Program including Construction of Committees that will Provide Oversight**

The Graduate Curriculum Committee of the HCI Program will oversee the program. Qualifying exam is not required for PhD Minor in HCI. All advising will be done by these faculty members. The School of Informatics and the graduate admissions coordinator will take responsibility for all record keeping and tracking of students.

### **12. Procedures for Program Evaluation including the Criteria for Success**

Upon completion of the minor program, exit interviews will be conducted for all students to determine the effectiveness of the program in meeting their needs and to identify how they are using the skills and tools learned in the program in their major areas of study. The program chair will coordinate with HCI core faculty in determining a set of questions composing the exit interview and will assign faculty members to conduct these interviews. Similarly structured follow-up interviews will be conducted after three and five years. Given the projected enrollment of this program, it is anticipated that most students will be tracked in this manner. Success of the program will be defined in terms of demand (enrollment) and the responses of the students surveyed upon completion of their degree and in the follow-up interviews. To ensure completion of this important, final aspect of the feedback loop—ensuring the ongoing quality of the minor program offering and soliciting insight for future improvements, the school recorder will place an administrative hold on the student’s record, pending notification from the program director that the interview has been completed.

### **13. Impact on Undergraduate and Graduate Programs**

It is anticipated that the graduate minor would have no impact on undergraduate programs. The minor would be an option for graduate students in many fields, and would increase their options for doctoral minors. It is anticipated that most students will originate from other academic schools.

### **14. Employment Possibilities for Graduates**

The HCI Graduate Minor will add value to the portfolio of doctorate recipients by increasing their



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theoretical and analytical HCI design and evaluation skills and allowing them to apply this knowledge to their specialization of study. It is expected that the minor program will be a popular option for students in the science, IT and engineering and will enhance their marketability for both academic and industry positions.



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### 15. Faculty Overseeing the PhD Minor in HCI

**Davide Bolchini, Ph.D.**

Assistant Professor and Director, Human–Computer Interaction Program

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Research Interests: human–computer interaction for web and mobile systems, ubiquitous computing and natural user interfaces, usability, user experience design, and evaluation methods.

**Anthony Faiola, MFA, Ph.D.**

Associate Professor and Executive Associate Dean

Email: [faiola@iupui.edu](mailto:faiola@iupui.edu) | Web page: <http://informatics.iupui.edu/people/anthony-faiola/>

Research interests: cultural cognition in human–computer interaction, information visualization design in healthcare settings, and activity-centered design.

**Karl MacDorman, Ph.D.**

Associate Professor

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Research interests: android science, uncanny valley, machine learning, social robotics, sensor motor representation, symbol grounding, and symbol emergence.

**Mark Pfaff, Ph.D.**

Assistant Professor

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Research interests: human factors, team cognition, and group psychology and decision making with interactive systems.

### 16. Affiliated Faculty

**Joseph Defazio, Ph.D.**

Associate Professor

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Research Interests: Instructional Design, Music and Audio Technology, Multimedia Design and Production, Interactive Media Design, Learning and Cognition, Serious Game and Simulation Design and Development.

**M. Pauline Baker, Ph.D.**

Associate Professor

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Research interests: visualization, interactive graphics and virtual reality, physical computing, and natural user interfaces.

**Edgar Huang, Ph.D.**

Associate Professor

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Research interests: healthcare new media marketing, new media education, youth news consumption, video streaming, copyright issues related to DVD ripping, media convergence, and usability and aesthetics of web design.