

## **612: Pervasive Interaction Design – Winter 2012**

### **Overview / Goals**

Computation is moving off of the desktop and into users' environments and onto their bodies. The field of Pervasive (aka Ubiquitous) Computing looks at how to design, build, and evaluate systems and applications in this emerging world of everywhere, always on, always connected devices. This world presents enormous opportunities as well as enormous challenges. The Pervasive Interaction Design (PIxD) course seeks to provide students with perspectives, techniques, and hands on experience that will allow them to engage with these increasingly important technologies.

### **Learning Goals**

After taking 612, students should be able to:

1. Use best practices to design, prototype, and evaluate pervasive computing applications.
2. Describe key themes and issues from the pervasive computing literature in terms of their impact on design.
3. Critique and defend design decisions for pervasive applications grounded in the HCI, CSCW, and Pervasive Computing literature.

## **712: Research Topics in Pervasive Computing**

Research in Pervasive Computing seeks to extend our knowledge about how to design, build, and evaluate pervasive computing systems that meet human needs. This course will survey literature from the fields of HCI and Ubiquitous/Pervasive Computing that address key topics in the area. In addition, novel research methods that have been developed and applied in pervasive computing will be studied and applied.

### **Learning Goals**

After taking 712, students should be able to:

1. Describe contemporary research topics in pervasive computing, including seminal work and open research questions.
2. Describe common human-centered methods used in pervasive computing research and apply one or more methods in a substantial research project.
3. Execute a project that advances knowledge on a research question of interest to the pervasive computing research community.

### **Textbook / Readings**

There is one required text for both 612 and 712:

Kuniavsky, M. 2010. Smart Things: Ubiquitous Computing User Experience Design. Morgan Kaufmann.

This book can be purchased at [local bookstores](#) as well as [online](#). In addition, you can access the book [electronically](#) if you [connect through the library](#).

Several other readings will be assigned, all of which can be accessed via CTools and/or publishers' sites. Many will be available through the [ACM digital library](#), which will also require that you [connect through the library](#).

In addition, you are encouraged to obtain a sketchbook. You will sketch regularly during the course and periodically turn your sketches in for review by the instructors. It is recommended that you purchase a sketchbook that is specifically dedicated to this course. I don't have any particular recommendations about what kind of sketchbook to get, as personal preferences vary (I prefer small ones for portability, but many people like to have more space to work with).

## **Syllabus / Details**

### **SI 612 (Pervasive Interaction Design) Assignments and Grading**

The primary activity in this course will be a design project, which will be carried out in groups of 4 or 5 students. This will be worth 80% of the final grade. There will be 5 milestones associated with the project, namely:

1. Concept Proposal (10%): Based on initial ideation, each group will produce three high level concepts, along with a sketch of a plan describing how each would be researched using formative methods and what the key design questions would be.
2. Formative Study Results & Design Proposal (20%): Based on the findings from a formative study to understand users' needs, and to develop empathy for the context of use, a more detailed design proposal for one of the initial concepts will be presented, along with a justification for the proposed direction and a detailed plan for carrying out the project.
3. Experience Prototyping Results & Design Refinement (10%): As an early step in the development of the selected design concept, user feedback will be sought using low-fidelity experience prototyping methods. Based on the findings from these studies, refinements to the initial design proposal will be presented.
4. Final Demo (15%): The final design will be presented as a live experiential demo, which will seek to document and "sell" the design to an imagined set of stakeholders.
5. Final Proposal & Video (25%): The final milestone will be a proposal for a "real" system based on your prototype and demo. To make your proposal persuasive, you must synthesize the insights

obtained from each phase of the project, including ideation, design refinements, needs finding results, evaluations, and final concept. The proposal will be accompanied by a short video showing the imagined interaction with the designed system.

In addition to the project, students will complete the following:

- Food for thought questions, sketches, and activities (10%): Each week, the instructor will assign 2-3 questions and/or other lightweight activities related to the week's readings that students will be required to address/complete. The form and means of submission will be specified with each assignment.
- Participation (10%): You are expected to contribute meaningfully to in-class exercises and discussions. The results of peer feedback will also contribute to this portion of your grade.

### **SI 712 (Research Topics) Assignments & Grading**

The primary activity for students in 712 will be a research project that results in a final paper. The project can be pursued in pairs or individually, and the expectations will be higher for pair projects than for individual projects (e.g., more literature reviewed, more study participants, more substantial technical work). Students will be responsible for forming their own project pairs in advance of the third class meeting, and pair work will be preferred to individual work so that more substantial projects can be tackled. The project will be worth 80% of the final grade and will unfold across 5 milestones:

1. Proposal (10%): an outline of a potential research project, including possible questions, literature sources, and methods.
2. Preliminary Lit Review (15%): 5-10 key articles will be identified and summarized that relate to the proposed work, with special attention paid to the open questions remaining from the prior work that will be addressed in the current project.
3. Initial Draft (15%): a first draft of the paper will be produced, focusing on the proposed contribution of the work, further development of the literature review, the study design and preliminary results, and anticipated limitations.
4. Poster (and Demo) (10%): The project will be presented during a final demo session, along with the demos from SI 612. If appropriate, the results of the project will be demonstrated. Whether or not a demo is appropriate, the results will be presented as a poster.
5. Final paper (30%): A final research paper will be submitted in the ACM conference paper format, not to exceed 10 pages. The goal for each paper will be to attain a quality that would be acceptable for submission to a venue that is deemed appropriate for each student.

In addition, each 712 student will be expected to complete the following:

- Lead discussion (10%): Each student will help lead discussion  $2m/n$  times ( $m$ =number of

discussion meetings, n=number of students). Discussions will be led in pairs. Included in leading discussion will be generating 2-3 food for thought questions, which will be addressed in writing by all other participants before the class meeting.

- Food for thought (10%): Each student will complete the food for thought questions and post their response to the course website in advance of each discussion section meeting.

### **Class Format and Meetings**

Students in both 612 and 712 will meet on Fridays from 1-4pm. During most class meetings, we will discuss the Methods and Perspectives readings for 612, carry out an in-class exercise relevant to the methods being discussed, and the instructor will lecture briefly to introduce the following week's readings and discussion topics. On weeks where a milestone is due for 612, the class meeting will be used for the presentation of milestones and discussion of student work.

In addition to the combined 612/712 meeting, the 712 students will meet separately with the instructor on Fridays from 10:30-11:30 to discuss the 712 readings.

### **Office Hours**

Mark Newman: Th 10:30-12:30 in 4380 North Quad.

Tao Dong: Mon 2:00 - 3:00 and by appointment in the GSI Room on 3rd floor North Quad.

### **Communication**

The course syllabus and schedule are hosted on this Google Site, which can be accessed via the course CTools site. The lecture slides will be made available via CTools, with links provided from the course schedule on the Google Site. Assignment descriptions and submissions will be handled via CTools. You are responsible for keeping up-to-date with the materials on CTools, as dates, assignment details, and lecture topics may change as the semester progresses. The instructors will broadcast announcements via the CTools email list whenever significant changes are made to the materials on the course site.

### **Academic Integrity**

All assignments in this course are clearly designated as "group" or "individual" assignments. For the sole individual assignment, all submitted work must be your own, original work. For each group assignment, all submitted work must be the original work of the group. Any excerpts from the work of others (e.g., books, articles, web pages) must be clearly identified as a quotation, and a proper citation provided. **You are expected to understand what plagiarism is and how to avoid it. If you are uncertain about what the boundaries are, you must educate yourself. [Plagiarism.org](http://Plagiarism.org) and [Purdue's Online Writing Lab](http://Purdue's Online Writing Lab) provide excellent materials that can help you avoid trouble in 622 and elsewhere.** Any violation of the

School's policy on Academic and Professional Integrity (stated in the Master's and Doctoral Student Handbooks) will result in severe penalties, which might range from failing an assignment, to failing a course, to being expelled from the program, at the discretion of the instructor and the Associate Dean for Academic Affairs.

**Accommodations for Students with Disabilities**

If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way we teach may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Office of Services for Students with Disabilities (SSD) to help us determine appropriate accommodations. SSD (734-763-3000; <http://www.umich.edu/sswd/>) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. I will treat any information you provide as private and confidential.

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