

B649: Ubiquitous Computing

Instructor: Kay Connelly,
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LH 301E

Office Hours: Mon. 2:15-3:15
Thu. 2:15-3:15

Location: Monday, 1-2:15 pm, LH115

Credits: 1 credit
(select students may take an additional
2 credit Y790 project)

Web Page: www.cs.indiana.edu/~connelly/b649.html

Overview

This is a reading and discussion course for graduate students in ubiquitous computing. The primary course objective is to provide a fast introduction into ubiquitous computing, with an emphasis on the research problems and current projects addressing those problems. Secondary goals are to give students experience with critical reading and presenting research to technical audiences.

This course is not a lecture course, but is a highly-interactive discussion of research papers. In order for this course to succeed, you must come to class having read the assignments and be prepared to discuss the material. You are required to read two papers for each class. You must turn in a paragraph commenting on each paper the night before the class meets. You are expected to attend class and participate in the discussions. You will make a 20 minute presentation on a paper twice during the semester, and help lead the discussions of those papers.

Grading

- **Paper comments (33%):** You will have 12 reading assignments. Each week's paper comments will be worth 3% of your final grade. You are allowed to drop the lowest grade, so the comments are worth a total of 33%.
- **Attendance and discussions (37%):** You will earn 1% for attending the first class. Each of the remaining 13 weeks of class will be worth 3% of your final grade for attendance and discussion. You are allowed to miss one class, so attendance is worth a total of 37%.
- **Presentations (30%):** Each presentation will be worth 15% of your final grade, for a total of 30%.

Paper Comments

Paper comments should be brief (approximately 1-2 paragraphs or 5-10 sentences long for each paper). If a specific question or topic is not specified for the paper the week before, the following format should be used: They should demonstrate that you have read and thought about the paper. *You are not to regurgitate the paper abstract!* You should take no more than 1 sentence to summarize the problem the paper is addressing and one sentence to summarize the approach. The bulk of the comments should be insights into the approach, questions you have, interesting applications not mentioned in the paper, interesting relations to other projects, etc... In other words, the comments should lead to productive discussions in class.

Comments are to be sent to me (connelly@indiana.edu) by midnight the night before the class. They should be plaintext emails with the following subject line:

B649 Week *n*

Where *n* is the week number as indicated in the reading list below. My mail program will automatically filter assignments, so please be careful to have the correct subject line.

Attendance and Discussions

You must sign the attendance sheet to receive credit. Full credit will automatically be given to all present students *unless the class discussion is not productive*. In such a case, I will start keeping track of how often each student participates and award grades based on actual contributions to the discussion.

Presentations

The presentations serve not only to guide the class discussion, but to give you experience in presenting technical work to your peers. As such, the presentations should be professional. In general, they should include a title slide, an outline, the key technical slides, a summary and discussion slides (related work is optional). The bulk of the presentation is to give an overview of the work and therefore comes directly from the paper. In the discussion slides, however, you are expected to analyze the work and pose questions that will lead to meaningful class discussion. Presentations should last no more than 20 minutes, so be prepared to skip portions of your presentation if questions from the class slow you down. A good rule of thumb is to allow 2 minutes per slide... so no more than 10 slides.

Readings

While there are 15 weeks of classes, we will only have readings for 12 weeks (the first week is a lecture providing an overview of UbiComp and the course, there will be no class on October 13th, and the last week we will get project reports from those students taking the 2-credit project option).

- Week 1 (September 8): **Security and Privacy**
 1. *The Computer for the 21st Century* by Weiser in Scientific American
 2. *Workshop on Security in Ubiquitous Computing UBICOMP2002* summary of workshop in UbiComp '02
- Week 2 (September 15): **Location**
 3. *Wireless Geolocation Systems and Services*
 4. *RADAR: An In-Building RF-based User Location and Tracking System* by Bahl and Padmanabhan in INFOCOM
- Week 3 (September 22): **Location**
 5. *The Cricket Location-Support System* by Priyantha, Chakraborty and Balakrishnan in MobiCom '00
 6. *The Anatomy of a Context-Aware Application* by Harter et al. in Mobile Computing and Networking, 1999
- Week 4 (September 29): **Identification and Authentication**
 7. *A Flexible, Privacy-Preserving Authentication Framework for Ubiquitous Computing Environments* by Al-Muhtadi et al. ICDCSW'02
 8. *The Resurrecting Duckling: Security Issues for Ad-hoc Wireless Networks* by Stajano and Anderson in Proceedings of the 7th International Workshop of Security Protocols, 1999
- Week 5 (October 6): **Sensors and Devices**
 9. *Next Century Challenges: Mobile Networking for "Smart Dust"*, by Kahn, Katz and Pister in MobiCom '99
 10. *ForSe FIElds' – Force Sensors for Interactive Environments* by McElligott et al. in UbiComp '02
- October 13: **NO CLASS**
- Week 6 (October 20): **Sensors and Devices**
 11. *From Informing to Remembering: Ubiquitous Systems in Interactive Museums* by Fleck et al. in Pervasive Computing April-June 2002.
 12. *Issues in Personalizing Shared Ubiquitous Devices* by Tevor, Hilbert and Schilit in UbiComp '02
- Week 7 (October 27)[⊕]: **Smart Environments**
 13. *A Middleware Infrastructure for Active Spaces* by Roman et al in Pervasive Computing Oct-Dec 2002.
 14. *Project Aura: Toward Distraction-Free Pervasive Computing* by Garlan et al in Pervasive Computing April-June 2002.
- Week 8 (November 3)[⊕]: **Smart Environments**
 15. *The Interactive Workspaces Project: Experiences with Ubiquitous Computing Rooms* by Johanson, Fox and Winograd al in Pervasive Computing April-June 2002.
 16. *EasyLiving: Technologies for Intelligent Environments* by Brumitt et al.
- Week 9 (November 10)[⊕]: **Context**
 17. *The Context Toolkit: Aiding the Development of Context-Enabled Applications* by Salber, Dey and Abowd in CHI'99.
 - 18.
- Week 10 (November 17)[⊕]: **Context**
 - 19.
 - 20.
- Week 11 (November 24)[⊕]: **Applications**
 21. *Mobile Reality: A PDA-Based Multimodal Framework Synchronizing a Hybrid Tracking Solution with 3D Graphics and Location-Sensitive Speech Interaction* by Goose, Wanning and Schneider in UbiComp '02
 - 22.
- Week 12 (December 1)[⊕]: **Applications and Evaluation**
 - 23.
 24. *User Study Techniques in the Design and Evaluation of a UbiComp Environment* by Consolvo, Arnstein and Franza in UbiComp '02
- Week 13 (December 8): **Projects/Summary**
<NO READINGS>

[⊕] Readings for weeks 7-12 may change depending on the papers presented at the UbiComp '03 conference in mid October.