PUI

Instructor: Vassilis Kostakos **Classroom: Tu:2, Th:11**
Office: 2.91 **Classes: Tu-Th 14:00 - 16:00**
Office hours: By appointment

Course overview

This course is a combination programming course and design studio, and is for those who want to express their interactive ideas in working prototypes. Students will learn how to use programming languages, how to design and implement effective GUI interfaces, and how to perform rapid, effective iterative user tests. The course will cover several prototyping tools and require a number of prototypes to be constructed in each. These will range from animated mock- ups through fully functional programs. The course will also cover usability testing of interactive prototypes. This course is intended for HCII Masters students who come to CMU with a minimal, but competent programming background. It is also appropriate for CMU HCI undergraduate "second majors" in HCII who have had an introductory programming course. Because this course has a design studio component, class attendance is mandatory.

The course is project-based; the assignments all require implementing an interface in a prototyping system, iteratively testing that interface with real users, and then modifying the interface based on what you find. Some class sessions will be design reviews where students present their findings/modifications based on the user testing data. The students taking this course will often not be professional programmers, but will probably need to interact with programmers, and need to:

- Learn to express yourself in executable form
- Learn the basics of what is hard and easy to rapidly prototype
- Learn the basic terminology and approaches used by programmers, so you can work with them
- Experience the frustration and joy of programming a working prototype
- Design and conduct informal user tests of prototypes to find flaws with your interfaces

Prerequisites

Proficiency in a programming language such as C, programming methodology and style, problem analysis, program structure, algorithm analysis, data abstraction, and dynamic data. Normally met through an introductory course in programming in C, C++, Pascal or JAVA, such as: 15100 or 15112 or 15127 or equivalent.

Pragmatically, the requirement can be defined as "can successfully write a 300 line program in a 48 hour period." If you cannot complete the first assignment on time, I take that as evidence that you do not have adequate pre-requisites for the course.

Textbooks

There are two books required for this course:

- Jakob Nielsen. "Usability Engineering". Boston: Academic Press, Inc. 1993. 0-12-518406-9 (paperback) or ISBN 0-12-518405-0 (hardcover)
- Donald A. Norman, "The Design of Everyday Things". New edition: Basic Books, 2002, ISDN 0-465-06710-7. Or original edition (paperback): New York: Doubleday, 1988. ISBN 0-385-26774-6

Grading and exams

The individual components of this course will be weighted as follows:

- Participation (in-class & online) 5%
- Assignment 1 5%
- Assignment 2 10%
- Assignment 3 10%
- Assignment 4 10%
- Assignment 5 10%
- Assignment 6 5%
- Assignment 7 15%
- Midterm 10%
- Final 20%

Classroom and online participation

There will be material covered in class that is not available in the readings, so attendance at all lectures is mandatory. After 2 unexcused absences, each unexcused absence will result in a 1/3rd of a letter grade penalty on the semester grade, so show up to class, or let me know beforehand why you won't be in!

You are expected to actively participate in classroom discussion by asking questions, answering questions, and in general making comment where appropriate. In addition, you are expected to have an active online participation by commenting on other students' critique and questions. Your participation will be assessed on the quality of your comments and their frequency.

Late policy, incompletes, and missed tests

Homework is due before class on the assigned day (submission via email to the instructor's email address). Starting immediately at the start of the class when an assignment is due, a full grade will be deducted, followed by another full grade for each class period late.

It is the policy of this class not to give incompletes. All of the assignments end with an in-class presentation of your work, so you will need to have each one finished on time. Note that the course load is designed to be quite uniform during the term, since there is no big project at the end.

Make up tests will not ordinarily be given. If you know you are going to have to miss a test for valid reasons, discuss it with me and you can take the test early. If you miss a test due to a medical emergency, you must notify me before the exam.

Schedule

Date	Topic	Readings	Assignments
Tu 10 Feb	Course Introduction: Why are interfaces important, and why are they hard to design and implement?	Nielsen: Chapters 1 and 2 Brad A. Myers. "Challenges of HCI Design and Implementation ," ACM Interactions. vol. 1, no. 1. January, 1994. pp. 73-83.	
Th 12 Feb	What is design?	Norman: All chapters	#0 assigned
Tu 17 Feb	Flex Tutorial Room: TBD		#1 assigned
Th 19 Feb	Flex Tutorial Room: TBD		
Tu 24 Feb	NO CLASS		
Th 26 Feb	Usability engineering design process	Nielsen: Chapter 4 John D. Gould and Clayton Lewis. "Designing for usability: key principles and what designers think," Communications of the ACM. Volume 28 , Issue 3 (March 1985), pp. 300 - 311. Jakob Nielsen. "Alertbox: Durability of Usability Guidelines", Jan. 17, 2005.	
Tu 3 Mar	Who, what, when, why and how of prototyping	Marc Rettig, "Prototyping for tiny fingers", Communications of the ACM, Volume 37 , Issue 4 (April 1994), Pages: 21 - 27. Pedro Szekely, "User interface prototypes: tools and techniques", ICSE Workshop on SE-HCI, 1994, Pages: 76 - 92. Recommended Readings: Dirk Baumer, Walter R. Bischofberger, Horst Lichter and Heinz Zullighoven. "User interface prototyping -- concepts, tools, and experience," International Conference on Software Engineering, 1996, pages 532 - 541. Scott Berkunn. "Issue #12: The Art of UI Prototyping " November 2000.	#1 due #2a assigned
Th 5 Mar	In-class paper prototyping exercise		#0 due

Date	Topic	Readings	Assignments
Tu 10 Mar	Organization of user interface software	Brad A. Myers. "User Interface Software Tools," ACM Transactions on Computer-Human Interaction. vol. 2, no. 1, March, 1995. pp. 64-103. ACM DL Reference Brad A. Myers. "A Brief History of Human Computer Interaction Technology." ACM interactions. Vol. 5, no. 2, March, 1998.	
Th 12 Mar	Presentation of Assignment #0		#2a due #2b assigned
Tu 17 Mar	Debugging		
Th 19 Mar	Output	Nielsen: Chapter 3	#2b due #3 assigned
Tu 24 Mar	Input	Nielsen: Chapter 5	
Th 26 Mar	Interaction techniques		#3 (prelim.) due #4 assigned
Tu 31 Mar	Review for midterm		
Th 2 Apr	MIDTERM		
Tu 7 Apr	NO CLASS		
Th 9 Apr	NO CLASS		
Tu 14 Apr	Presentation of Assignment #3		#3 due #4 (prelim.) due
Th 16 Apr	Midterm and UARS		
Tu 21 Apr	Finite state machines		#5 assigned
Th 23 Apr	Properties of people		#6 assigned
Tu 28 Apr	International design	Nielsen: Chapter 9	#5 due
Th 30 Apr	NO CLASS		
Tu 5 May	Presentation of Assignment #4 and #5		#4 due #7 assigned
Th 7 May	Animation, sound and time		#6 due #7 (idea) due

Date	Topic	Readings	Assignments
Tu 12 May	Context-aware computing	Bill N. Schilit, Norman Adams and Roy Want. "Context-Aware Computing Applications", Workshop on Mobile Computing Systems and Applications, 1994, pp. 85-90.	
Th 14 May	Review for Final		
Tu 19 May	Presentation of Assignment #7		#7 (software & 1 page) due
Th 21 May	NO CLASS		
Tu 26 May			#7 (report) due
TBD	Final exam		

Extra reading material

The following papers may be found via the ACM Portal (http://portal.acm.org) or Google Scholar (http://scholar.google.com)

- Agar, M. H.. (1996). The professional stranger: An informal introduction to ethnography, 2nd ed.. San Diego,CA: Academic Press.
- Barley, S., Meyer, G., & Gash, D. (1998). Cultures of culture: Academics, practitioners, and the pragmatics of normative control. Administrative Science Quarterly, 33, 24-60.
- Baron, R. M. & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality & Social Psychology, 51, 1173-1182.
- Cambell, D. T. & Stanley, J. C. (1966.) Experimental and quasi-experimental designs for research. Boston: Houghton Mifflin Co.
- Cook, T. D., & Campbell, D. T. (1979). Quasi-experimentation: Design and analysis issues. Chicago: Rand McNally.
- Cronbach, L.J. (1982) Issues in planning evaluations: Designing evaluations of education and social programs. Or Designing Evaluations of Educational and Social Programs (A Joint Publication in the Jossey-Bass Series in Social and Behavioral Science & in Higher) Both out of print but in many libraries.

- Dabbs, J. M. Jr. & Ruback, R. B. (1987). Dimensions of group process: Amount and structure of vocal interaction. In Advances in experimental social psychology (pp. 123-169). NY: Academic Press.
- Dillman, D.A. (1999) Mail and Internet surveys : The tailored design method. 2nd. Ed. NY: John Wiley.
- Dubrovsky, V. J., Kiesler, S., & Sethna, B. N. (1991). The equalization phenomenon: Status effects in computer-mediated and face-to-face decision making groups. Human Computer Interaction, 6, 119-146.
- Fitz-Gibbon, C. T., & Morris, L. L. (1987). How to design a program evaluation. Newbury Park, CA: Sage.
- Geertz, C. (1973). Deep play: Notes on the Balinese cockfight. The interpretation of cultures. Basic Books. pp. 142-153.
- Grinter, R. E., Herbsleb, J. D., & Perry, D. E. (1999). The geography of coordination: Dealing with distance in R&D work. Proceedings of SIGGROUP Conference on Supporting Group Work (pp. 306 – 315). GROUP '99. Phoenix, AZ. New York: ACM Press.
- Hackman, J. R. (1985). Doing research that makes a difference. In E. Lwaler III, A. Mohrman, S. Mohrman, G. Ledford, T. Cummings, and Associates (Ed.). Doing Research That Is Useful for Theory and Practice. New York: Rowman and Littlefield.
- Herbsleb, J. D., Mockus, A., Finholt, T. A., & Grinter, R. (2000). Distance, dependencies, and delay in a global collaboration. CSCW 2000 (pp. 319-328). Philadelphia, PA. NY: ACM Press.
- Herlocker, J, Konstan, J., Terveen, L., and Riedl, J. (2004) Evaluating collaborative filtering recommender systems. ACM Transactions on Information Systems, 22, 5-53.
- Holsti, O. R. (1969). Content analysis for the social sciences and humanities. Reading, MA: Addison-Wesley.
- Joint Committee on Standards for Educational Evaluation (1981). Standards for evaluation of educational programs, projects, and materials. NY: McGraw Hill.
- Kenny, D. A. et al. (2002). The statistical analysis of data from small groups. Journal of Personality and Social Psychology, 83, 126-137.
- LeCompte, M. D., & Goetz, J. (1982). Problems of reliability and validity in ethnographic research. Review of Educational Research, 52, 31-60.
- Magidson, J. (1982). Some common pitfalls in causal analysis of categorical data. Journal of Marketing, XIX, 461-471.
- Maurer, T. J., Palmer, J. K., & Ashe, D. K. (1993). Diaries, checklists, evaluations, and contrast effects in measurement of behavior. Journal of Applied Psychology, 78, 226-231.
- McGrath, J. E. (1984). Groups: Interaction and performance. Englewood Cliffs, NJ. Prentice Hall.

- Mosely, J. B., O'Malley, K., Petersen, N. J., Menke, T. J., Brody, B. A., Kuykendall, D. H., Hollingsworth, J. C., Ashton, C. M., & Wray, N. P. (2002). A controlled trial of arthroscopic surgery for osteoarthritis of the knee. The New England Journal of Medicine, 347, 81-88.
- Redelmeier, D. A., & Tibshirani , R. J., (1997, Feb 13.). Association between cellular-telephone calls and motor vehicle collisions. The New England Journal of Medicine, 336, No. 7.
- Rosnow, R. L., & Rosenthal, R. (1995). Some things you learn aren't so: Cohen's paradox, Asch's paradigm, and the interpretation of interaction. Psychological Science, 6, 3 - 9.
- Rossi, P. H., & Freeman, H. E. (1993). Evaluation: A systematic approach (5th ed.). Newbury Park, CA: Sage.
- Salvucci, D. D. & Anderson, J. R. (2001). Automated eye-movement protocol analysis. Human-Computer Interaction, 16, 39-86.
- Sarter, M., Berntson, G. G., Cacioppo, J. T. (1996). Brain imaging and cognitive neuroscience: Toward strong inference in attributing function to structure. American Psychologist, 51, 13-21.
- Sternberg, R. J. (1994). The psychologist's companion. Cambridge: Cambridge U. Press.
- Strunk, Jr. W. & White, E. B. (2000) The elements of style. 4th Ed NY: Allyn & Bacon.
- Waterton, J. J. & Duffy, J. C. (1984). A comparison of computer interviewing techniques and traditional methods in the collection of self-report alcohol consumption data in a field study. International Statistical Review, 52, 173-182.
- Webb, E. J., Campbell, D. T., Schwartz, R. D., & Sechrest, L. (1966). Unobtrusive measures: Nonreactive research in the social sciences. Chicago: Rand McNally. Reprinted as Sage Special Classics, 2. 1999.
- Winer, B. J. & Michels, K. M. (1991) Statistical principles in experimental design. 3rd Ed. NY: McGraw Hill.
- Setlock, L., & Fussell, S. (2004). Taking it out of context: Collaborating within and across cultures in face-to-face settings and via instant messaging. Proceedings of CSCW 2004.

Resources

Forum

http://hci.dme.uma.pt/forums

Syllabus

http://hci.dme.uma.pt/courses/pui

Instructor email

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