

Cosc411 Advanced Topics in Human-Computer Interaction

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2012

Overview

Human-Computer Interaction (HCI) is concerned with the design, evaluation, and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them. It is an extremely active and broad-ranging research area, with contributions varying from inventive systems that demonstrate new ways of interacting with computers through to the use of formal methods for specifying interface behaviour. This course investigates current research topics in HCI, with a focus on the methods that are used to evaluate user interfaces. Recent research papers in the area will be reviewed.

Students will carry out a small research project in an HCI topic. Their project will be presented in the form of a paper suitable for submission to a research conference.

Materials for the course will be made available on learn.canterbury.ac.nz

Synopsis

This course is intended for honours and graduate students, researchers, and practitioners interested in Human-Computer Interaction.

- Major areas will be introduced by the lecturer.
- For each area, students will be assigned readings, and the readings will be discussed in class. Students must submit short written reviews of all assigned readings.
- Each student will choose a research topic that involves the following:
 - Background research on the area.
 - The design, implementation, and **evaluation** of a user interface.
 - A comprehensive written report.

Topics

The course will familiarise students with the state and scope of HCI research, with emphasis on the methods used to evaluate user interfaces.

Texts

There is no official course text, but the following are useful sources.

1. Proceedings of the Annual ACM “CHI” Conferences on Human Factors in Computing Systems. Several of these are available in the Physical Sciences Library. They are also available on the ACM Digital Library www.acm.org/dl/

2. Selected readings will be handed out during the course.
3. R. M. Baecker, J. Grudin, W. A. S. Buxton, S. Greenberg. Readings in Human-Computer Interaction: Towards the Year 2000. Morgan-Kaufman, 1995.
4. The |Stat Handbook (Perlman 1986)

Assessment Summary

Review of selected paper(s) and participation (10%).

You will write short critical reviews of several papers assigned by the instructor. Reviews should be approximately 300 words. The reviews must be mailed to **andy** by 5pm the day *before* the lecture in which the paper is discussed (the second lecture in each week shown in the timetable below). A template for the reviews is available under the 'Course readings' link of the COSC411 page on learn.canterbury.ac.nz

Andy will post a quantitative summary of students' reviews on the class web page. Failure to submit reviews in time will result in penalties under the 'participation' assessment category. You will also participate in class discussion on these papers.

Issues that you may wish to note in your written review include the following:

- What is the main contribution of the paper?
- What is its significance?
- What was the methodology and what other methodologies might have been appropriate?
- Are the findings valid and what are the threats to validity?
- Are the implications of the findings adequately and accurately discussed?

Note: all students should allocate between 1.5 and two hours reading time for each paper discussed in the class. All students should come prepared with questions and observations relating to the paper.

Research Project (50%).

You will decide on a research topic, in consultation with Andy, early in the course. The topic should involve conducting an evaluation of a user interface or measurement of some aspect of interaction.

The project is evaluated by the quality of a 6 page conference style paper (not more than 3500 words) that describes the work. The hardcopy paper and PDF email attachment must be submitted to Andy before 5pm Monday 14 May.

You should allocate 3–4 hours per week to your project.

Test (40%)

You will be examined on all of the material covered in the course (including the readings). The exam is open book. The date and time of the test will be announced later.

Tentative Lecture and Topic Schedule

Week	Topic	Readings
20 Feb (1)	Introduction & Overview.	
27 Feb (2)	Observational techniques.	(Greenberg & Buxton 2008)
5 March (3)	Experimental method, T-Test.	(Sambasivan et al. 2011)
12 March (4)	Fitts' Law, Correlation, Regression	(Shinohara et al. 2011)
19 March (5)	Multiple comparisons with ANOVA	(Harrison et al. 2011)
26 March (6)	Multi-factor experiments	(Nacke et al. 2011)
23 April (7)	Non-parametric tests	(Nancel et al. 2011)
30 April (8)	Review & revision	(Cockburn et al. 2012)

References

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- Greenberg, S. & Buxton, B. (2008), Usability evaluation considered harmful (some of the time), *in* 'CHI '08: Proceeding of the twenty-sixth annual SIGCHI conference on Human factors in computing systems', ACM, New York, NY, USA, pp. 111–120.
- Harrison, C., Hsieh, G., Willis, K. D., Forlizzi, J. & Hudson, S. E. (2011), Kineticons: using iconographic motion in graphical user interface design, *in* 'Proceedings of the 2011 annual conference on Human factors in computing systems', CHI '11, ACM, New York, NY, USA, pp. 1999–2008.
- Nacke, L. E., Kalyn, M., Lough, C. & Mandryk, R. L. (2011), Biofeedback game design: using direct and indirect physiological control to enhance game interaction, *in* 'Proceedings of the 2011 annual conference on Human factors in computing systems', CHI '11, ACM, New York, NY, USA, pp. 103–112.
- Nancel, M., Wagner, J., Pietriga, E., Chapuis, O. & Mackay, W. (2011), Mid-air pan-and-zoom on wall-sized displays, *in* 'Proceedings of the 2011 annual conference on Human factors in computing systems', CHI '11, ACM, New York, NY, USA, pp. 177–186.
- Perlman, G. (1986), *The |STAT Handbook: Data Analysis Programs on Unix and MSDOS*.
- Sambasivan, N., Weber, J. & Cutrell, E. (2011), Designing a phone broadcasting system for urban sex workers in india, *in* 'Proceedings of the 2011 annual conference on Human factors in computing systems', CHI '11, ACM, New York, NY, USA, pp. 267–276.
- Shinohara, K. & Wobbrock, J. O. (2011), In the shadow of misperception: assistive technology use and social interactions, *in* 'Proceedings of the 2011 annual conference on Human factors in computing systems', CHI '11, ACM, New York, NY, USA, pp. 705–714.