Understanding People: A Course on Qualitative and Quantitative HCI Research Methods

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CHI'17 Extended Abstracts, May 06-11, 2017, Denver, CO, USA
ACM 978-1-4503-4656-6/17/05.
http://dx.doi.org/10.1145/3027063.3027103

Abstract
This course will provide an introduction to methods used in Human-Computer Interaction (HCI) research. An equal focus will be given to both the quantitative and qualitative research traditions used to understand people and interactional contexts. We shall discuss these major research traditions along with their contemporary framings (e.g., in-the-wild research and Interaction Science). By the end of the course attendees will have a detailed understanding of how to select and apply methods to address a range of problems that are of concern to contemporary HCI researchers.

Author Keywords
HCI research methods; quantitative; qualitative; empirical research

ACM Classification Keywords
H.5.0. Information interfaces and presentation (e.g., HCI): general; H.5.2 User Interfaces: evaluation/methodology.

Introduction
People use interactive devices to support an ever-increasing variety of daily activities. In order to develop

a detailed understanding of how we use and interact with our device eco-system, Human-Computer Interaction (HCI) research makes use of a diverse set of methods and approaches [9,10].

In this course we give an overview of research methods that are commonly used to understand how people interact with technology systems. We will do this in a way that is both accessible to those unfamiliar with these methods and informative to attendees seeking to refresh their knowledge.

To understand the interactions that people have with technology a variety of research approaches can be used. Each approach has strengths and limitations that will be enhanced or exacerbated by the questions being researched and the context in which work is occurring. It is therefore vital to first understand the core philosophical and technical principles that underpin a particular research approach. The strengths of a quantitative research approach [8] are different to the strengths of a qualitative research approach [1]. The benefits that field studies bring to validity are tempered by the difficulties that arise when trying to control confounding factors outside the lab [10]. Appreciating these nuances is critical for understanding how to plan, conduct, and evaluate a successful HCI research project.

The course will be run by a group of leading HCI researchers and educators from the UCL Interaction Centre (UCLIC, http://www.ucl.ac.uk/uclic/) [7]. The organizers have extensive first-hand experience of conducting quantitative and qualitative HCI research, both in-the-lab and in-the-wild. They also run a well established and highly regarded MSc and PhD program in HCI, which produces the HCI researchers and practitioners of tomorrow.

The course builds on two previously successful and well attended research methods courses that ran at CHI in 2015 [5] and 2016 [2]. At CHI 2016, the course was run as a whole day event on the weekend before the main conference program, attracting 30 attendees. Most of the attendees were PhD students with a Computer Science background at an early stage in their research training (i.e., 1st or 2nd year PhD students). The course is therefore primarily aimed at providing HCI research methods training for student attendees at the conference.

An innovation that we are keen to incorporate into our course for CHI 2017 is the use of flipped lectures and e-lectures. These formats will allow attendees to engage with some of the core content of the course ahead of arriving at the conference. This will allow us to give more time at the conference to structured practical activities that will help students develop core research skills. These materials will be adapted and extended from those that are currently being used on the HCI MSc program at UCL.

Curriculum

The one-day course will be divided between two sessions (morning and afternoon). In the morning session we will focus on HCI research that takes a quantitative approach:

- The purpose and benefits of controlled studies
- Experimental design
- Quantitative analysis including inferential statistics

- Quantitative studies outside the lab (e.g., field experiments)

In the afternoon session we will focus on HCI research that takes a qualitative approach:

- The purpose and benefits of qualitative methods
- Ethnographic and "in the wild" approaches
- Research techniques including interviews, observation and experience reports
- Challenges of doing situated studies

For more detailed information on course content and to access learning resources, such as lecture slides, please see the course website at: https://sites.google.com/site/chi2017researchmethods/

About the course tutors

Duncan Brumby is Director of the MSc in Human-Computer Interaction at UCL. His research takes a scientific approach to understand how people interact with interfaces elements and how devices are used in mobile settings. He is Deputy Editor-in-Chief for the International Journal of Human-Computer Studies, and has been an Associate Chair on the Understanding People subcommittee at CHI since 2012.

Ann Blandford is Professor of Human-Computer Interaction at UCL. Her work evaluates complex systems in-the-wild and she has published extensively on the use of qualitative methods in HCI research [1], particularly in the context of healthcare systems [4]. Ann has been technical program chair for IHM-HCI 2001, HCI 2006, and NordiCHI2010, and directed the UCL Interaction Centre, 2004-2011.

Anna Cox is a Reader at UCL and deputy director of UCLIC. Her research takes a scientific approach to investigating HCI, with a particular focus on immersion in gaming and how people search for information. She co-edited the first textbook on Research Methods for Human-Computer Interaction [3]. She has served as Associate Chair for CHI since 2012 and General Co-Chair for CHI PLAY 2015 and 2016.

Sandy Gould is a post-doctoral researcher at UCL interested in how people manage interruptions and multiple tasks [6,9]. He uses experimental methods to investigate multitasking behavior in laboratory and remote on-line environments. He is involved in the delivery of quantitative research methods teaching to MSc students at UCL and led a research methods course at CHI in 2015 [5].

Paul Marshall is a Senior Lecturer at UCL. His research interests concern the design and evaluation of physical and tangible interfaces. A core concern in Paul's work has centered on the contrasting studies done in-the-wild as opposed to in-the-lab [12].

References

1. Ann Blandford, Dominic Furniss, and Stephann Makri. 2016. Qualitative HCI Research: Going Behind the Scenes. *Synthesis Lectures on Human-Centered Informatics* 9, 1: 1–115. DOI: https://doi.org/10.2200/S00706ED1V01Y201602HCI034
2. Duncan P. Brumby, Ann Blandford, Anna L. Cox, Sandy J.J. Gould, and Paul Marshall. 2016. Research Methods for HCI: Understanding People Using Interactive Technologies. In *Proceedings of the 2016 CHI Conference Extended Abstracts on*

Human Factors in Computing Systems (CHI EA '16), 1028-1031.
DOI: http://dx.doi.org/10.1145/2851581.2856682

3. Paul Cairns and Anna L. Cox. 2008. *Research Methods for Human-Computer Interaction*. Cambridge University Press.
4. Dominic Furniss, Rebecca Randell, Aisling Ann O'Kane, Svetlena Taneva, Helena Mentis, and Ann Blandford. 2014. Fieldwork for Healthcare: Guidance for Investigating Human Factors in Computing Systems. *Synthesis Lectures on Assistive, Rehabilitative, and Health-Preserving Technologies* 2, 1: 1–146.
DOI: https://doi.org/10.2200/S00606ED1V02Y201410ARH007
5. Sandy J. J. Gould, Duncan P. Brumby, Anna L. Cox, Geraldine Fitzpatrick, Jettie Hoonhout, David Lamas, and Effie Law. 2015. Methods for Human-Computer Interaction Research. In *Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems* (CHI EA '15), 2473–2474.
DOI: https://doi.org/10.1145/2702613.2706691
6. Sandy J. J. Gould, Duncan P. Brumby, Anna L. Cox, Víctor González, Dario Salvucci, and Niels Taatgen. 2012. Multitasking and interruptions: a SIG on bridging the gap between research on the micro and macro worlds. In *CHI '12 Extended Abstracts on Human Factors in Computing Systems* (CHI EA '12), 1189–1192.
DOI: https://doi.org/10.1145/2212776.2212420
7. Daniel Harrison and Yvonne Rogers. 2013. UCLIC. *interactions* 20, 6: 84–87.
DOI: https://doi.org/10.1145/2533768
8. Andrew Howes, Benjamin R. Cowan, Christian P. Janssen, Anna L. Cox, Paul Cairns, Anthony J. Hornof, Stephen J. Payne, and Peter Pirolli. 2014. Interaction Science SIG: Overcoming Challenges. In *Proceedings of the Extended Abstracts of the 32nd Annual ACM Conference on Human Factors in Computing Systems* (CHI EA '14), 1127–1130.
DOI: https://doi.org/10.1145/2559206.2559208
9. Christian P. Janssen, Sandy J. J. Gould, Simon Y. W. Li, Duncan P. Brumby, and Anna L. Cox. 2015. Integrating knowledge of multitasking and interruptions across different perspectives and research methods. *International Journal of Human-Computer Studies* 79: 1–5.
DOI: https://doi.org/10.1016/j.ijhcs.2015.03.002
10. Letitia Lew, Truc Nguyen, Solomon Messing, and Sean Westwood. 2011. Of Course I Wouldn't Do That in Real Life: Advancing the Arguments for Increasing Realism in HCI Experiments. In *CHI '11 Extended Abstracts on Human Factors in Computing Systems* (CHI EA '11), 419–428.
DOI: https://doi.org/10.1145/1979742.1979621
11. Yvonne Rogers. 2012. HCI Theory: Classical, Modern, and Contemporary. *Synthesis Lectures on Human-Centered Informatics* 5, 2: 1–129.
DOI: https://doi.org/10.2200/S00418ED1V01Y201205HCI014
12. Yvonne Rogers, Nicola Yuill, and Paul Marshall. 2013. Contrasting lab-based and in-the-wild studies for evaluating multi-user technologies. *The Sage Handbook of Digital Technology Research*. SAGE Publications.