Research Methods for HCI: Understanding People Using Interactive Technologies

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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 philosophical 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-systems, Human-Computer Interaction (HCI) research must be diverse in the methods and approaches that it uses [18,23].

In this course we shall introduce research methods that are used for understanding people and interactional contexts in HCI problems. 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 methodological approaches are usually required. 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. What makes Interaction Science [17] a useful approach is different to what makes an ethnographical approach [2] useful. The benefits that field studies bring to validity are tempered by the difficulties that arise when trying to control confounding factors outside the lab [20]. 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/) [16]. 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.

Curriculum

The course will be broadly divided between two sessions. In the first session we will focus on HCI research that takes a quantitative approach:

- History of controlled studies in HCI
- 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 second session we will focus on HCI research that takes a qualitative approach:

- History of qualitative methods in HCI
- 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

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 [4,6] and how devices are used in mobile settings [3,5,7,25]. He is an Associate Editor 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 [2,10], particularly in the context of healthcare systems [11]. 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 [19] and how people search for information [21]. She co-edited the first textbook on Research Methods for Human-Computer Interaction [9]. 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 [12,18]. He uses experimental methods to investigate multitasking behavior in laboratory [8] and remote on-line environments [13,14]. 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 [15].

Paul Marshall is a Senior Lecturer at UCL. His research interests concern the design and evaluation of physical [1] and tangible interfaces [22]. A core concern in Paul's work has centered on the contrasting studies done in-the-wild as opposed to in-the-lab [24].

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