Designing Personal Informatics Designers: Creating a Graduate Course in Personal Informatics

Erik Hofer

School of Information

University of Michigan

105 S. State Street

Ann Arbor, MI 48109 USA

ehofer@umich.edu

Abstract

In this position paper, I describe the design of a graduate-level course in user-experience and interaction design for personal informatics applications. This master's level course was taught in Winter 2011 at the University of Michigan School of Information in order to introduce students interested in designing personal informatics tools to a variety of interdisciplinary design challenges inherent in personal informatics applications, including measurement theory, methods, models of behavior change, game dynamics, visualization and ethics.

Keywords

Personal informatics, HCI education, personal data collection

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Education, Design, Human Factors.

Introduction

Personal informatics represents an area of rich opportunity for HCI researchers and practitioners, as the emerging technologies that help people

systematically collect, make sense of and act on data about their own lives include a number of social, behavioral and technical challenges. This application area also is a rich opportunity space for firms seeking to create consumer products and services, as evidenced by the creation of a number of companies that provide products that help people make sense of different aspects of their lives, such as activity [2] , sleep [10], spending habits [6] and online activity [7]. Much of the theory and approach typically taught in HCI education programs is directly applicable to personal informatics applications, but these applications also include a number of challenges not found in other HCI application areas. In order to prepare a set of designers with the specific skill sets to produce successful user experiences and applications for these new product firms, I developed a course on designing personal informatics technologies for the Master of Science in Information program at the University of Michigan School of Information in Winter 2011. This position paper describes the approach to the course.

Course Design

The course format combines the studio model with lectures on topics relevant to designing personal informatics. Students are assigned to teams of 2-4 to develop a prototype application over the course of the semester. Course topics include the following key issues in personal informatics:

- Frameworks for personal informatics use, including theories of self-knowledge, self-experimentation [8] and studies of technology use [3]

- Methods and measurement theory, including measure design (i.e. [9]), data collection techniques and basic sensing using the LilyPad Arduino platform [4]

- Models of motivation (i.e. [1]) and behavior change

- Application of game mechanics to behavior change problems [5]

- Visualization and analysis, focusing on time-series analyses and information aesthetics

- Ethical considerations in personal data collection, focusing on the problems that arise around data collection and the sharing of results in the context of social media platforms

- Case studies on the use of personal informatics in health and wellness, sustainability and productivity

In addition to these topics, students worked on producing solutions to a number of design challenges that forced them to combine their new expertise in each of these domains to create new system designs or suggest improvements to existing applications.

Student Projects

The students developed a number of interesting projects for their major design assignment. The topics of these projects reflect areas of both need and design opportunity, including stress and mood assessment, task tracking, the sustainability impacts of consumer choices, food consumption and social interaction.

All of these projects are underway, but I plan to provide a summary analysis of the student projects and the high-level lessons learned.

Contributions to the Workshop

While I realize that the focus of the CHI workshop is on research issues in personal informatics, I feel that the experience in designing and teaching this course will be a valuable contribution to the workshop. The overall organization of the course topics represents a set of key theoretical (and multi-disciplinary) challenges in designing personal informatics systems and in evaluating their use. Beyond simply cataloging these issues, organizing the lectures provided some clear lessons about where clear design guidance can be found in the various literatures, as well as ways to integrate the models and lessons from different disciplines.

Taken together, the student design projects also represent a strong contribution to the workshop. Completed over a relatively short duration, I plan to report on all nine of the student projects, providing some discussion of the emergent research challenges, design difficulties and the feasibility of implementation across a fairly broad set of personal informatics applications.

Example citations

[1] Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, *50*(2), 179–211.

[2] FitBit, http://fitbit.com.

[3] Ian Li, Anind Dey, and Jodi Forlizzi. 2010. A stage-based model of personal informatics systems. In *Proceedings of the 28th international conference on Human factors in computing systems* (CHI '10). ACM, New York, NY, USA, 557-566.

[4] Leah Buechley, Mike Eisenberg, Jaime Catchen, and Ali Crockett. 2008. The LilyPad Arduino: using computational textiles to investigate engagement, aesthetics, and diversity in computer science education. In *Proceeding of the twenty-sixth annual SIGCHI conference on Human factors in computing systems* (CHI '08). ACM, New York, NY, USA,

[5] McGonigal, J. (2011). Reality Is Broken: Why Games Make Us Better and How They Can Change the World. Penguin Press HC.

[6] Mint, http://www.mint.com.

[7] Rescue Time, http://www.rescuetime.com.

[8] Roberts, S. (2010). The unreasonable effectiveness of my self-experimentation. *Medical Hypotheses*.

[9] Webb, E., Campbell, D. T., Schwartz, R. D., & Sechrest, L. (1966). *Unobtrusive measures: Nonreactive research in the social sciences*. Chicago, 1966.

[10] Zeo, http://myzeo.com.