
Know Thyself: Monitoring and Reflecting on Facets of One's Life

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Abstract

People strive to gain better knowledge of themselves by collecting information about their behaviors, habits, and thoughts. Personal informatics systems can help by facilitating the collection of personal information and the reflection on that information. These systems satisfy people's innate curiosity about themselves and encourage holistic engagement with one's life. Development of such systems poses new challenges in human-computer interaction and opens opportunities for new applications and collaborations between diverse disciplines, such as design, life-logging, ubiquitous computing, persuasive technologies, and information visualization.

Keywords

Personal informatics, reflection, awareness, behavior, life logging, visualizations, study methods

ACM Classification Keywords

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

General Terms

Design, Experimentation, Human Factors

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Web Page

More information about this workshop is available at <http://personalinformatics.org/chi2010/>.

Introduction

Knowing oneself has many benefits, such as fostering self-insight [2], increasing self-control [4], and promoting positive behaviors such as energy conservation [5]. However, knowing oneself is difficult because we often have incomplete knowledge of ourselves [6], we cannot monitor our behaviors all the time, and we cannot easily find patterns in our behaviors.

Computers can help; they can store large amounts of data, analyze the data for patterns, visualize the data, and provide feedback to users at opportune times. A new class of applications and web sites called *personal informatics* is appearing that collects and provides access to personal behavioral information (e.g., Mint.com and Google Web History).

Personal informatics poses new challenges and opens opportunities for research in human-computer interaction. What behaviors would benefit from personal informatics? How do we make it easier for the user to monitor his/her behaviors? How do we present the information to the user? Lastly, how do we integrate collection of data and reflection on the data into a seamless interaction? This workshop will combine a diverse set of participants to tackle the many issues of this growing field.

Approach

We will organize the themes of the workshop along the five stages of personal informatics systems [3]:

Preparation, Collection, Integration, Reflection, and Action. These stages will serve as starting points for discussions about need-finding, behavioral studies, technological solutions, and interaction design issues.

Preparation: What behaviors would benefit from personal informatics? If we introduce personal informatics to help users learn about their behaviors, we need to understand what users want to learn. What kinds of information are pertinent to a particular behavior? Additionally, not everyone needs technological assistance in learning about behaviors. Finding the appropriate users and information systems is critical in building effective personal informatics systems.

Collection: How do we collect behavioral data with minimal burden on the user? Personal informatics systems often require that users record behavioral information for several days, even weeks or months. Various technologies can automate sensing of information about the user, e.g., GPS for the user's location, financial infrastructure for the user's purchasing habits. For some information, systems must require users to input information manually because either the sensing technology does not exist yet or the technology is not robust enough for everyday use. In these cases, interaction with the application should be painless or the application must motivate the user to keep recording.

Integration: How do we integrate the monitoring and providing information to the user to provide a seamless interaction to users? Personal informatics tools require users to interact with the system during collection and reflection, e.g., carrying a sensing device daily, recording information on a web form, exploring

visualizations for patterns, and listening to advice from suggestions. Engaging the user only during collection may not allow the user to reflect about their behaviors over the long-term. On the other hand, engaging the user only during reflection may lead to lack of data recording.

Reflection: How do we present the information to the user? Providing the wealth of information about different behaviors to users is a challenge. One challenge is to provide the information for easy and quick understanding. Another challenge is determining the level of detail at which information is presented to users.

Action: What are the effects of personal informatics on daily life? Once the information has been recorded and presented to the user, how will the interaction affect the user? This is a challenge because this will require users studies over long periods of time; the study has to allow users to collect enough information for effective feedback. There are several effects to study in detail: trust in the system, motivation, better decision-making, loss of control, etc.

Workshop Goals and Themes

One goal of this workshop is to define opportunities for exploration of human-computer interaction in personal informatics. A unique aspect of personal informatics is that the user is both source of the input and the receiver of the output. This has several interesting implications in the technology and design of systems and applications. Different areas such as, ubiquitous computing, life logging, and visualizations, have tackled different aspects of the monitoring and feedback parts of personal informatics. However, we argue that

successful personal informatics systems must integrate monitoring and feedback seamlessly.

Another goal is to share expertise between different disciplines to better tackle the many challenges that personal informatics poses on interaction with computers. Researchers need to study how personal informatics can benefit people's daily lives as well as develop the technologies that will make personal informatics available in daily life.

Lastly, we want to get more researchers and practitioners interested in this burgeoning field. Design guidelines and infrastructures need to be created to help more people build personal informatics systems and applications.

Topics of Interest

We invite contributions from various disciplines on topics including but not limited to:

- New and current personal informatics applications and systems on the desktop and online
- Sensor and life-logging technologies that monitor various personal behavioral information
- Effective feedback techniques, such as visualizations, virtual agents, and persuasive technologies, that help users become more aware of their own behaviors
- Interaction techniques that alleviate the burden that personal informatics impose on engagement
- Effects of self-knowledge and self-awareness on behaviors and daily life
- Methods of conducting long-term studies to determine effects of information on user behavior

Participants & Expected Community Interest

The workshop will invite technologists, behavioral scientists, designers, and artists working on topics related to personal informatics. In particular, we will recruit participants who are developing personal informatics applications on the desktop and online; who develop sensor technologies, life logging applications, visualizations, and effective feedback techniques; who have expertise in testing and evaluating self-knowledge.

While few human-computer interaction researchers have tackled personal informatics explicitly, many have contributed to different aspects of personal informatics. More personal informatics applications and systems are being created that require users to be engaged with the interface during collection and reflection. Personal informatics poses many challenges and opportunities to pursue.

Additionally, the mainstream media has become interested in personal informatics with articles in *The Wall Street Journal* [1] and *Wired* [7]. These articles describe the current technologies people are building and using to learn their own behaviors, but we do not know how effective these current tools are in helping people. This is an opportunity to start the discussion on research issues that will lead to better personal informatics systems in the future.

We are currently pursuing personal informatics research in the Human-Computer Interaction Institute at Carnegie Mellon University. We have developed several systems and applications that facilitate manual

and automated monitoring of user behavior and that allow users to explore their behavior using visualizations. We have also conducted long-term studies on the effects of personal informatics on users' daily lives. These works will inform the activities and discussions during the workshop. Beyond the workshop, we will continue discussing our work and the participants' research.

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