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## HCI research in healthcare: Using theory from evidence to practice

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# Workshop Abstract: HCI Research in Healthcare: Using Theory from Evidence to Practice

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## Abstract

Theory has an important place in HCI research in healthcare. However, resources on this area are spread across different multidisciplinary journals. It is timely for the community to reflect on the classic, modern, and contemporary theories they use, to map where strengths and weaknesses lie, and where emerging opportunities are unfolding. This workshop aims to encourage dialogue and exchange of ideas with examples of current and emerging theory in HCI and healthcare to support researchers and practitioners as they address the challenges and opportunities of this domain. We aim to produce a journal special issue to map the state of the art in this area.

## Author Keywords

Theory; Medical; Health; Clinical; Design; Evaluation.

## ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## General Terms

Theory, Design, Human Factors

**Motivation**

Healthcare presents a particularly challenging domain for Human-Computer Interaction (HCI) research. The complexity of work, variability of work practices across organizations, richness of, and reliance on information, and continuous collaborative activity [2, 9] provide opportunities to explore new forms of interaction and to advance theory in this domain [11].

This workshop builds on the CHI 2013 workshop: *HCI Fieldwork in Healthcare: Creating a Graduate Guidebook* [5]. Here we brought together researchers from diverse backgrounds to share experiences and expertise in carrying out healthcare fieldwork in both clinical and non-clinical settings: across hospitals, outpatient care facilities, homecare environments, and on the move when using mobile healthcare technology. This workshop was very successful, receiving 36 submissions, from which 20 delegates were invited to participate. The workshop has resulted in two edited volumes that will be in print by CHI 2014.

The need to address the role of theory in HCI emerged as a prominent theme. Among those issues discussed were the significant barriers to successful design and implementation of Health Information Technologies (HIT) and the unanticipated consequences on the work practices of physicians and nurses that indicate problems in integrating technology solutions with existing work practices [1,3]. In addition, factors related to regulation, organizational culture and political climate in healthcare, also influence technology implementation and adoption in healthcare settings. This is of particular concern to the HCI community carrying out research and working to inform design practice in healthcare since it implies a mismatch

between the designs being implemented, the understanding of the domain, and the overall approach.

The complexity and uniqueness of healthcare practices raises a variety of practical questions, related to the clinical setting and the “in the wild” healthcare environment, that may benefit from a theoretical perspective, including questions addressing transition [8], mobility [2], temporality [4], information flow [6], and workflow [12]. Attendees at the CH2013 workshop highlighted the difference in approach between HCI methodology and the research models established in clinical work, and classic, modern and contemporary HCI theory [11]. The focus on fieldwork meant that many modern perspectives were used (e.g. ethnography and distributed cognition), however some contemporary perspectives were also used (e.g. design and value-led approaches).

Participants also suggested that research on the actual impacts of HIT, such as on daily work practices, adaptation behavior, and preventable errors, has the potential to inform the design of more effective health IT systems, as opposed to studying only adoption rates or clinically significant errors. However, without understanding the healthcare context and the ‘how’ and ‘why’ of health practices, positive change may be more difficult to achieve. Hence, the acquisition of such understanding through the application of sound and appropriate theory is necessary. While previous studies provide valuable insights into understanding healthcare practices in targeted settings [9], there has only been limited work that articulates the role of HCI theory in healthcare.

### Workshop Focus

The objective of the workshop is to further develop dialogue about theory between researchers who do HCI research in healthcare, including clinical and non-clinical contexts such as hospitals, outpatient care settings, homecare environments and mobile healthcare technology settings. We are interested in a broad range of approaches and in exploring a variety of theoretical lenses, among them:

- social interactionism,
- socio-technical,
- values in design,
- activity theory,
- technology as experience,
- distributed and social cognition.

We expect this list to develop from the participants' submissions and during discussions on the four themes below.

While many theoretical perspectives can inform HCI work on healthcare, equally theoretical perspectives also have the potential to develop from HCI work in healthcare. Much theoretical work on the concept of temporality [10], for example, comes from extensive fieldwork in healthcare settings. More recently HCI has moved away from the dominant themes of synchronous vs. asynchronous communication or collaborative work [9] to questions of supporting complex and unfolding work practices over time [10]. In particular, studies of information transfer between members of healthcare teams, among work organizations, as well as related to mobility issues, have contributed to this change [10].

The workshop will address the following provisional themes:

1. Body of Evidence: Exploring the evidence for the applicability of HCI theory to healthcare.
2. Beyond Health: Discussion of theory originating from healthcare related work that is applicable to the wider HCI community and theories not yet applied to healthcare.
3. In Practice: Moving from theory to the support of design, evaluation, and implementation activities.
4. Future Focus: New ideas emerging from the experience of HCI research in healthcare.

### Workshop Goals

We intend for this workshop to build on the success of the CHI 2013 Fieldwork workshop and benefit HCI researchers and the wider health informatics community by providing a venue for theoretical discussion and the exchange of ideas and experiences. Having identified a number of challenges of conducting fieldwork in healthcare during last year's workshop, this year we aim to critically examine the appropriateness of classic, modern, and contemporary theoretical approaches to this type of work and build a body of knowledge to guide future work in this area. Our hope is to support bridging the gap between clinical practice and technology design in healthcare such that future technologies will demonstrate a good match to the intended healthcare environments. We aim to produce a journal special issue from the workshop to make these discussions available to other researchers and inform new research, with the ultimate aim of contributing to design, evaluation and implementation practice.

Specifically, we aim to:

- provide an opportunity for researchers, designers, and practitioners in relevant fields, such as HCI, CSCW, pervasive health, medical informatics, patient safety and general medicine to share and learn from each other's theoretical approaches,
- share theoretical insights from research experiences in different settings and the conceptual challenges of particular theoretical lens,
- discuss both common and uncommon theoretical approaches and explore possible new theoretical directions,
- brainstorm and map different theoretical approaches to specific challenges in healthcare, e.g. workflow, errors, transitions, trajectories, culture, political climate, etc.,
- and develop an outline for a special issue to communicate current theoretical work in healthcare to the wider HCI, health informatics, and general medicine communities.

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