HCI and Health: Learning from Interdisciplinary Interactions.

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Abstract
HCI has multidisciplinary roots and has drawn from and contributed to different disciplines, including computer science, psychology, sociology, and medicine. There is a natural overlap between health and HCI researchers, given their joint focus on utilising technologies to better support people's health and wellbeing. However, the best digital health interventions are not simply the result of the 'application' of HCI to the domain of healthcare, but emerge when researchers from both camps seek to overcome differences in disciplinary practices, traditions, and values in order to collaborate more effectively and productively. We propose a special interest group (SIG) to include interdisciplinary researchers (i.e., participants active in both communities) as well as researchers from either discipline, but with interests in the other field.

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Digital health; wellbeing; public health; HCI; methodology; evidence; iteration; interventions; evaluation; paradigms; interdisciplinary; multidisciplinary; collaboration

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

Motivation

Today's knowledge landscape in HCI mandates multidisciplinary research. Researchers can accomplish more through collaboration. However, successful interdisciplinary team research goes beyond abstract 'collaboration' and necessitates the integration of methodologies, perspectives and data from multiple paradigms to advance understanding of or to solve real world problems. Such research is demanding in its requirement that individual researchers effectively gain an in-depth understanding of multiple disciplines, develop a common research language and adhere to mutually acceptable conceptual frameworks.

The growing body of health related research in HCI demonstrates that this is an important and growing topic. HCI research in healthcare presents specific challenges to researchers. There are significant differences in the methodological approaches adopted by HCI researchers and the research models established in clinical work. One of the key issues in translating between disciplines is finding common ground between differing design, development and evaluation paradigms and their inherently contrasting priorities and values. A case in point is the comparison between the traditional linear model of clinical/health service research and public health research, driven by the evidence hierarchy [1] (and funding preference) of the Randomised Control Trial (RCT), versus the HCI approach of explorative, rapid iteration and willingness to 'fail quickly'. Questions of risk management, accountability and efficacy are especially pertinent in a health context [2] and highlight the need for a more agile science of digital health.

HCI researchers generally take a more agile approach to that used in more clinical settings. This can be perceived by outsiders as being 'messy' and can therefore necessitate changes in collaborative processes or perspective. However, rather than shifting one discipline's view to be more aligned with that of another, future collaboration needs to focus on harnessing best practice from across a diverse range of approaches. Synthesis of disciplinary lenses will ultimately result in effective, usable and acceptable digital health interventions being developed in a more timely and resource-efficient way.

Disciplinary models, norms and ideas are deeply ingrained [3]. This is noted even in approaches to dissemination of research and the value of journal publications versus conference proceedings such as CHI. These publication differences between disciplines directly impact collaborations and the perception of what constitutes 'good evidence'. Additional challenges exist within the rapidly evolving field of digital health not least due to budgetary pressure in a climate of increasing costs for the delivery of healthcare. Competition to provide commissioned services, including research, necessitates trying to balance perceived service needs and existing process norms, with robust research and design practices all being conducted in a timely and appropriate manner.

The clinical environment is often an unfamiliar landscape for the HCI community. There is an understandably high focus on appropriate ethical conduct, risk mitigation and patient safety, and there are significant personal and professional challenges in conducting research in such conditions. Clinical and health service research has much to teach the HCI community about good research in such contexts.

At the heart of the challenges lies the specific difficulty of establishing a common research language between health researchers or medical practitioners and technologists. Rather than taking an approach which sees teams from different disciplines 'patching' their

work together, there is a growing responsibility within the field of digital health to conduct efficient research that realizes a team's holistic potential. To achieve this synergy, we need to initiate and maintain a wider conversation addressing both disciplinary differences and similarities. In addition, the time is right to invite funding agencies and peer review systems to prioritise and facilitate an interdisciplinary approach.

SIG Aims and Deliverables

This SIG targets the international need to distil methods and strategies used in individual research project settings so that the learning from different projects is not lost and can be used to build expertise within the community. Whilst a lot more research activity is taking place in health in HCI, often the challenges of working in multidisciplinary teams remain unaddressed, due to space constraints in publications and few forums for discussion or documentation. This SIG will build on previous workshops in Fieldwork for Healthcare (CHI'2013 and CHI'2014), which led to the publication of two books [4,5].

The objective of the SIG is to find the best ways to document and build on our shared knowledge as a community through discussion amongst researchers who work in multidisciplinary settings, including clinical and non-clinical contexts such as in hospitals, home environments, and using health technology on the move. Our focus is on the pragmatic challenges of organising, performing, evaluating, publishing and funding multidisciplinary studies in healthcare. We want to initiate a crowdsourced toolkit / reading list / repository of best practice based on what has worked or not worked in different settings. We also want to create a crowd-sourced multidisciplinary glossary of terms and methods to shape a common understanding. These resources will complement the community built by previous *Fieldwork in Healthcare* workshops. Based on the inputs, we will propose a special issue on interdisciplinary research in digital health. Our ultimate aim is to publish a "Handbook on Research in Digital Health" which will outline, explain and provide methods for conducting interdisciplinary digital health research that bridges the medical and technical sciences. Further, we aim to strengthen the community of researchers, designers and practitioners working in multidisciplinary health settings. Researchers will share knowledge and insights into methods and tools by discussing questions of interest, such as:

1. **The evidence hierarchy**: while there is consensus that the evidence hierarchy is difficult to apply in digital technology and even many health settings, what methods can be used to apply rigour? Can we abandon the hierarchy? Do we need new frameworks?
2. **Development and evaluation paradigms:** the development and evaluation of digital health interventions presents particular challenges and cuts across methodological paradigms; how can we develop a broader portfolio of methods to enrich the digital health landscape? How can we address pragmatic differences regarding publishing and funding?
3. **Establishing clinical evidence:** clinical evidence of efficacy and efficiency is core to clinical acceptance and implementation of digital health technology. However, traditional methods of establishing a solid evidence base are simultaneously slow and challenged by the pace of technological development.
4. **Building a common language:** translating between disciplines is important; how do we describe things? What terms are contentious and which are shared? What methods are to be used? What is evidence?
5. **How can we share and build our expertise?** We will explore how to build resources by crowdsourcing methods and practical means of supporting such a community and information repository.

Goals and Outcomes

We will discuss the topics in an interactive format through provocative talks by experts in the SIG topics, and a panel discussion. We will identify challenges, and strategies to develop a crowdsourced repository of resources. We will also propose a special journal issue based on how people have tackled multidisciplinary working and overcome some of the issues mentioned previously (e.g. ethics, evidence, mechanisms). After the SIG meeting, we will continue to codesign a multi-disciplinary network for those studying and designing at the intersection of health and HCI using and growing the existing mailing list and network of Fieldwork in HCI blog. We will use this list to organise workshops, publish a special journal issue, and promote grant/ project collaborations. The "Handbook on Research in Digital Health" will also be pursued. We anticipate that fostered communication and collaboration among researchers will promote more awareness of research and practice from different domains, leading to a more comprehensive understanding of the challenges and opportunities for interdisciplinary interactions between HCI and healthcare.

Organisers and Audience

The SIG is organised by researchers working in digital health who have extensive experience of working with healthcare professionals, patients and researchers in medical health: Aneesha Singh (postdoctoral researcher doing interdisciplinary research for designing digital health technologies), Nikki Newhouse (PhD candidate and researcher working on interdisciplinary digital intervention development), Jo Gibbs (clinical academic specialising in sexual health and digital health), Ann Blandford (professor of HCI and director of Institute of Digital Health), Pam Briggs (professor of applied psychology working on eHealth and online trust), Yunan Chen (associate professor in HCI, working on interactive systems for clinical documentation, patient-provider interaction and personal information management during chronic care), Helena Mentis (assistant professor in HCI and Health IT investigates health collaboration and communication), Kate Sellen (associate professor, researching design thinking and human factors for challenges in health-care) and Jakob Bardram (professor, with major interest in pervasive healthcare). Between them, the organisers have experience as members of conference program committees, in workshop organisation, as well as extensive publication histories in top-tier conferences (e.g. CHI, Medicine 2.0), journals (e.g. HCI, TOCHI, TAC, BMJ Open, JMIR), books and special issues. The organising team truly represents the multidisciplinary and international nature of the SIG.

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