Science vs. Science: the Complexities of Interdisciplinary Research

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Abstract

Human-Computer Interaction and Web Science are radically interdisciplinary fields, but what does this mean in practical terms? Undertaking research (and writing papers) that encompass multiple disciplinary perspectives and methods is a serious challenge and it is difficult to maintain conferences that fairly review and host contributions from multiple disciplines.

The colocation of the ACM WebSci conference with CHI in Paris, offers an unusual opportunity to bring these two communities together. Previous discussions have considered how to conduct interdisciplinary work that bridges HCI/WebSci with specific areas. Our objective is to provide a space for interested researchers from both communities to share their views and approaches to tackling the tensions and complexities associated with interdisciplinary work, whatever fields are being bridged.

Author Keywords

Interdisciplinary work; multiple epistemologies; methodology.

ACM Classification Keywords

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

Introduction

The HCI and WebSci communities have a history of interdisciplinary work within art, computer science, the humanities, design and sociology. Both communities tackle the complex challenges raised by people's interactions with digital systems, and the resulting behavioral phenomena. One perspective is that the HCI community focuses on the personal, whereas WebSci has ambitions to understand how such systems affect society in-the-large (for example, at the political or economic level) [7]. However, both approaches are grounded in individual and community interactions, and draw in an interdisciplinary way on work between the disciplines of STEM (science, technology, engineering, and mathematics) and HASS (humanities, arts, and social sciences).

Practical issues arise from the tension and complexities between STEM approaches (which through necessity strive for simplification and abstraction) and HASS approaches (which embrace complexity and explore conflicting perspectives). Such issues are especially pertinent in the context of interdisciplinary work, and are thus relevant to both HCI and Web Science research. This SIG provides a space for interdisciplinary researchers to discuss practical approaches for combating common issues, and also offers the opportunity to create bridges between the two communities.

Issues in Interdisciplinary Work

Interdisciplinary work is often subject to a fundamental tension in which positivist engineering epistemologies are at odds with interpretivist stances. This tension can often arise in HCI and WebSci: consider, for example, the rich nuances of User Experience, and the issues of evaluating Social Computing systems.

The HCI community has a rich history that encompasses discussions in this area, from multiplicity, context and experience in third-wave HCI [3], to Senger's call for engagement with multiple meanings in design and evaluation [10], and Bardzell's comparative examination of how engagement is considered in HCI and aesthetics and critical theory [1]. There have been a wealth of discussions on how to conduct interdisciplinary work when integrating various fields within HCI: for example, HCI and the Arts, HCI and the Humanities, or Computer Science and Sociology.

Particularly, recent years have seen an explosion in discussion of collaboration between Art and HCI. The CHI Digital Art community was featured at CHI'12, and HCI and the arts have been the subject of three past CHI SIGs, three CHI workshops, and one panel (for example, see Sengers and Csikszentmihályi [9], or Cockton et al. [4]). England [5] recently examined HCI-Art ventures and recommended early and ongoing collaboration to develop mutually agreeable goals, and the development of practices and techniques on both sides to support further understanding.

Other discussions concern the relationship between HCI and the humanities [2] and complexity in science and design: Stolterman [12] argues that science is not always the best source of methods for tackling design complexity, and calls for a better understanding of the nature of design practice in such work.

Related discussions debate how to evaluate creative design methods. Shneiderman [11] discusses the

Timing	Activity
10 mins	Introduction from the organisers, and the aims for the SIG session.
5 min	Questions from the audience, alternative questions to consider during the session
30 mins	Courtroom trial: groups prepare their cases.
30 mins	Courtroom trial: groups report their arguments back to the room as a whole.
5 mins	Closing remarks and any other business.

Table 1. Planned timetable for the SvS SIG at CHI 2013.

difficulty in striking a balance between qualitative and quantitative methods, noting that there is often pressure from journal and conference reviewers to provide statistically significant results, yet laboratory studies with many participants can be inappropriate. Fallman and Stolterman [10] present a discussion of rigour and relevance in interaction design research, defining 'rigour' as validity and reliability, and relevance as related weight and generalizability of contributions.

Kaye [8] takes a step back to discuss the problems that arise from such a rich diversity of epistemologies, particularly with respect to the review process. He describes CSCW's approach of letting associate chairs nominate themselves for papers (an opportunity to match expertise with epistemic culture). CHI authors submit to sub-committees, but this is problematic: it's hard to recognise epistemic cultures from committee descriptions, especially for new authors.

The Web Science community is youthful, yet discussions of interdisciplinary methodology are already emerging. WebSci'12 included an examination of how Web Science and HCI relate [7], while Tinati et al [13] call for a meshing of methods from different perspectives, offering a demonstration of how this can be done (with Computer Science and Sociology) and the advantages that it offers.

The proposed SIG
It is clear that many parts of the CHI community are trying to engage with interdisciplinary work, whether in the arts, humanities or design; such issues are also clearly relevant to the WebSci community. This SIG provides a space for people from both fields to come together and discuss topics such as:

1) Differences in philosophy (and the reasons and motivations behind them)

2) Differences in methodological approaches (tools and techniques, levels of certainty)

3) Differences in scholarly culture (publishing, review expectations, communication)

This SIG aims to draw on interested researchers and practitioners that span both CHI and WebSci, and identify key issues (and possible solutions) in interdisciplinary work that can inform future discussions.

We have taken a deliberately playful approach in order to overcome some of the inherent difficulties in bringing a diverse group of people together. Table 1 shows our planned timetable. In the main part of the session, we will take a discussion of case studies and turn them into a courtroom trial. We will split participants into groups of 6 - 8, giving each group a one-page case study of problematic interdisciplinary work: the case studies will concern research examining trust, privacy and power online. (For ethical reasons, these will be fictitious in nature, but based on real life experiences.) Each group will discuss the issues raised by the work, and then split into two, preparing a case for the prosecution and a case for the defence. The groups will then present back to the room, who will eventually take a vote to decide a verdict.

The idea behind the courtroom trial format - in addition to facilitating a lively, engaged SIG - is to enable participants to debate critically the advantages as well as the disadvantages of interdisciplinary approaches.

We hope that the performative nature of the activity will also help break down some of the barriers normally associated with such debates.

During the introduction, we will highlight problem areas (including those in the numbered list above) and ask participants to keep these in mind. During the Q&A session, we would invite, in addition to clarifying questions, suggestions of other facets of interest. We would also welcome participants in embellishing the case studies with their own examples of interdisciplinary work, although we would ask them to maintain the anonymity of such work.

Conclusions

The CHI and Web Science communities are richly diverse, with multiple interdisciplinary endeavours. The proliferation of SIGs, workshops and papers discussing how to conduct such work in different dimensions (such as art, the humanities, and design) suggests that many researchers struggle – understandably – with the issues that interdisciplinary work can bring. It is clear that discerning appropriate methodologies for interdisciplinary work (and appropriate peer review mechanisms for such work) is non-trivial.

In this SIG we hope to strengthen the community of people actively engaging in such activity, and identify key issues and possible solutions that span interdisciplinary work. In addition to building bridges between the HCI and Web Science communities, we also hope to bridge the sub-communities within CHI who have been addressing this problem.

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Supplementary material

Communities of interest

This SIG is relevant to any HCI and Web Science researchers who are actively engaged in interdisciplinary research. It is also relevant to those who are involved with (or interested in) the peer review process and how this deals with interdisciplinary work.

Assumed attendee background

We assume that our attendees are HCI or WebSci researchers with some level of interest in interdisciplinary work. We assume that most (but not all) attendees will have a level of experience in interdisciplinary work.

Approach for organizing and presenting the SIG

See the SIG description above. We would use a brief PowerPoint presentation in the introduction session, and a whiteboard or flipchart to track contributions from groups in the feedback/verdict session.

Informal schedule

Please see Table 1.

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