The Arts, HCI, and Innovation Policy Discourse (Invited Panel)

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Abstract

Although both HCI and innovation policy discourse have a STEM (science, technology, engineering, and mathematics) basis, both also include trends that incorporate the arts. The purpose of this panel is to show how HCI/arts discourse and innovation policy/arts discourse inform each other. We then discuss with the audience how innovation initiatives configure programs and roles for artists and HCI professionals working in HCI/arts.

Author Keywords Art; HCI; innovation; policy

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Introduction

Innovation policy discourse incorporating the arts has followed a similar trajectory as HCI/arts. Foundational roots in the 1990's [11, 16, 25] support an evolution of the discourse throughout the 2000's [1, 2, 3, 7, 13, 15, 18, 19, 20, 21, 23]. As in HCI, broader innovation discourse incorporating the arts challenges conventional STEM (science, technology, engineering, and mathematics) approaches and promotes more flexible knowledge bases [1, 20, 21].

Many readers and audience members will be familiar with the U.S. National Academies book, *Beyond Productivity: Information Technology, Innovation, and Creativity* [19]

Artistic and cultural creativity and innovation inspire new thinking which can bring about huge social progress. Artists helped bring down the Berlin Wall, for instance. One of the important messages of this manifesto and the work of our ambassadors is the need to put together creativity and innovation. To link participants from science to art and culture. We need to put innovation and creativity at the heart of tomorrow's policies.

José Manuel Durão Barroso,
President of the European Commission
[2]

At a broad level, arts and humanities research contributes to a constantly growing body of knowledge on human experience, agency, identity and expression, as constructed through language, literature, artefacts and performance….

The arts and humanities create languages that can communicate complexity in a comprehensible way.

Bakhshi, Schneider, and Walker [1]

and the U.S. National Science Foundation's (NSF) CreativeIT program. These two projects combined insights from information technology (IT) disciplines, notably HCI and artificial intelligence, with rationales from innovation policy to advocate for and create interdisciplinary research programs at the intersections of the arts, design, creativity, innovation, and information technology. In this panel, we suggest further exchanges between HCI/arts and innovation policy/arts discourse.

On one hand, innovation discourse can inform HCI/arts on a conceptual level. For example, since the arts have been incorporated into the CHI program, there has been lively discourse about the role of the arts in HCI research. A recent CHI SIG indicated the potential of the arts to "advance the leading edge of design research" and proposed clarification of "what do the arts specifically offer CHI" [6]. Other CHI texts have presented the potential of artists and their work to "prefigure issues in HCI research and engage in discourse from alternative perspectives" [10], promote "divergent thinking and creative visions" [14], and as an exemplary resource to inspire nuanced thinking about issues of interest in HCI [8]. The 2008 report, *The art of innovation: How fine arts graduates contribute to innovation*, commissioned by the U.K.'s National Endowment for Science, Technology, and the Arts (NESTA) [20] uses quantitative and qualitative methods to build evidence-based descriptions of the experimental, critical, interpretive, and organizational skills that develop through art practice. This and similar reports end with "implications for policy" sections which can double as implications for project organization and collaboration. In this example, implications include how to beneficially facilitate artist crossover participation in other fields.

In turn, artists and HCI professionals working in HCI/arts can inform innovation policy discourse by providing

insights from their practice. For example, during the CHI 2011 *The User in Flux* workshop [17] and the Digital Arts SIG [9], attendees brought up issues related to how roles for artists and HCI professionals working in HCI/arts were configured by larger research initiatives.

Panel description
This panel convenes leaders of initiatives that bridge the STEM/arts divide within both HCI and the larger innovation arena. The panelists will present these initiatives as well as the innovation policy discourse they engage. Through these examples, we give an overview of intersections between HCI/arts and innovation/arts discourse. We continue by focusing our presentation on how these and similar initiatives configure programs and roles for artists and HCI professionals. We then open the discussion to the audience for feedback regarding this and other issues. This panel takes part in the CHI 2012 Digital Arts Community theme, *Building Bridges*, created to encourage additional perspectives on HCI/arts through connections with other communities both within and beyond CHI [10].

Introduction to the panelists
Panelist **Ernest Edmonds** was combining computation and the arts in London during the early days of the digital arts. In the 1960's, he was active in the Computer Arts Society and the London computational arts scene, which gave rise to seminal events such as the exhibitions/happenings *Cybernetic Serendipity* and *Event One.* Shortly after, Edmonds pioneered practice-based Ph.D. programs in digital arts at Leicester Polytechnic, now De Montfort University.

In 1993, Edmonds and Linda Candy founded the Creativity and Cognition (C&C) conferences, now a SIGCHI series, in part to bring together digital artists

A key result of all of this work is that we do, indeed, see new art forms and new science. None of the initiatives described are satisfied with cases where the science or technology is just a servant of the artist or where the artist is just the subject of a human factors experiment.

Panelist Ernest Edmonds

Fantastic stories, rich metaphors, social relationships, and even our senses of self are all rooted in the imagination. At the same time, many social ills such as prejudice, stereotyping, and social inequity are also products of the mind. My interest in integrating the arts and sciences is to better understand the imagination and produce effective imaginative works in computational technologies.

Panelist Fox Harrell

Artists, scientists, designers, and engineers use different methods to define and solve problems, but they also share similar concerns for discovery and innovation. STEAM is about identifying and exploiting those similarities that lead to creative and innovative collaborations between the arts and sciences.

Panelist Brian K. Smith

and HCI researchers. The U.K.'s Engineering and Physical Sciences Research Council (EPSRC) was involved in the early C&C conferences and, in the mid-1990s, EPSRC added a category for creativity to their HCI agenda. This initiative funded, for example, artist-in-residence studies by Edmonds and Candy which informed HCI research [4]. Having founded the Creativity and Cognition Research Studios in the U.K., Edmonds reformed the project in Australia in 2003. These centers have fostered practice-based collaborative research between digital artists and HCI researchers [5].

In 2005, Edmonds participated in the NSF Workshop on Creativity Support Tools [22], which along with the book *Beyond Productivity* referenced above [19], was part of a critical cluster of work that informed the NSF CreativeIT program. From 2007 to 2010, this program included projects combining research in creativity, the arts, and information technology. The CreativeIT program was not only the single most comprehensive U.S. program to fund research at the intersection of the arts and HCI, but it also created a community of researchers to support further initiatives.

Panelist **Fox Harrell** founded the Imagination, Computation, and Expression Laboratory (ICE Lab) at MIT to explore the relationship between imaginative cognition, digital media arts, and computation. In 2010, Harrell was the Principle Investigator of an NSF workshop grant for a joint meeting of the NSF and the National Endowment for the Arts (NEA). The workshop convened thought leaders, including artists, engineers, computer scientists, and educators, to develop a roadmap for interagency art, science, and technology research and education [12]. Members of the HCI community were instrumental to this effort, in part due to the relationship that had developed between HCI and

the digital arts as reflected in *Beyond Productivity*, the ACM Creativity and Cognition conferences, and CHI.

A priority of the joint NSF/NEA meeting was to support the expansion of the STEM foundations of research and education to STEAM (STEM plus arts). Rhode Island School of Design (RISD) has been an advocate of the STEM to STEAM movement. In 2011, **Brian K. Smith** and Christopher Rose of RISD convened an NSF workshop that brought the community together to discuss integrating art and design into STEM. RISD has lent continued support to Rhode Island Congressman James R. Langevin as he shepherds House Resolution 319 "Expressing the sense of the House of Representatives that adding art and design into Federal programs that target the Science, Technology, Engineering, and Mathematics (STEM) fields encourages innovation and economic growth in the United States" [24].

The United States has exemplary STEAM academic programs on the university level. In 1997, artist, inventor, engineer, and researcher **Ken Goldberg** founded the Art, Technology, and Culture Colloquium at University of California, Berkeley to establish a forum for resisting conventional wisdom about technology and culture. This lecture series established a trans-disciplinary community that supported the embodiment of these perspectives into the Berkeley Center for New Media (BCNM), which Goldberg co-founded in 2004. The BCNM fosters educational programs and collaborations between arts, humanities, science, and engineering departments at UC Berkeley. University programs in the U.S. with similar missions include the DXARTS program at the University of Washington, the School of Arts, Media, and Engineering at Arizona State University, and the Arts and Technology program at the University of Texas at Dallas.

Implications of this kind of hybrid research being carried out in universities include the training of new hybrid artists/researchers for whom the development of new HCI technologies constitute a core component of their artistic practice.

Panelist Joanna Berzowska

Canadian policy supports infrastructure and research that bring together artists, scientists, engineers, and computing professionals to create new methodologies for innovation. By funding arts research at the same levels as scientific research, Canada's funding institutions prioritize artistic inquiry as an integral component of innovation. These initiatives enable artist-researchers like **Joanna Berzowska** to establish research labs based on art practices. Berzowska's XS Labs is an art and design research studio with a focus on innovation in the fields of electronic textiles and reactive garments.

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