[Slide 1] Between research traditions: negotiating an interdisciplinary research space for urban screens

Introduction

[Slide 2] I am a doctoral student doing my PhD work at Simon Fraser University's School of Interactive Arts and Technology (SIAT), an interdisciplinary school that aims to combine art and science research by allowing design students to study *and* make technological artifacts. [Slide 3] I study under the supervision of Dr. Kate Hennessy in the *Making Culture Lab*. Dr. Hennessy is a media anthropologist coming from the social sciences and humanities tradition. [Slide 4] The other two professors that sit on my doctoral committee are Dr. Carman Neustaedter, a computer scientist trained at the University of Calgary, and Jim Bizzocchi, a media & gaming scholar schooled at MIT.

[Slide 5] If I were pressed to identify my research domain, I would probably choose "social interaction design within HCI", but given that my approach to HCI [Slide 6] builds on my academic background in the fine arts, humanities, social sciences, and the natural sciences, rather than use labels which place boundaries on my work, I propose to discuss how interdisciplinarity has helped me open up a unique research space in HCI, and articulate research methods and ethics. I will end my presentation by briefly describing some of the practical challenges I have faced as an interdisciplinary scholar.

[Slide 7] Using interdisciplinarity to define a research domain

[Slide 8] In Europe, the term *Urban Screens* primarily refers to a social movement that promotes the appropriation of digital public displays in urban space for the purposes of community building and artistic creation (Struppek, 2). One of the leading figures behind this movement has been Mirjam Struppek. In this paper and in our research in general, the term urban screens is used more broadly to ecologically describe [Slide 9] a public space in the built environment that includes one or more digital displays with no particular distinction made in relation to their purpose or location. In addition, urban screens are to be understood as displays that can potentially support interactivity and artificial intelligence.

[Slide 10] Ten years ago, O'Hara et al. wrote that digital media displays were replacing non-digital ones in public space (xvii-xviii). [Slide 11] They predicted that the promising affordances of this technological platform would further accelerate this trend in the future. Their forecast has since come true. [Slide 12] In the last decade, we have seen more and more large digital displays in big cities all around the world; [Slide 13] they are fast becoming ubiquitous in public space. This phenomenon is opening up a whole new set of research questions and approaches [Slide 14] related to *public interaction* with digital displays.

[Slide 15] Drawing on social sciences theory in the fields of communications, sociology and anthropology, the overarching goal of our research is to study and develop

the participatory potential of digital displays by exploring how this new media platform can be appropriated by communities for political, social, cultural and creative purposes applied in a wide variety of public settings. This chapter of our research has much in common with Mirjam Struppek's *Urban Screen* movement.

[Slide 16] However, the majority of digital displays currently remain non-interactive. This means that their participatory potential is not being exploited in public space because they are mostly used in a one-way flow broadcasting model of information delivery. Yet the past decade has seen HCI research labs prototype a large number of interactive digital displays. **[Slide 17]** Often deployed in controlled private or semi-public settings, their designs are rarely grounded in a thorough analysis of how they might be used in actual public space. Given that our research is concerned with *how to make digital displays more interactive for public use*, we need to collaborate with computer scientists. So in fact, our research domain includes human-computer interaction (HCI) in the field of applied science and technology.

[Slide 18] In the HCI literature, the term digital displays is broadly used to describe both wall-sized video projections or the various kinds of digitally-driven LED, LCD and plasma flat-panel screens situated in public space. Site-specific media façades are an instance of the former as we see here in the slide, **[Slide 19]** while the latter, more pervasive technology can take the form of light-emitting screens used to advertise in shop windows; to provide visitors with contextual maps or information, or displays which broadcast news on subway platforms.

[Slide 20] Approaching digital media displays from a humanities perspective, Erkki Huhtamo has traced the origin of public media displays to Ancient Rome, where he claims they existed in the form of painted or carved wall inscriptions, or as placards announcing the services of the artisan class (5). On the left half of this image, we see a street sign and the remains of a mural painting on this Ancient residential façade. Moving closer in on the commercial building on the right, **[Slide 21]** we see mural inscriptions intended for public viewing on the façade of Asellina's Tavern. These inscriptions are electoral propaganda publicizing political candidates. These are archaeological digs in Pompeii, Italy dating back to 79 CE.

[Slide 22] Fast-forward two thousand years and we see the large-digital-billboard-aesthetic — also called "The Electronic Gothic" (Virilio, 61) — flood big city centers such as Times Square in New York and define the cityscapes of Tokyo, Hong Kong and Seoul. **[Slide 23]** However, let us consider this photograph of Times Square taken in New York circa 1930, more than 60 years before the public city square "went digital". All of these billboards from NY's roaring twenties are illuminated by electric lighting and neons.

This photo suggests that whether they are static or dynamic, electronic billboards and digital media displays remediate the aesthetics and poetics of older art forms such as sculpture, architecture, theatre, cinema, and photography. This century-old photo of Times Square is an example of how, in the 1930s, architectural lighting designers used electric light as a new building material to create the effect of "nocturnal modernity", whose "roots could be traced back to the theatre" (Neumann, 12). Such a historical approach to public media displays can provide lessons from the past and thus new insights for design.

With over twenty years spent studying the humanities and making art using different media, my approach to digital public displays has been strongly informed by disciplines such as cinema, photography, studio arts, architecture and art history. **[Slide 24]** For this reason, I am interested in not only studying the social and technological potential of displays, but also their aesthetics and poetics as technological artifacts in urban space. This is why I am taking an ecological approach to urban screens. Rather than focusing on the platform, an application, a tangible device or the social space, I am looking at a whole architectural scale media environment comprising one or more digital displays that can support interactivity. This has many implications. The most important one is probably the implications it has on methodology.

[Slide 25] **Using interdisciplinarity to tailor research methodologies**

A case in point: **[Slide 26]** we have just submitted a full paper to the ACM conference *Creativity & Cognition 2013*, in which we present an ontological framework for urban screens that draws on the concept of medium specificity. Our objective is to assist researchers in developing design principles for this media space. Medium-specificity is *typically a fine arts approach foreign to HCI*.

[Slide 27] If we were to compare medium-specific properties to "affordances", we would say that the essential difference between them is that in HCI, affordances are "calls to actions" (Rogers, 9), whereas medium-specific properties refer to the intrinsic properties of a medium. Although medium-specificity emerged from a humanities-based critical approach; studio artists have used it to inform their design and art practices. It is an attempt to understand and define a medium for *what it fundamentally is on a phenomenological level*, not so much what it can do.

[Slide 28] Our approach to technology design is different than those currently used in HCI research because ours is informed by the fine arts in that it is an exploratory, open-ended and abductive approach, moving back and forth between theory and practice, and between deductive and inductive methods.

We know that the scientific method is traditionally a top-down deductive approach where theory is first conceptualized and then tested as hypotheses in controlled conditions. In HCI, methods such as design ethnography have been very popular because they offer an alternative bottom-up inductive way to extract and evaluate design principles for different computational devices.

The strength of design ethnography is that it supports the use of lived experience as the basis for design but it is also its weakness in that it places its focus on existing everyday practice, a mode of investigation which can limit the findings. **[Slide 29]** As Button and Dourish have pointed out, "its tradition is in analysing practice, rather than 'inventing the future'" (21). The scientific method of testing hypotheses is generally not credited with being a very creative method either; it tends not to be design oriented.

With this in mind, methodologically-speaking, a legitimate question would be: **[Slide 30]** "how do we invent the future" in HCI design if we are either testing theoretical hypotheses or else empirically examining existing practices?"

This is where an interdisciplinary approach can prove useful because it allows us to move a bit more freely between research methods and traditions, and maybe even blend them when necessary. For instance, my approach to research largely draws on a studio arts process informed by fine arts theory and praxis. In this tradition, it is not only acceptable, but it is also common practice to begin a formal inquiry by considering impossible, idealized concepts to inspire new design approaches and forms. **[Slide 31]** An example of this is Buckminster Fuller's utopic architectural visions. From an engineering standpoint, they were not practicable, but they did provide fertile ground for generations of architects to think innovatively about space, movement and design in general.

[Slide 32] Yves Béhar's "One Laptop Per Child Laptop" was included in last year's San Francisco MOMA exhibition, *The Utopian Impulse: Buckminster Fuller and the Bay Area*, as an example of a design artifact "inspired by Fuller's radical idealism and his visionary designs informed by technology, ecology, and social responsibility" ("SFMoma"). Buckminster Fuller's approach to design can be very roughly compared to the scientific deductive method of knowledge because they were largely theory-inspired.

Conversely, in art, we often begin our creative process inductively by working with materials and tools without a set idea of what our art piece will be. **[Slide 33]** One of the most famous contemporary artists today, 80 year-old painter Gerhard Richter, has come back to this approach after a prolific career that spans over 60 years ("Gerhard Richter").

Now if we combine these methods of conceptualizing utopic imaginings and hands-on "blind" art-making, **[Slide 34]** what we have is an abductive approach that is process-oriented, exploratory and open-ended. We would argue that we need to use such approaches to "invent the future of a technology". To do this, we also need to discover the medium and this is our rationale behind advocating the use of medium specificity in HCI.

[Slide 35] Using interdisciplinarity to put research ethics in practice

Finding the appropriate research methods to do the job is not enough because we do not want to end up doing research for the sake of research. When we set out to design new technologies, we need to know why we are doing it: What purpose will these technologies serve in the real world? How will they change our way of thinking, seeing, and doing? How will they improve people's lives? What will they do to the environment? These are ethical questions that need to be asked before and during the design process.

To answer such questions, we often need to refer to humanities and social sciences scholarship. **[Slide 36]** The humanities offer us insights from philosophy and history, answering questions such as "what have other people learned when technologies have been designed and deployed in the past?" Social sciences fields such as communication theory, sociology and anthropology, which also inform our work, typically uses empirical methods to ask these questions *in the present day* in relation to existing media and communication technologies, social structures and cultural practices.

Drawing from these research traditions is important in our work because the broader objective of my doctoral work is to see how technologies such as urban screens

can serve the public good in civil society. How can urban screens support free speech? How can urban screens enable people to form stronger communities that provide a support structure in a risk society that is increasingly competitive and unpredictable? How can urban screens level the playing field? These are real world questions that need to be addressed *while* we are designing technology, not in the aftermath.

How do we answer these questions from an academic research lab in a university department? **[Slide 37]** Researchers in the *Making Culture Lab* work with the assumption that the field, the studio and the lab form three sites of inquiry in which knowledge is produced. In our research, we seek to create overlaps and moments of encounter between the communities of practice in these three sites ("Ethnographic Terminalia 2011").

For instance, in the next year, **[Slide 38]** I will be intimately collaborating with a semi-public organization that has an important permanent urban screen infrastructure in Montreal, the only one of its kind in North America. This association is made up of representatives from non-profit organizations, urban planning, heritage associations, city hall, local businesses and government departments associated with tourism or industry. This map of downtown Montreal shows a bird's eye view of the eight buildings — marked as white blocks — that are currently being used as permanent media façades.

In our collaboration, I will be included in the meetings during which urban screen artifacts will be created. I am attending these meetings as an observer, but they are also interested in my input from a creative and critical perspective. We will be designing the research instruments together as well. In this capacity, I do believe that it will be possible for me to raise questions about ethical research as they come up, and in doing so, make ethics part of the research and development process early on.

Collaborating with them will benefit everyone. It will allow me to immerse myself in the field to produce empirical studies, but it will also allow them to be exposed to new approaches, questions and unforeseen opportunities. For instance, because I am affiliated with the *Making Culture Lab*, which supports collaborative methodologies, I intend to write some conference papers in collaboration with some of the in-house staff members of this organization, people that work at the nuts and bolts end, or at the programming end, of this urban screen infrastructure. We plan to attend the conferences together so that we can all benefit from this process. **[Slide 39]** Collaborative methodologies enable scholars and non-scholars to pull their resources and produce knowledge together.

This is an example of how we can better answer ethical questions related to the development and implementation of technology: collaborations and dialogue have to occur *within* existing real world structures, not only in labs or academic venues.

[Slide 40] Interdisciplinarity and research challenges

As interdisciplinary scholars, **[Slide 41]** the biggest challenge we have faced is to find collaborators to work with. I am not an expert in HCI. I actually know very little about computer science. When I came to SIAT, I expected it would be like MIT where artists are matched with computer scientists. It was not like that. Instead, what I saw was many interdisciplinary researchers who wanted to pursue their research alone. This is to

be expected in academia. Most researchers are solitary-types and sometimes even a bit suspicious of collaborating with others. It takes quite a bit of time and energy to get to know and trust people, and to organize team efforts.

The other challenge we have faced is finding the right publication and conference venues to present our work. **[Slide 42]** I have a good overall understanding of many research traditions and methodologies, but aside from my training in the fine arts, I have no expertise in any given field. This is a strength *and* a weakness. Being good generalists, like Marshall McLuhan, allows us to make connections between fields and mix and match methodologies in a more fluid way. Interdisciplinary researchers also tend to be very at ease with concepts and frameworks. However, in the context of academic disciplinarity, when I have tried to respond to call for papers in publications and conferences, what I found was that what editors want is often discussions on a very narrow theoretical concept or method that only scholars in that field can understand. In fact, the current trend seems to be more towards publishing florid debates about academic disciplinarity than presenting research results, especially in journals. This appears to be less of an issue in conferences.

The last challenge I have faced in pursuing research on urban screens is access to sources of funding. **[Slide 43]** One would think that having an interdisciplinary approach to a wide-reaching communication technology would mean being able to tap into a greater number of research grants. In fact, this is not quite the case. Because funding for research is organized according to academic disciplines, an interdisciplinary scholar cannot apply in overlapping disciplines that lie outside their field or department. For instance, I applied for a private scholarship to do communication research inside my faculty (the Faculty of Communication, Art and Technology), but outside my department (SIAT) in 2011. I was awarded the grant based on the description of my doctoral research and methods. However, the next day, the university took it away because it had been earmarked for the Communication Department, which had immediately filed a complaint. I understand the administrative rationale behind this, but this incident does serve to illustrate that being an interdisciplinary scholar presents unresolved disciplinary obstacles related to funding.

Conclusion

[Slide 44] To summarize this presentation, we could say that in theory, interdisciplinarity can offer researchers more tools, and open more doors to collaborate and define new research spaces. However, from my personal experience, I would add that in practice, there are disciplinary and administrative barriers that keep interdisciplinary scholars outside of certain academic journals or venues; sources of funding; and academic events and opportunities. There are also researchers that do not want to collaborate with interdisciplinary scholars because of our lack of expertise in their domain. This can make practical questions such as “What research community do I belong to?” and “What academic mailing lists should I subscribe to?” difficult to answer. Carving out a very unique research space and being tenacious in one’s effort to legitimatize this space are ways to face these challenges. In fact, this freedom and flexibility may well represent the greatest benefit of being an interdisciplinary scholar.

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