

# **Situated play in open-ended interactive art environments**

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School of Information Technology and Electrical Engineering, Australia

**Declaration by author**

This thesis is composed of my original work, and contains no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly-authored works that I have included in my thesis.

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**Morrison, Ann, Peta Mitchell, and Stephen Viller.** *Ethnography considered useful: situating criticality*. Proceedings of OZCHI 2010, Brisbane, Australia. ACM Press, 2010. [\[pdf\]](#).

There are excerpts from this paper can be found in chapter 4 and chapter 8. Stephen Viller was responsible for 10% general writing into HCI discussion, Peta Mitchell 10% for general writing and input.

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**Morrison, A.**, Oulasvirta, A., Peltonen, P., Lemmelä, S., Jacucci, G., Reitmayr, G., Näsänen, J., & Juustila, A. *Like Bees Around the Hive: A Comparative Study of a Mobile Augmented Reality Map*. CHI 2009. Nominated For Best Paper Award. [[pdf](#)]

Wagner, I., Broll, W., Jacucci, G., Kuutii, K., McCall, R., **Morrison, A.**, Schmalstieg, D., Terrin, J-J. (2009), *On the Role of Presence in Mixed Reality*, PRESENCE special issue from RAVE'09, MIT Press. [[pdf](#)]

Jacucci, G., Spagnolli, A., Chalambalakis, A., **Morrison, A.**, Liikkanen, L., Roveda S., Bertoncini, M., *Bodily Explorations in Space: Social Experience of a Multimodal Art Installation*, Interact 2009. [[pdf](#)]

Jacucci, G., Peltonen, P., **Morrison, A.**, Salovaara, A., Kurvinen, E., & Oulasvirta, A. (2009) *Ubiquitous media for collocated interaction*. In Willis, K. (Ed.), Shared Encounters. Springer Series on CSCW. [[pdf](#)]

**Morrison, A** and Salovaara, A. *Situated Engagement at a Public Urban Display*.

Situated Large Displays Workshop, Dec 5-12, Australian CHI, OZCHI 2008, Cairns 2008.

[\[pdf\]](#)

**Morrison, A** and Salovaara, A. *Sustaining Engagement at Public Shared*

*Interfaces*. ShareIT -Shareable Interfaces for Learning Workshop 2008, 11-12 September,

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## **Abstract**

The fields of Human Computer Interaction (HCI) and art are increasingly intersecting, with HCI evaluations of interactive art works and artwork that borrows technology and repurposes it for interactive environments. This intersection indicates the need for a common-ground language and set of methods that can mediate between the two disciplinary bodies of knowledge and recognise the strengths of both.

In this thesis I observe the situated, embodied and playful interaction that participants engage in with open-ended interactive artworks and devise 1) a robust, evolving methodology and 2) a common sense language that mediates between HCI and critical art practice.

The evolving methodology integrates the artist's intent into the focus of the questionnaires and face-to-face interviews, and implements a standard ethnomethodologically informed approach to ethnography as the method to observe the naturally occurring embodied action and interaction of the participants as they interact with the open-ended work. For the language, the work in this thesis builds a set of sensitising terms from the existing literature to act as guides and to direct focus of the observation. Through the grounded application of these guides, I then devise a common-sense language for multiple uses.

The contribution of this thesis is threefold. First, it provides a methodological model for the evaluation of open-ended interactive artwork. The strength of this method is that it treats each work individually and recognises the importance of the artist intent and the traditions from which the work derives. In addition, the model applies rigorous ethnomethodologically informed methods to observe the naturally occurring actions of participants as they interact with the works. Second, the thesis contributes a set of

sensitising guides and a common-sense language for 1) participants to use to describe their experience; 2) for researchers to use to code, analyse, report and discuss their findings; and 3) for inter-disciplinary researchers to use as a common-ground language. The language is useful to describe situated instances of play and modes of participation that participants naturally use in interacting with open-ended interactive works that require participants bodily interact with the work. Third, the thesis builds an understanding of open-ended free-play non-narrative environments and the affordances these environments enable. The thesis builds foundational work to add situated play as a useful construct to add to the literature on embodied and situated interaction.

### **Keywords**

situated action, open-ended, play, interactive art, ethnomethodology, HCI, Interaction Design, common-sense language, sensitising guides, installation art

### **Australian and New Zealand Standard Research Classifications (ANZSRC)**

080602 Computer-Human Interaction 50%, 190504 Performance and Installation Art 50%

## **Preface: introduction to the case studies**

This thesis is built around a number of case study works that are integral to the work done in this dissertation. I provide here a brief overview to orient the reader. The three case studies are all open-ended interactive art installations (see chapter 2, for a fuller discussion of these concepts). For case study one, *Talk2Me*, I was the primary solo artist. Case study two is four chosen works from the *Interactive Art Programme* of ACM International Conference on Multimedia 2006 (ACM MM 2006), a group exhibition. Case study three is *Space of Two Categories*, a solo work by Hanna Haaaslhati in a group show of ACM international conference on Multimedia 2007 (ACM MM 2007). The works comprise:

### 1. Case study one

*Talk2Me*, by Ann Morrison, 2005. An interactive speech activated Mixed Reality work set in a large dome space, Brisbane, Australia. This is a solo work that was exhibited in two group exhibitions (see Figure 1.1).



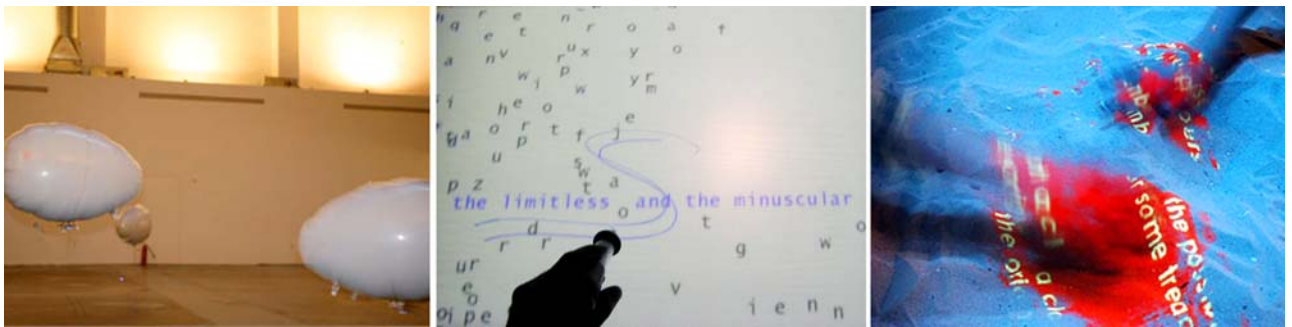
**Figure 1.1.** *Talk2Me*, Ann Morrison, 2005, Brisbane

In this work participants talk to three key word-activated virtual robots (COG, Alice, and Wall), originally devised in a virtual reality interactive writing world. This virtual world has been translated into a tangible interactive installation, housed within a 10-foot geodesic yurt dome. Participants speak through microphones, hear through headphones suspended in the

space, and view their ‘conversations’ (often random and nonsensical) projected onto the walls of the dome.

## 2. Case study two

*Interactive Art Program*, ACM Multimedia Conference, 2006, Santa Barbara, California, USA. The chosen installations were a part of a group show at the interactive art program at ACM MM 2006 conference exhibition (see Figure 1.2).



**Figure 1.2.** *Interactive Art Program*, ACM MM 2006: *ALAVs*, *Drafting Poems* and *Books of Sand*

The exhibition housed a series of interactive installation works requiring triggering by bodily interaction from the audience. For example, the audience was required to move, make a sound, make a mark, and/or respond in some way to the works, in order that the works respond.

## 3. Case study three

*Space of Two Categories*, by Hanna Haaslahti, ACM Multimedia Conference 2007, Augsburg, Germany was an interactive installation work that required the audience to interact via gesture to activate the work. This is a solo work, which was part of group exhibition at the ACM MM 2007 conference exhibition (see Figure 1.3).



**Figure 1.3.** *Space of Two Categories*, Hanna Haaslhati's, ACM MM2007, Augsburg

A series of video animations of a young girl dancing, laughing, and playing is activated when audience members move in the space. The audience can also dance and move fast to influence how and where these interactive moments happen. In this rear-projection work, the video animation of a little girl is projected onto the moving shadows of the audience members.

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# 1 INTRODUCTION TO THE THESIS

Increasingly the fields of Human Computer Interaction (HCI) and Art are intersecting, with HCI evaluations undertaken with interactive art works and artworks created that borrow technology and repurpose it for interactive environments. This intersection leads to a need for an evolving method and a common-ground language that mediates between the two disciplinary bodies of knowledge and a methodology that recognises the strengths of both. In this thesis I examine this problem area and provide a model for rigorous research that straddles respectively the borders between HCI and Art practice.

To achieve this I take three examples of open-ended interactive art works as situated case studies and observe and report on the nature of the interaction they elicit. Open-ended interactive art installations require their participants to physically explore the work and generate their own motivations for doing so. These free-form works provide an abstract yet *embodied* experience, requiring the audience to actively construct their own meaning from direct experience with the works. These are non-narrative works, with no prescribed meanings, guidelines, external goals or rules to drive the interaction. Neither is there a ready character role to adopt nor storyline to become engaged in; rather, the participants discover their own motivations and meaning and invent their own interpretations.

## 1.1 Gap in the research

The work in this thesis fits between the fields of HCI and visual arts practice and history. As yet, there is no ready-made language (or agreed methodology) to better understand the embodied and playful situated interaction that people engage in when interacting with open-ended works. The language gap exists on both the HCI and art sides. The methods and language used by HCI researchers, and the methods and language used by artists are often incompatible and difficult for the other disciplines to comprehend. For artists the focus is

generally with understanding the content, intent and motivation for building the work. For HCI researchers the focus is more standardly on the system design improvements for use, research questions and methodology used to evaluate the interactive works. Artists and those working within the arts industry (curators, art historians, theorists, critics, and writers) make, select, or write about work referring to preceding historical art works, as do HCI researchers building upon the work of experts in their field. In this way, two bodies of knowledge and their specialist languages (and methods) meet at the intersection of interactive art works. In order that meaningful communication can take place, the specialist fields require a pragmatic language to act as a boundary object (mediating between communities of practice) (Star, 1989). Additionally, *boundary spanners* are people who act as communicators, and who, spanning disciplines, work to establish common links between them. *Boundary spanners* effectively act by translating information between two or more systems whose goals and expectations are at least partially conflicting (Kitson A, 2009). Establishing a common language is one of the key issues needed to negotiate between parties in order to work across traditional boundaries and build a common purpose. (Lehrer J, 2010 Dunbar cited in )

There is other work being done in this boundary area (see 2.2) but very little work being done in regard to free play and embodied interaction in open-ended interactive art works. In this thesis I need to be mindful of my situated perspective, which is also strength of the dissertation (see 2.1.1).

## **1.2 Research aims and rationale**

The aim of this research is to observe the embodied interaction that participants engage in with open-ended interactive experiences and devise 1) a robust, evolving methodology and 2) a common sense language that mediates between HCI and art critical practice.

My aim for the evolving methodology is to integrate the artist's intent into the focus of the questionnaires and face-to-face interviews, and to implement standard

ethnomethodologically informed methods to observe the naturally occurring embodied action and interaction of the participants as they interact with the open-ended work. My aim for the language is to build a set of sensitising terms that will act as guides. I build these guides from the extensive literature on engagement, immersion, presence, play theory, and other HCI research in this gap (see chapter 3). The sensitising guides are used for observation, research and analysis in the evolving methodology.

From the resulting observation analysis, I then devise a common-sense language that is useful for 1) participants to describe their experiences: these common-sense terms can be used by participants who interact with the work, and discuss their interaction with each other, strangers at the work, the artist and/or the researcher; 2) researchers to use for practice-based intra-disciplinary research and publication: recording observations, doing analysis and writing and discussing the situated interactions; and 3) the researchers across different disciplines to be able to communicate easily with each other. The common-sense terms can then be employed as common-ground terms for use to communicate with other researchers meaningfully in inter-disciplinary research.

The primary rationale is to address where the fields of HCI and interactive art are mixing, and in need of input from each other to produce the best possible work. With my background as a visual artist, and working as an HCI researcher, I am well placed to span boundaries between the two disciplines, while being respectful of both sides of the chasm to make a genuine contribution. In this thesis, I explain the historical trajectory and impetus that has led to the sustained regeneration of open-ended art works—often minimal, non-commodity works—in changing media and many formats. Open-ended, non-narrative, predominantly minimal art works are often the most misunderstood and alienating of art works, as they do not offer easy entry or narrative closure. They are often perceived as alienating when their intent is largely to offer a meta-space for contemplation of abstract ideas and to be as inclusive as possible. Consequently, these kinds of works are largely

ignored in HCI, and to some extent in art (Bishop, 2005), particularly when combined with interactivity (Stern N, 2009). However, with the case studies in this thesis, it is the intent of the artists to create works that are as enabling as possible. The works require active and engaged participation. Open-ended interactive works require resourcefulness and initiative on the part of the audience in order to activate the works—even to the extent of providing creative input—and this is largely an untapped resource for examining the situated work of play (Crabtree A, Rodden, T, & Benford, S, 2005). Interdisciplinary work supports diversity and confronts assumptions and biases where viewpoints are in partial conflict, which produces stronger works (Dunbar cited in Jones S, 2007; Lehrer J, 2010). Clearly integration of bodies of knowledge and common-ground communication is important.

As more so-called *everyday people* are enabled, through accessible digital and hybrid tools, to create content, reasons for self-expression and needing to create become more important to comprehend, as does a common-sense language to discuss the experience and meaning (Florida R, 2002; Kitson A, 2009).

In particular, the common sense methodology and language I develop acts as a bridge spanning the two broad fields, which already house their own splits and inter-disciplines. The developers, engineers, and HCI researchers are as important to the artists working with interactive technology (providing tools and devices to progress their ideas and activity), as the artists are to the developers, engineers, and HCI researchers (pushing the edges of possibility with progressive ideas and generating leaps-in-use for the tools and devices they develop). Further, the participant audience and creative *everyday people* can use a common sense language to better understand and communicate their own impetus and experiences, The bridge that the evolving methodology and language builds not only aids the participants but also the researchers. This dissertation works beyond polemic divides to build understandings between existing bodies of knowledge in an inclusive process adding to current research working in a similar ways (see 8.2.2).



In this thesis, I am not looking specifically at interactive art per se; rather, I am investigating open-ended interaction and free play engagement in open-ended interactive art works. By studying the nature of interaction in situated playful environments, that require people to draw from their own motivations and respond creatively, I also draw conclusions on what it is that people do there and how this information may be useful to improve the design of future situated interactive technologies.

### **1.3 Contribution**

The contribution of this thesis is threefold. First, it provides a methodological model for the evaluation of open-ended interactive artwork. The strength of this method is that it treats each work on a case-by-case basis and recognises the importance of the artist intent and the art traditions from which the work derives, as well as applying rigorous HCI methods to observe, analyse and report what it is that people do there (see 8.2.3).

Second, the thesis contributes a set of sensitising guides and a common-sense language for participants to use to describe their experience; for researchers to use to code, analyse, report and discuss their findings; and for inter-disciplinary researchers to use as a common-ground language (see 8.2.4.1). The language is useful to describe situated instances of play and modes of participation that participants naturally use in interacting with open-ended interactive works that require participants bodily interact with the work.

Third, the thesis builds an understanding of open-ended free-play non-narrative environments and the affordances these environments generate (see 8.2.1). The thesis builds foundational work to add situated play as a useful construct to add to the literature that uses embodied and situated interaction to discuss the natural way that participants do the work of play and the work of situated action.

## **1.4 Structure of the thesis**

This thesis is structured as follows:

In chapter 2, I discuss art considerations and HCI considerations as a condition of the case study works. The art considerations (2.1) add background on installation art, interactive art, embodied experience, minimalism, non-narrative, activated thinking, and the impact of technology to build underlying understanding of the impetus for the case study works. Section 2.2, HCI considerations describes the current state of HCI research in relation to open-ended interaction, with many HCI researchers working in the interstices between the fields as well as artists working into HCI or research concerns.

In chapter 3, mixed reality is presented as an alternate way of viewing the case study works. The discussion moves on to cover engagement, immersion, phenomenology (a common thread throughout many disciplines in the thesis) and presence studies as the beginning of developing an understanding of situated interaction and heightened engagement in mixed reality spaces, and their relationship to interactive art. The discussion then moves into play theory and examines a wide range of literature on play, to build a set of sensitising guides to be used for observation of participants when interacting with the work. The sensitising guides build a language to better describe and define embodied actions and instances of situated play that open-ended artworks require of their participants.

In chapter 4, a recent debate focuses the methods and approaches from the two areas (HCI and art) and provides an understanding of the evolving mediation model this thesis builds from a methodological viewpoint. The evolving methodology through the three case studies is described as well as an overview of the grounded implementation process, and the changes over the duration of the three case studies. Most of the changes occur with the first three iterations of the first work, and take into account the pragmatics of the changing nature of the exhibitions (solo or group shows), the types of work and what evaluation was afforded there, and the intentions of the artist with the work.

Chapter 5, 6 and 7, are the three case study chapters. In these chapters, the works and their implementation, the evolution of the methodology, the analysis and reporting on findings is discussed in depth. A growing common-sense language to better describe the situated action of participants emerges from each case study—the terms vary according to the affordances of the environment, and to the situated nature of the participants.

Chapter 8 begins with a summary of the findings between all case studies, the emergent common-sense terms and the impact the evaluation methods made to each of the case findings. In addition, the methods implemented in the case studies and the background mixed reality research provided the foundation for a further larger study and similarities in findings are discussed. The chapter then discusses the general work of this thesis on play and open-ended environment and subsequent elevated levels of engagement, an evolving methodology and a common-sense language from the sensitising guides. The thesis concludes with future work and a summation of the contribution of this thesis.