From Transmission to Multiplicity: Interactive Art Installations as a Site for Research

Keir Smith
iCinema Centre for Interactive Cinema Research
University of New South Wales
P.O. Box 259 Paddington
2021, NSW, Australia
+ 61 2 9385 7368
keirs@cse.unsw.edu.au

ABSTRACT
Central Hypothesis: *The methods with which many contemporary interactive art installations are being designed, built and experienced is a model of multiplicity. Further, that the study of the multitudinous nature of this experience can inform our understanding of how people interact, in a computer interface mediated group situation, with both each other and the interface. The outcomes of which can, in turn, help improve how we design and build interfaces for collaborative interaction.*

This research, through a literature review, interviews with practitioners in the field and analysis of techniques and technologies the field employs, intends to show that this model of multiplicity, which I will call MMM (Multiple Modalities [for the Multitudes[1]]), is a common interactive installation art methodology. In which the single author is replaced by a group of collaborators, the single object is replaced by a multitude of objects and that, most importantly in this research, the single reader can be replaced by multitudinous collaborative viusers[2].

The technology to build computer mediated collaborative interfaces is in its infancy. The human-computer interaction (HCI) community has vast experience with the single-user, single-interface situation, but precious little with multi-user interfaces, when those users are in same local space, using the same interface. It is the intention of the *in situ* study component of this thesis can be used, in conjunction with an appropriate literature review, to remedy this deficiency in our understanding.

This research, employing a case study methodology, will investigate two works. *Conversations* a multimedia project currently being developed at the iCinema Centre and the *configurable*, experimental, interactive, multi-user same-site, installation *Socialising with Strangers* will be Then to help inform our understanding of group collaborative interaction. The technical infrastructure of *SwS* will include logging and recording software. A review of relevant research, as well as analysis of the data collected from *SwS*, *in situ*, will be combined to aid the generation of a set of guidelines for computer-mediated interactive systems for multiple locally situated viusers.

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Design, Human Factors, Theory.

Keywords
Collaborative interfaces, interactive art, human factors, and interaction and interface design.

1. RESEARCH QUESTIONS
What, if one exists, is the dominant paradigm for interactive installation art authorship, deployment and experience? What can be learned by the study of collaborative interfaces (CI), interfaces that enable collaborative interactions by their users? Can the study of CIs improve our knowledge of the interface and how to build future interfaces, and are there means in the research community to evaluate CIs?

2. HYPOTHESIS
Through a review of current literature on multimedia and interactive art, a clear understanding of the current methodologies/paradigms for interactive art creation, deployment and experience can be achieved. Further, though the case study of an archetypal work the accuracy of the conclusions drawn during the review can be empirically tested.

By developing and studying explicitly experimental artworks, works that promotes and enact collaborative interfaces, new knowledge can be gained about the capacity and capability of group to collaboratively interact with a computer interface.

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[1] I am borrowing from the notion of the empowered multitude, as set out by Antonio Negri and Micheal Hardt in Empire, to quote Negri "We think that multitude is a multiplicity of singularities, that can in no way find a representative unity". Negri opposes this to the terms 'mass' and 'people'.

[2] The word viuser is immediately seen as a simple combination of the words viewer and user, but a viuser is, in essence, a Visual Information USER.

3. OBJECTIVES

- Produce technical components of *Conversations*
- Build, exhibit and study, in collaboration with others, the work *Socialising with Strangers*
- To collate an interdisciplinary body of writings spanning art history and theory, HCI, Communications Theory, Media and Information Studies, Interface Design and individual project technical specifications, in order to identifying the current state of and trends in the particular aspects of interactive artmaking previously outlined
- Inform the Interface/Interaction Design community through the guidelines for local group computer-mediated interface and interaction

4. PROJECT OUTLINE

This thesis proposes a set of 2 quite different case studies, different in conception, technique and intended outcome. The first, that of the *Conversations* project, will be employed as an archetypal example of current interactive art installation technique, it will be used to test the prevalence of MMM's instrumentalities, once they are specified. The second case study is of the experimental work *Socialising with Strangers*, which has been specifically devised to help facilitate the design of guidelines for local group computer-mediated collaboration.

Once the development, initial display of *Conversations* is complete, this researcher will undertake, in collaboration with colleges and end users, the full development and deployment of a new work. This work, *Socialising with Strangers* (*SwS*), is conceived as a site for research, as an example collaborative interface (CI), as an experiment.

The case study of *Socialising with Strangers* will include an *in situ* study of the installation, which is in essence a configurable experimental work. This study will benefit from in the inclusion of logging and recording infrastructure in the core of *SwS*'s code[3]. By making the interface configurable different interaction paradigms, levels of feedback in the interface or levels of correlation between viuser action and onscreen reaction, amongst other ideas, can be tried and the result recorded.

5. CASE STUDIES

5.1 Conversations

Conversations is a multifaceted interactive art installation conceived by Dennis Del Favero, Ross Gibson, Ian Howard and Jeffrey Shaw, which I am working on as a contributing programmer and designer.

"*Conversations* is a distributed multi-player virtual environment. Three remotely located virtual reality stations, each comprised of a head-mounted display, a head tracker, a navigation device, headphone and microphone will provide geographically distant users access to a dynamic virtual world. The three VR stations, connected by a high-band width network will enable the three viewers to be simultaneously immersed in and navigate through a digitally generated three dimensional environment comprised of computer graphic, photographic and videographic components." [4]

Conversations, in a sense, tells the story of Ronald Ryan's escape from Pentridge Prison, in Melbourne Australia, in 1965. During the escape a prison guard was shot and killed, Ryan was convicted of the murder and hung. Ryan was the last man hung in Australia. The installation initially allows the user to witness the escape recreated in a short stereoscopic spherical movie. After they witness the escape the user is thrust into 3D graphically rendered "ghost world", where the users are can interact with key characters from the escape and it's aftermath as well as the other users experiencing the work in the other stations.

5.2 Socialising with Strangers

The aim of *Socialising with Strangers* is to create a new infrastructure for an experimental collaborative interface (CI) that allows groups of participants to interact with one another in physical and virtual space. The design and implementation of the *Socialising with Strangers* (*SwS*) infrastructure focuses on the technical 'how' of the CI rather than the (visual) 'what'. Utilising a proprietary computer vision technology to track the movements of people in the *SwS* installation space participants are able to navigate the work as it is displayed on a large projection screen. By communicating and coordinating with each other participants can initiate changes on screen, such as creating colour patterns or strategically moving objects to certain positions, as they move in space.

SwS can reward, or necessitate, interaction and collaboration between the participants present by configuring an interface that requires group interaction, and cooperation. Evaluation and feedback by participants is being incorporated as a critical element of the CI interface in *SwS*. In addition to engaging with the work through the physical interface, participants are offered the option of contributing their thoughts to the work via a video recorder. The video data collected can be used as new content and fed back into the work, as well as creating an archive of user contributions for future iterations of the work. The *SwS* infrastructure provides various possibilities for interaction and feedback, which are referred to as the *SwS* interaction variables. They can be configured by the principal artist and include, for example, how many people are required in the space to activate the work, whether all present participants in the space can effect the work, and how fast the screen image changes in response to people's movement.

In order to better visualize the physical installation I have created two online interactive demos. They can be accessed via: http://swsdemos.keirdotnet.net.

This researcher is positioned wholly between the overlapping spheres of art and science [technology/engineering]. This research imagines that the engineering of collaborative same-site systems can be improved by studying artistic interfaces/systems in art experience situations. And that, in turn, the principles/guidelines produced can be utilised by artists to create more effective interfaces or installations.

[3] *Conversations* and, in particular, *SwS* will be equipped with logging infrastructure to record people's use of the works. The analysis of this data, in cooperation with UNSW's HCI lab, is an important part of this research.

[4] http://www.icinema.unsw.edu.au/projects/prj_conversations.html