

# The Creativity and Cognition Studios

Ernest Edmonds  
Creativity and Cognition Studios  
University of Technology, Sydney  
PoBox 123 Broadway  
NSW 2007, Australia  
+61 2 9514 4640

ernest@ernestedmonds.com

## ABSTRACT

In this paper, we describe the Creativity and Cognition Studios as the University of Technology, Sydney. We give a brief overview of the work being conducted on creative uses of digital technology, advances in that technology and new digital art.

## Categories and Subject Descriptors

H 5.2 [User Interfaces]: Evaluation/Methodology, Input Devices and Strategies, Interaction Styles, Prototyping.

H 5.5 [Sound and Music Computing]: Methodologies and Techniques.

## General Terms

Design, Experimentation, Human Factors

## Keywords

Creativity, Art, Entertainment, Interaction, Generative.

## 1. INTRODUCTION

The Creativity and Cognition Studios is a multidisciplinary research group formed at the University of Technology, Sydney in 2003. The centre of its concern is the advancement of human creativity by progressing creative practice using digital technologies, the technologies themselves and our understanding of creative practice in this context.

Creativity and Cognition Studios arose from a concern for the intersection of art and technology that Ernest Edmonds and others first developed in the late 1960s. The concern flowered with the instigation of the Creativity and Cognition conference series (C&C) by Ernest Edmonds and Linda Candy in 1993. C&C is now a regular event in the Association of Computing Machinery's SIGCHI calendar, most recently held in Washington DC under the chairmanship of Ben Shneiderman [1].

In 1996, a research programme in Creativity and Cognition began at Loughborough University, UK. It was based on artist-in-residence programmes in which action-based research studies of artist and technologist collaborations were conducted. The Candy and Edmonds book, *Explorations in Art and Technology*, reports on the first few years of this work [2].

In 2003, the Creativity and Cognition Studios research moved

to Sydney Australia and has now re-formed in an enhanced form at the University of Technology, Sydney where it is part of the strategic research development of the University.

The Studios have seven academic staff members, sixteen PhD students, four research assistants and a range of national and international associated members. The group is very active in the development and running of international meetings concerned with its area of interest and the international connections in Europe, the USA and Japan are particularly strong.



Figure 1: Meeting in CCS

## 2. Themes

### 2.1 Digital Art

The research is particularly concerned with art practice using digital technologies. We do not concern ourselves much with new content in old forms but rather emphasis research into new forms that the digital technologies facilitate. The research is practice-based and is based on a reflexive relationship between the development of new creative practice and research into the computer science and human-computer interaction issues around supporting such practices. The two significant strands of our work are interaction and generative art. Interaction has been an important aesthetic goal for many years [3] and generative art has blossomed as a result of the developments relating to computers [4].

### 2.2 Interactive Entertainment

Art and entertainment are not so far apart. The distinction is as much to do with value judgments as with the concrete realities involved. In our work the particular characteristics of entertainment systems that we emphasize is the direct and fast engagement that they encourage and the use of the concept of play.

### 2.3 Creativity Support

The concern that we have is with supporting and enhancing human creativity. In recent times, this has become a hot topic in the HCI world [5]. The issue is, how can we design computer

© The Author 2008.

Published by the British Computer Society

systems that help people to be more creative. Much of the work in this area is concerned with the creativity of the general public rather than with specialist experts such as artists. In our case we are interested in the broad range of users but emphasis the artist from whom we believe we learn most about the cutting edge issues.

## 2.4 Usability and Experience

In interactive art and entertainment a most important point to understand is that the works only have real meaning in the context of audience interaction. For this reason we place significant effort into understanding audience experience. Beta\_Space, described below, provides a realistic context in which evaluation can take place. We have developed a framework which enables us to understand and investigate audience engagement with interactive art [6].

## 3. Spaces

### 3.1 Interaction Studio

The interaction studio is a space equipped with a range of computers, a high quality sound system, a back projection screen and a set of sensor systems ranging from floor pads to image processing. This space provides the core facility in which interactive artworks can be developed and evaluated.

### 3.2 Games Studio

We have recently added an exciting new space in which a wide range of game technologies are available for researchers to experiment with. An important element of the work undertaken here is artificial intelligence, which often provides the driving technology that enables the entertainment systems to deliver interesting and engaging experiences.

### 3.3 Audio/Visual Studio

Sound is very important today in most art and entertainment. We live in a multimedia world and so, in the Creativity and Cognition Studios, we have a soundproofed room in which audio work can be appropriately developed. Much of the research spans across sound and vision in the tradition that has become known as synesthesia, although we do not conduct research on the science of that subject. Rather, we concern ourselves with the tight integration of sound and image in creative artworks.



Figure 2: Beta\_Space

## 3.4 Beta\_Space

An important innovation in our work has been the establishment of a duplicate of our interaction studio in the public area of the Powerhouse Museum, Sydney. This provides two things from the research group's point of view. It is a public face for the results of our work and it enables us to evaluate audience experience within a real and public context [8]. From the point of view of the museum we provide a reliable and sustainable dynamic and changing exhibit area as well as helping them in providing high quality evaluation of audience experience.

## 4. Approaches

### 4.1 Practice-Based Research

The research undertaken within the Creativity and Cognition Studios is primarily practice-based. That is to say researchers practice their creative art and technology work, reflect upon it and experiment with it in ways that illuminate our understandings of practice. This approach is part of a long tradition developed by Ernest Edmonds and others since the mid 1970s.

### 4.2 Technology and Innovation

The role of digital technology is central to the research of the Studios. Pushing the boundaries and innovating in the technology domain is done in parallel with and as part of the research on creative practice. It is important to us that we do not simply see how we can employ the technology that we have creatively. It is equally important to develop digital technologies in ways that best support creative practice. Hence, for example, the work on artificial intelligence in the games studio is as central to our research as the development of new interactive artworks.

## 5. ACKNOWLEDGMENTS

The paper is presented as a single author contribution but clearly every member of CCS is represented and the contributions from the lively and supportive group are warmly acknowledged,

## 6. REFERENCES

- [1] *Proceedings of Creativity and Cognition*. ACM Press, NY NY 2007.
- [2] Candy, L. and Edmonds, E. A. *Explorations in Art and Technology*. Springer, London. 2002.
- [3] Cornock, S. and Edmonds, E. A. "The creative process where the artist is amplified or superseded by the computer". *Leonardo*, 16, pp 11-16, 1973
- [4] Brown, P. Special Issue on Generative Art, *Digital Creativity*, 14 (1) 2003.
- [5] Shneiderman, B., Fischer, G., Czerwinski, M., Resnick, M., Myers, B., Candy, L., Edmonds, E, Eisenberg, M, Giaccardi, E, Hewett, T, Jennings, P, Kules, B, Nakakoji, K, Nunamaker, J, Pausch, R, Selker, T, Sylvan, E, Terry, M. "White Paper on Creativity Support Tools Workshop". *International Journal of Human Computer Interaction (IJCHI)*. Vol. 20, No. 2, 2006. pp 61-77.
- [6] Edmonds, E.A. Special Issue: New directions in interactive art collaboration. *CoDesign*: Vol. 2, No. 4, 2006.