Creative Interactive Experiences as Production

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ABSTRACT

This paper examines the shift of interactive art away from user consumption towards systems for user production and artistic creation. Examples of creativity focused systems are examined in the form of the author's interactive drawing system entitled *Light Tracer* and Toshio Iwai's *Electroplankton* title for the Nintendo DS handheld game console. It is argued that in order for the user to make a creative contribution, interactive systems must afford the user appropriate freedom to create. Furthermore it is argued that, along with the aesthetic responses of such systems, the moment of interaction itself should be valued and gauged in an expanded definition of creativity and production.

Author Keywords

Interactivity, creativity, authorship, experience, production, interactive art, Electroplankton, Light Tracer, flow.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

June 2006 saw the reopening of the NTT InterCommunication centre (ICC) in Tokyo, Japan, and with it the start of an online archive of the ICC's activities entitled *ICC Hive* <http://hive.ntticc.or.jp/>. To coincide with the opening of *ICC Hive* and debate the issue of open content, a group of artists were invited to participate in the 'Open Creation' symposium.

While commending the efforts of the ICC to make its content open and viewable online, architect Usman Haque noted a more interesting shift in the focus of interactive artwork away from consumption, towards the realm of open systems intended for user production.

The fundamental change created by interactivity, from *passive* viewer to *active* user, has to date been well documented. Theorist Jack Burnham credits performance art and kinetic sculpture as 'premature attempts to expand the art experience into a two-way communication loop' [3]. Stretching further a field we can find non-physical interaction parallels within the writings of Roland Barthes [1], Umberto Eco [10] and Marcel Duchamp [9].

However Haque's suggestion of a shift from consumption to production, goes beyond the introduction of a user capable of contributing to an interactive work. He instead hints at the possibility of *artworks which produce artworks*; systems where the user can engage and themselves create.

SYSTEMS AS ART

Indeed there is an abundance of evidence to support the paradigm shift from consumption towards production. Haque's own *Configurable T-shirt* (See Figure 1), rather than offering one finished design, consists of a grid of dots which the wearer can black-out with a marker pen to create their own personalised design.

Figure 1, *Configurable T-Shirt*, **2006, Usman Haque. Designs created by the t-shirt wearer.**

Within the field of art and new media, a notable recent example is the award of a Golden Nica at Prix Ars Electronica 2005 to the programming environment *Processing*, an open source project initiated by Ben Fry and Casey Reas. *Processing* is commonly thought of as a 'tool' for the programming and production of imagery, sound, animation and so on. As mentioned in the competition jury notes [4], questions were raised about the suitability of *Processing* for the 'Net Vision' award category. In particular one member of the jury questioned whether the appropriate category should be determined by the application itself or the subsequent works authored using *Processing*.

Works such as the *Configurable T-shirt* and *Processing*, while vastly different in functionality, both point towards not just the necessity of an *active* user, but the necessity of that user to themselves contribute and make increasingly significant creative decisions.

BEYOND REACTIVE

In an interview with new media weblog 'We Make Money Not Art' artist-researcher Douglas Edric Stanley speaks of what he sees as a 'move away from specific interactive objects as an end-all, and the emergence of a culture of software, instruments, and platforms for artistic creation' [8].

Stanley introduces what he labels a *moral compass* for interactivity, evolving on the following scale:

> Reactive → Automatic → Interactive → Instrument → Platform [8].

Stanley's own work attempts to venture beyond 'the reactive or interactive object into forms of instruments and platforms' [8]. *Cubed* (See Figure 2) is a musical sequencer which uses a *Rubix Cube* as an interface. By picking up the cube, arranging its colours and repositioning it, users can create varied and complex musical sequences.
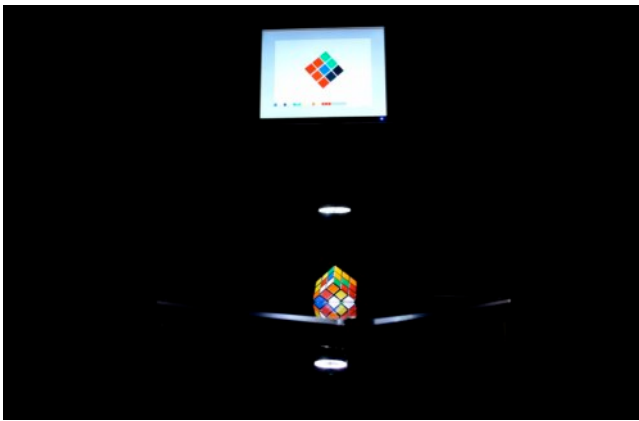

Figure 2, *Cubed*, 2005, Douglas Edric Stanley.

The resulting diversity of music that can be created with *Cubed*, positions the work away from the *reactive* end of Stanley's scale. Such reactive interfaces: 'I do X, therefore machine does Y back to me' [11], were the focus of further discussion by Haque at the 'Open Creation' symposium. In an attempt to delimit what he calls *authentic* interactivity, Haque suggested one criterion should be the impossibility for the author to predict all possible aesthetic responses that may result from user interaction.

Works which fail to offer a suitable level of choice or control to the user, have been labelled by the Massachusetts Institute of Technology (MIT) Media Labs' Andy Lippman as merely *selective* rather than *interactive* [2]. Lippman describes the Media Lab model of interaction as 'a conversation versus a lecture' [2], giving the working definition of the term 'interactivity' as: 'Mutual and simultaneous activity on the part of both participants usually working towards some goal but not necessarily' [2].

In contrast Haque labels *selective* systems the '*one-way, reactive interaction model* (ORIM) - where the "machine" contains a finite amount of information and the "human" simply navigates through an emerging landscape to uncover it all' [11]. Such models of interaction remain problematic as one of interactive art's pioneers, Mryon Kruger, stresses the need for interactivity to reman the 'focus of the work, rather than a peripheral concern' [12]. Similarly Andy Polaine, a founding member of media collective Antirom, draws a distinction between interactivity which acts as a gateway to the *real* content and interactivity as the *content itself*; such reactive systems relegate interactivity 'to a mechanism of control at best and something to be mastered and "got through" at worst' [14].

Reactive models of interaction inevitably leave little room for creativity or authorship on the part of the user, and often function as little more than an exit point for more important content or functionality.

LIGHT TRACER

The issues of user creativity and authorship have been at the forefront of my own research [18] in developing an interactive drawing system entitled *Light Tracer* (See Figure 3). The essential goal of *Light Tracer* was to create something which enabled others to create; providing an open framework to house the creative expression of the user.
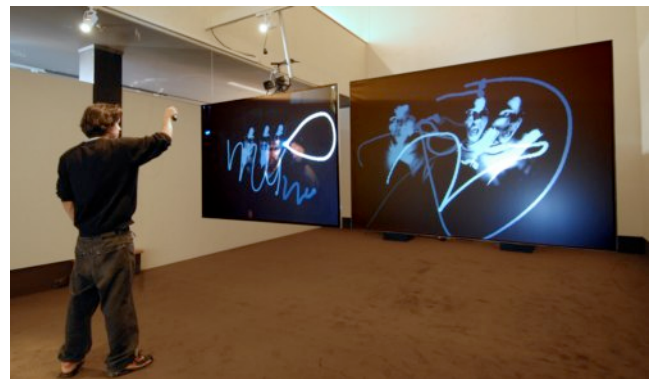

Figure 3, Exhibition view of *Light Tracer*.

In *Light Tracer* the user is situated in front of a screen reflecting their own image, and by manipulating a series of light sources provided, marks can be left onscreen such as drawings and messages as they see fit (See Figure 4).

Figure 4, Drawing with *Light Tracer*.

Brighter lights can be used to illuminate nearby objects causing them to be marked out onscreen (See Figure 5). Users can 'trace' their own face, body or hands and create realistic imagery in a simple and creative way.
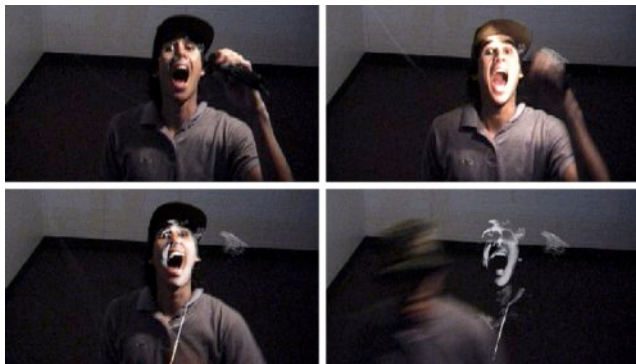

Figure 5, Tracing with *Light Tracer*.

Additionally, light emitting everyday devices, such as cellphones, lighters and camera flashes, can be used by the user to draw onscreen. Imagery created by the user is stored in layers which fade overtime, these layers are then archived and replayed on a separate display screen.

Technically the system is very simple; as the user moves the light sources across the face of the camera, the brightest areas of the camera image are extracted and recomposed onto the incoming realtime image.

How the participant uses the system is left entirely up to them, with only general aspects of the interaction (such as colour, fade time and so on) predetermined by the author.

To date *Light Tracer* has been exhibited successfully in several countries with participants creating a wide range of imagery (See Figure 6). What remains most promising about *Light Tracer* (and no doubt other similar creativity-focused projects), is that people are genuinely drawn to and engaged by the act of creating; often returning time and time again to draw and create.

Figure 6, User created imagery from *Light Tracer*.

INTERACTIVE EXPERIENCE

The stated shift from user consumption to user creativity and production is relatively easy to comprehend in the case of *Processing* or Haque's *Configurable T-shirt*, where the user produces a tangible final design or software application. However with many interactive artworks such as *Light Tracer*, the user does not produce so much as engage with and experience.

Media artist Toshio Iwai's *Electroplankton* title for the Nintendo DS handheld game console is a notable example of interaction design which crosses between production *by* the user and the creative experience *of* the user. Firstly it is important to note that *Electroplankton* can not be described as a game. Rather than the 'player' working towards a goal or objective, *Electroplankton* consists simply of interacting onscreen with a series of 'plankton' organisms to freely create sounds and music (See Figure 7).
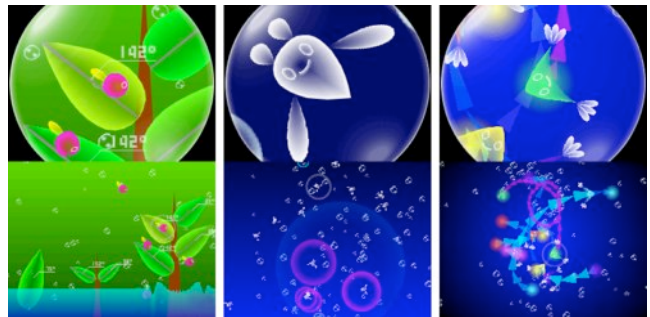

Figure 7, Screen-shots from *Electroplankton*, 2005, Toshio Iwai.

Secondly it is notable that *Electroplankton* lacks any 'Save' feature, meaning users are unable to save their creations for further development or playback. *Electroplankton* along with much interactive art in general is focused on the ephemeral moment; Iwai describes *Electroplankton* simply as 'a fun thing, a new experience' [17], 'I wanted players to enjoy *Electroplankton* extemporarily and viscerally, and I thought if the save function was added, the software would become more like a tool. I did not want a play style where players have to open additional menus or windows, or have to input file names to save' [15]. Iwai's desire to engage the user in fluid and seamless interaction in many ways relates to the experiences of Krueger and the creation of his extensive *Videoplace* system (See Figure 8).
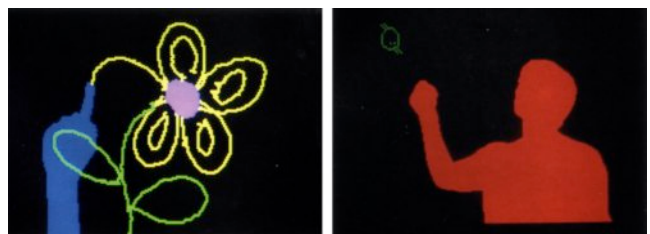

Figure 8, *Videoplace*, 1970~, Myron Krueger. Screenshots from the *Digital Drawing* and *Critter* modules.

Developed at a time when immersive virtual reality environments required users to don bulky head-mounted displays and reality gloves, Kruegers *Videoplace* stood in stark contrast, with a set-up comprising simply of a camera and screen upon which the user could see their own silhouette. From the 1970's to the mid 1980's nearly fifty 'unencumbered full-body participation' [12] interactions were produced by Krueger for the *Videoplace* system. Artist-researcher Andy Cameron notes: 'His method appears to have been a kind of restless exploration, the rapid acquisition of a whole territory and the discovery of new possessions' [5].

However Krueger's true concern, much like Iwai's, was the 'quality of the interaction' [12]. Indeed all aesthetic concerns beyond the interaction itself he claimed 'should not be judged as separate art works; nor should the sounds be judged as music' [12]. Instead he proposed to judge the interaction 'by the general criteria: the ability to interest, involve, and move people, to alter perception, and to define a new category of beauty' [12].

With works such as *Electroplankton* and *Light Tracer* the interactive experience remains the foremost concern beyond the creation of any subsequently audio or visual response. However as interactive experiences progress along Stanley's scale from reactive/interactive towards instruments and platforms, the subsequently produced works begin to take on creative attributes of their own.

A noteworthy example is the nomination of Iwai's *Electroplankton* in the Best Video Game Score category of the Music Television (MTV) Video Awards with the composer/author listed as 'User Generated Soundtrack' [13]. As *Electroplankton* does not offer a traditionally composed score as such, authorship is in this case attributed to the user rather than the creator of the system, Iwai himself.

It is in many ways unfair to compare the pioneering work of Krueger with Iwai's *Electroplankton*, given the vast differences in project aims, funding and least of all the 30 year gap between development of the two systems. While Krueger's ideas about the importance of the interactive experience are still incredibly relevant today, he has to be forgiven for failing to foresee how wide and varied a genre interactive art was to become. If, as Stanley professes, we will from here on see 'the emergence of a culture of software, instruments, and platforms for artistic creation' [8] then it goes without saying that the resulting *artistic creation* will inevitably be judged as art works themselves; as in the case of *Electroplankton's* 'User Generated Soundtrack'.

CREATIVITY AND FLOW
The aim of *Light Tracer* was to tap into the user's desire to be creative, as a means to engage them with the interactive experience itself. I subsequently found that creativity was expressed not only through the imagery created by the user, but also in the way they approached the task of drawing. Upon first coming across *Light Tracer*, users commonly

draw squiggly lines or write their names but often enough experimentation progresses beyond such simple interactions. Users quickly discover the system is sensitive to light, and proceed to write with their cellphones, lighters, or even while smoking with cigarettes. Tracing with light also produced interesting interaction, with users tracing out their t-shirt prints, found objects and quite often their exposed bodies.

At numerous stages throughout the project I questioned how *Light Tracer* differed from a software drawing application like *Painter* or *Photoshop*. Aside from the obvious physical differences, much like Iwai, I wanted *Light Tracer* to function not as a tool but rather as a fluid experience where one can be completely engaged creatively. Psychologist Mihaly Csikszentmihalyi has written extensively on the subject [6,7] of intrinsically rewarding immersive experiences which he labels *flow*. These experiences are produced when an individual's challenges are in balance with their skills and a sense of control and full immersion in the activity is achieved (See Figure 9).

While Csikszentmihalyi's research is general in nature, it can be applied to interactivity given that systems such as *Light Tracer* act as a micro-environment where *flow* experiences can be achieved.
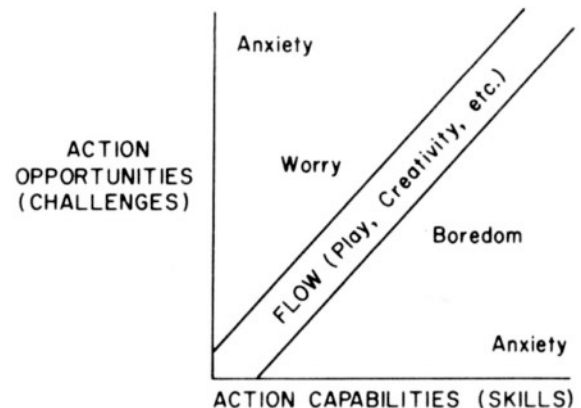

Figure 9, Model of the *flow* state, Mihaly Csikszentmihalyi [6].

From his observations of people experiencing *flow*, Csikszentmihalyi also states the importance of creativity: 'Those who are involved in more creative and less competitive activities enjoy intrinsic rewards more. However, regardless of the activity, people who perceive what they are doing as primarily creative rather than competitive, are also motivated by intrinsic rewards.' [6].

Along with the importance of creativity Csikszentmihalyi determined that *flow*, was experienced in activities which '...offer[ed] high degrees of control in rather narrowly defined areas of experience' [6]. This remains a concern for interactive experiences, as adding layer and layer of functionality can potentially become more of a distraction as opposed to a benefit; Iwai saw this line being crossed

with the addition of a save feature to *Electroplankton*. Similarly, artist David Rokeby recalls issues with early versions of his interactive sound installation *Very Nervous System*: 'In the early days of "Very Nervous System" I tried to reflect the actions of the user in as many parameters of the system's behaviour as possible... Ironically, the system was interactive on so many levels that the interaction became indigestible... I found that as I reduced the number of dimensions of interaction, the user's sense of empowerment grew' [16].

Ultimately what interactive experiences offer over tools is the fluidity of the moment of interaction; the subsequent visual or audio response then becomes a peripheral concern. What we can enter into is a conversation and a starting point for new ideas and directions.

CONCLUSION

The definition of user production within interactivity remains an open question and one which hinges upon the larger issue of what constitutes authorship in an interactive context. It is suggested that production, aside from the physical act of producing an art object, can encompass the wider realm of ephemeral creative experiences.

Interactive works such as *Electroplankton* and *Light Tracer* rely heavily on the creative contribution of the user. While aesthetically pleasing visual and audio responses can result from the use of such works, the focus remains on the experience of the interaction; in this sense the authorship role of the user is a performative one. Iwai himself has performed using *Electroplankton* numerous times, most recently at the 2006 Sónar Festival in Barcelona.

This is not to say all interactive works accommodate the level of openness required for the user to have such a creative role. With much interactive work, the goal is not for the user to create or perform, but for the system to deliver content in efficient and functional ways. Haque notes that such *reactive* systems, while 'easy for people to grasp and use' [11], allow little in the way of *intelligent*-type interactions. Haque cites the work of cybernetician Gordan Pask and suggests more generative and productive interaction is possible when it follows a true conversation metaphor with the creativity of the user and the system evident. Similarly Burnham suggests what remains interesting is how 'a dialogue evolves between the participants - the computer program and the human subject so that both move beyond their original state' [3]. This mutual evolution and sense of progression, hints at a form of collaborative creativity. As interactive art grows, changes, and evolves, we are without doubt seeing new genres and hybrid genres evolve with it. Stanley's suggestion of a move towards 'platforms for artistic creation' [8], is one such direction that is increasingly being explored by interactive artists and designers and offers fertile ground for further research and practice.

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