

## CATEGORISATION OF NEW CLASSES OF DIGITAL INTERACTION

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### Abstract

This article introduces a new concept, digital interactivity, through examining local digital culture; and video game culture is employed as a metaphor to interpret local digital culture. As a result, 'control-' and 'communication'-based interaction are initiated, based on 'user to media' relationships. Based on the degree of physical interaction, 'liminal' and 'transitive' interactions are initiated. Less physical digital interaction is described as 'liminal' interaction and more physical digital interaction is described as 'transitive' interaction. These new classes of digital interaction can be applied to real-world examples, such as digital interactive installation artworks and video games.

**Keywords:** Digital interaction, physical computing, digital media, new media, video game.

### Introduction

This article has developed from PhD research completed in 2009 entitled: "Video Game Culture and Interactivity — An exploration of digital interactive media through a metaphorical approach to video game culture." This research was focused on defining interaction within the context of digital media (installation artworks, video games and new media) and creating a multicultural definition of interactivity through examining local digital cultures. In order to understand multi-digital cultures, video game culture was employed as a 'generative metaphor' [1] to interpret local digital culture. The reason for this is that specific national cultures can be easily identified through their respective video game cultures. Four countries, South Korea, Japan, the U.S. and the U.K., were chosen as suitable Western / non-Western examples for comparison purposes, together with specific case studies, exhibitions, questionnaires and publicly accessible video game data, which were all used for formalising and analysing unique local digital cultures. This article focuses on the definitions of interaction derived from this work.

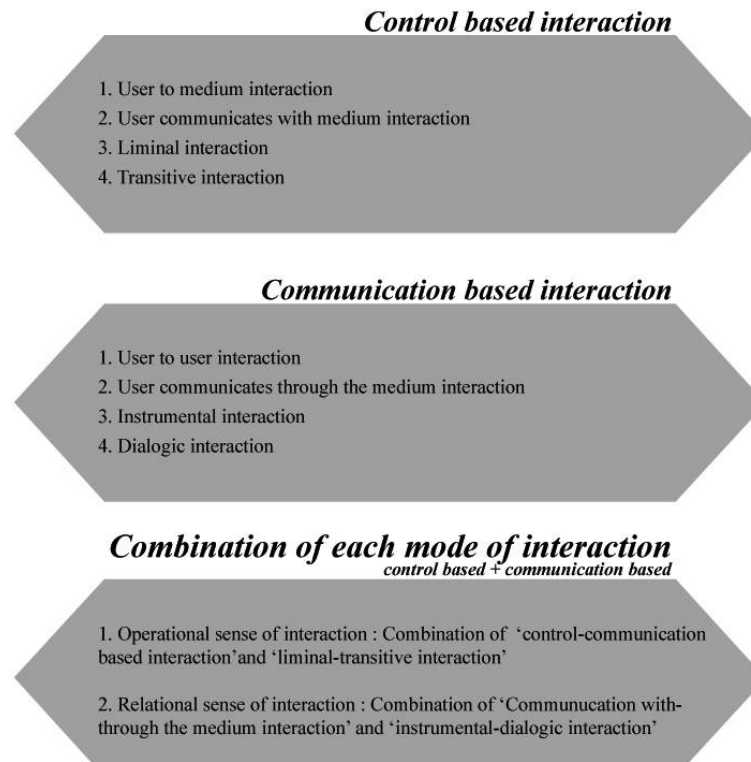


Fig. 1. Different modes of interaction. (© Tack Woo.)

The concept of a 'multi-digital culture' and a definition of interaction particularly at a local level in digital media have often been overlooked by other researchers, and this has led to the emergence of many different notions and interpretations of interactivity. As a result of these varied notions, public confusion has also arisen regarding the term "interactivity." The main purpose of this article is to re-define digital interaction and to clarify the relationship between modes of digital interaction.

### Previous Research: Concept of Control & Communication-Based Interaction

It is reasonable to state that contemporary interactive theories are based on a combination of human communication theory and the operational techniques of computer science. Because of these two different approaches, namely the sociological aspect/communication theory and technological aspect/computer science, the definition of interaction can be generally separated into two main categories, 'control based' and 'communication based' interaction. As these terms literally suggest, the communication-based interaction group is based on verbal and linguistic-based communication, which probably implies a more traditional sense of the meaning of communication. The definition of control-based interaction, by contrast, is formed by

combining non-verbal and non-linguistic communication, which involves visual and physical-based communication. Depending on the aspect on which the interaction theory is focused, differing research and definitions have been produced.

Salen and Zimmerman introduced four modes of interactivity: cognitive interactivity, functional interactivity, explicit interactivity and beyond-object-interactivity [2]. Other research, for example by Markus Friedl, which is based specifically within on-line gaming, mentions three modes of interactivity, player-to-computer, player-to-player and player-to-game interactivity [3]. Irrespective of whether we count four or three modes of interactivity, these researches tried to include both aspects of interaction, namely control and communication. Based on this, it is possible that all cases of interaction theories can be classified within three groups of interaction, namely a control-based interaction group, a communication-based interaction group and a combination of the two (Fig.1).

### New Research: Concept of Liminal and Transitive Interaction

Where the relationship between users and the medium is less physical or the controlling mechanism is established in the conventional sense of a controller, this type of interaction can be defined as liminal interaction. For example,

when a user uses a conventional joy-pad in a football video game, pushing a button can be regarded as a metaphor for kicking a ball.

When compared to liminal interaction, transitive interaction is considered as a more physical transaction between the user and the medium. Current physical computing systems can be considered as transitive interaction. In physical computing, the user's actions are always an important part of the interaction itself. As previously mentioned, all types of physical computing, which use sensors / actuators to operate digital media, can be defined as transitive interaction. Nintendo Wii's physical interactive controlling packages are good examples of transitive interaction devices. It is, of course, when the user is using the Wii controller, that the latter's movement should be considered as being a part of this interaction.

### New Concept

When the designated meaning of control-based interaction and communication-based interaction intersects with liminal and transitive interaction, this mode of interaction can be referred to as the 'operational' sense of interaction. The main purpose of this mode of interaction is to observe the interaction situations more from an operational context. Instead of focusing on the sociological concept, this mode of interaction is determined by the physical computing. In this case, the literal meaning of the communication only takes a minor role in the selection process and is not considered as a primary function. A core part of this mode is the process of the action and reaction mechanism, which is also referred to as

the use of the degree of interaction in the controlling aspect. Depending on the degree of the user's control, sense of involvement and primary function of the interactive media, whether non-communicational or communicational, each situation of interaction can be defined differently. For example, control-based transitive interaction, control-based liminal interaction, communication-based transitive and communication-based liminal interaction are used to define the situation of interaction by this mode of interaction (Fig.2).

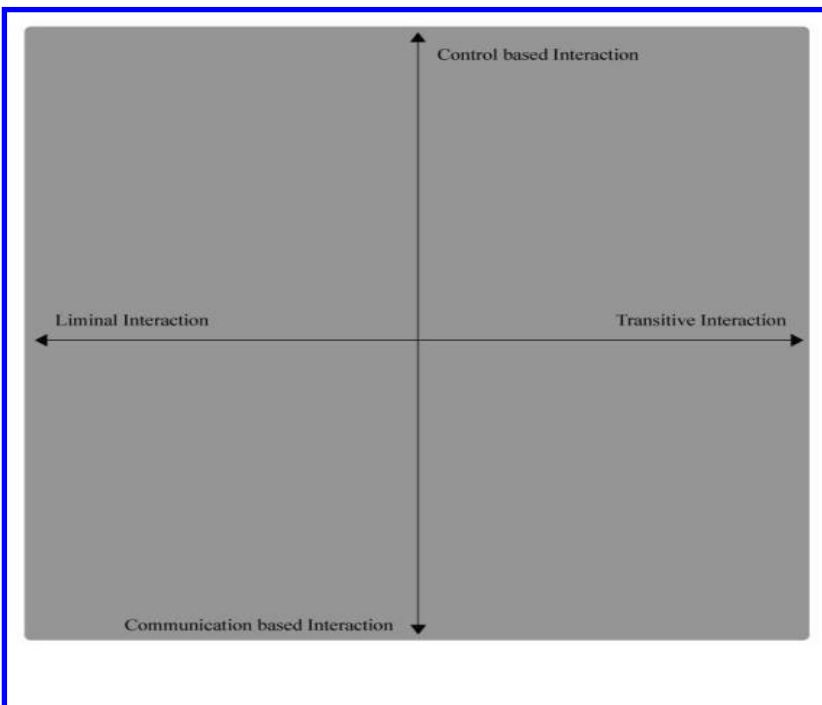
### Conclusion

These new concepts of digital interaction can be employed as definitions of 'interactive' in digital media. Unlike sole-purpose conventional definitions of digital interaction, these new definitions are established in relation to multi-digital cultures and are flexible, so that they can be modified for specific digital cultural models. For example, Manovich focused on user-to-media interaction [4], and user-to-user interaction was not mentioned within his definition of interaction. Other scholars, such as Salen, Zimmerman and Friedl, held concepts that contained user-to-user interaction, which can be defined as 'communication based interaction' [2, 3]. It is clearly more flexible than Manovich's concept but they did not contain differences of degree of physical interaction. For this reason, the aforementioned previous concepts of interaction are regarded as 'sole purpose' and less flexible than new concepts and classes of interaction which can be described as follows:

- **Control-based interaction:** this type of interaction is focused on the audience-medium relationship; thus, in this type, audiences communicate with the medium.
- **Communication-based interaction:** this type of interaction is focused on the audience-audience relationship, which is built on digital media; thus, in this type, audiences communicate through the medium.
- **Liminal interaction:** the relationship between audiences and the medium is less physical; hence, the controlling mechanism is established in the conventional sense of a controller.
- **Transitive interaction:** the relationship between audiences and the medium is more physical; hence, the controlling mechanism is established by the use of various physical sensors.

Digital culture is on-going, a still-evolving culture, and the public's notion of digital interaction is also continually evolving. As this article indicates, the traditional cultural categorising method is no longer applicable. This new category of culture requires a new type of approach. These newly defined notions of digital interaction, which are based on unique concepts of digital culture and a sociologically motivated new meaning of 'local,' may assist in this difficult task. For example, these new approaches can support video game creators and artists to understand concepts of digital interaction and develop culturally wider audience-targeted projects. The most important aspect to be considered is that digital culture cannot be considered without being concerned with 'local' digital culture. Although this 'local' digital culture has many variables and is difficult to define, the solution to this problem always lies in reflecting the choices and preferences of the relevant user groups and 'local' general public.

Fig. 2. New classes of digital interaction. (© Tack Woo.)



### References and Notes

1. C. Gray & J. Malins. *Visualizing Research* (Hampshire, England, Ashgate Publishing Limited 2004).
2. K. Salen & E. Zimmerman, *Rules of Play* (Massachusetts : The MIT Press 2004).
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4. L. Manovich. *Language of New Media* (Massachusetts: The MIT Press 2001).