

Learning from Traditional Dynamic Arts: Elements for Interaction Design

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Abstract— *Understanding traditional dynamic art forms can inspire interaction design for public spaces. This paper attempts to identify the elements in traditional dynamic art forms that could contribute to the design of interactive public art installations. We show an example how these elements can be utilized by designers in a projection-mapping installation to generate concepts for interactions and experiences in public spaces.*

Keywords— *dynamic art forms, public spaces, design research, interaction design, interactive installations*

I. INTRODUCTION

There are a few studies [1-3] introducing dramatic theories and techniques, offering new perspectives into the traditional methods, but in our knowledge offer no clear solution or input for contemporary design of interactive public arts. The attributes of new media are simply not taken into account. Laurel attempts to provide new possibilities of interaction based on theatrical theory [2]. She focuses on how to emphasize technological aspects over dramatic theater plays, like adding sound, color, motion and the role of spectators. With regard to the roles of participants or users of an interactive system, Dalsgaard and Hansen divide them into operators, performers and spectators based on the performance (theater) theory, phenomenology and sociology [1]. They address the existence of re-identified concepts of performative spectator and spectating performer and argue that the user is simultaneously a 3-in-1 role shaping her understanding and perception of her interaction. Rajmakers et al. choose documentary films to inspire design research in HCI [3], despite not identifying theories and techniques from traditional operas, movies and contemporary art as inspiration for interaction design for public spaces.

The traditional dynamic arts have much to offer and it is time to explore how the theories and techniques from drama, film and opera could contribute to interaction design. The main objective of this paper is to explore new opportunities in the context of interactive experience design in public spaces. We first look into the traditional dynamic arts and identify a series of interesting elements that could be inspiring for interaction design, followed by a case study that shows how these elements were applied in the practice of the ALONE ALONG project.

II. DYNAMIC ART ELEMENTS

A. Different roles in performance arts: operators, performers and spectators

Participation in an interactive experience, especially when it comes to happenings in public spaces, is about: *what one does is experienced by someone else, and that the others are seeing and experiencing that one is experiencing something* [1]. So, the participant of an interactive public art installation is more than a passive user. Participating in creating [4] and interacting [5] with a public art installation is about transferring roles among the roles of operator, performer, and spectator at any time. On many occasions, participants are both operating and performing, and one is also a spectator of actions of the others.

B. Different attention spaces: foreground, mid-ground and background from unfocused to focused

This technique in managing the attention of the audience can also be effective for interaction design for public spaces: getting the attention of the public is usually a challenging task especially when the installation is surrounded by crowded and busy elements in an open space, such as buildings, lights, plants and busy people. Dividing the space of the interactive public art installation into foreground, mid-ground and background could help get attention from people in noisy and distracting surroundings.

C. Front stage and backstage in time and in space

Every public space could be seen as a stage. When a participant faces an interactive art installation, she is already performing on the front stage. While she does not know what is happening on the backstage. Sometimes interactive designers deliberately blur the difference between these two stages. But if the backstage is open to the participants as well, interaction and experiences in public space could be much more interesting as the meta-level of the “making” also plays a role, and this might even deliver a completely new experience.

Talking about interaction design in public spaces, what is possible in a given environment? It can be an experience of two folds: the first is the stimulation to imagination and emotion that is created by carefully crafted uncertainty. The second is the satisfaction provided by closure when the play is completed, if the plot has been successfully constructed. The experience unfolds over time.

D. Use of dramatic language.

Dynamic art forms expand the understanding about language, which is beyond the natural languages. For the interactive public media arts, language is reflected by not only words, but also other nonverbal media such as sound, signs and symbols, all of which play the roles that can have similar expressive power.

E. Tension: Controlling the Rhythm of Interactive Public Design

In a theater performance, we expect to have an experience from the beginning, to the end, in which the tension is gradually built up, until the climax, and then is released. Dynamic interaction of all protagonists mixes peaks and valleys [2] in a rhythm that starts from an introduction, rises to a climax, then falls to a slight return, and finally gets a conclusion. However, in the actual interactive process there might not be any clear boundary. The conclusion could act as the introduction for the next round of the next climax building up process, forming a spiral of climaxes.

Next, the project ALONE ALONG is presented followed by a discussion about how these elements learned from traditional dynamic arts could shape the user's experience.

III. CONCEPT AND PROTOTYPE

ALONE ALONG is an interactive installation designed for the office environment. It is an interactive media art installation with front projection into a cardboard made "train window" (Fig.1(a)). The concept is to install this digital train window on the different floors in the office environment. If there are two people passing by the windows at the same time on different floors, they will be able to see each other and wave to each other. In the design of this installation, the elements learned from the traditional dynamic arts are applied. During the interactive process, the participant is moving from her office (back stage) to the corridor (front stage). This participant's experiences on two stages are expected to be different – from being stressful on the back stage to being surprised and hopefully delighted on the front stage.

When the participant is on the front stage (the corridor), she is at the beginning a spectator. She watches the video in the train window on the wall (Fig.1(b)). Then she becomes a performer when she starts interacting with the video by walking faster or slower and by stopping in front of the window. When she sees her colleague appearing in the scene, she waves to him and expects him to wave back – she becomes a protagonist to influence the behavior of the others. This role changing process shapes her interactive experience in a richer and a more subtle manner.

In this work, the corridor, where the participant "performs", is the foreground. The colleague appearing in the window is in the mid-ground. The landscape or platforms from the film would be in the background. When this performer sees the colleague appearing in the train window, waving at each other is the interaction between foreground and mid-ground. At the same time, the mid-ground becomes the foreground for the colleague and Yang's foreground becomes the mid-ground for him – the intertwined views gives opportunities and

perspectives for the designers to tweak and tinker their ideas and concepts.

Moreover, dramatic languages are used to make the interaction and experience richer and more interesting. For example, background music, fast moving scenery and the familiar landscape are used to attract the user's attention. The content of video changes from fast-moving landscapes to arrival platforms of a train station.



(a) "train window"

(b) Participant passing by the "train window"

Fig.1. ALONE ALONG

IV. CONCLUSION REMARKS

This paper identifies a few key elements in traditional dynamic art forms that could contribute to the design of interactive public media art installations. The design of the example project "ALONE ALONG" highlights how these elements could introduce new perspectives into contemporary interactive forms and expressions, by carefully staging the tensions between being a performer and being a spectator, among foreground, mid-ground and background, between the front stage and the back stage, and among different dramatic expressing languages.

More work needs to be done to identify more of these elements and organize them into a clearer structure, and to investigate not only how these elements could be applied in an interactive design, but also how the creation process of these elements in the traditional dynamic arts could be applied in the process of creating ideas and concepts for interaction design of public media arts.

REFERENCES

1. Dalsgaard, P. and L.K. Hansen, *Performing perception—staging aesthetics of interaction*. ACM Transactions on Computer-Human Interaction (TOCHI), 2008. **15**(3): p. 13.
2. Laurel, B., *Computer as Theatre: A dramatic theory of interactive experience*. 1991: Addison-Wesley.
3. Raijmakers, B., W.W. Gaver, and J. Bishay. *Design documentaries: inspiring design research through documentary film*. in *Proceedings of the 6th conference on Designing Interactive systems*. 2006. ACM.
4. Hu, J., et al., *Participatory Public Media Arts for Social Creativity*, in *Culture and Computing*. 2013: Kyoto.
5. Wang, F., J. Hu, and M. Rauterberg, *New Carriers, Media and Forms of Public Digital Arts*, in *Culture and Computing 2012*, Springer-Verlag Berlin Heidelberg: Hangzhou, China. p. 83-93.