Scripting Interactive Art Installations in Public Spaces

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Abstract. Traditional dynamic arts have much to offer and it is time to explore how the elements and techniques from stage performances could contribute to interaction design. We try to apply performance techniques and elements from dynamic art forms in the design process of interactive art installations for public spaces. Currently we try not to identify new technologies; instead we investigate how the installation would blossom when approached from a performance art perspective that essentially includes the users as well as a broader physical or social context. This paper introduces the role and function of script in the field of interactive art installation in public spaces. Script inspired from traditional dynamic art forms opens up new design opportunities. This paper discusses these opportunities, followed by an example how this approach can be applied in the design of a public art installation.

Keywords: Interactive Art Installations, Public Spaces, Script, Traditional Dynamic Art Forms.

1 Introduction

There are a variety of different forms of dynamic performance events, including theatre, and opera. These performance events use production equipment and techniques such as staging, scenery, mechanicals, sounds, lighting, video, special visual effects, communications, costume and makeup to convey an experience that are often scripted in advance to the live audience. This is similar to interaction design, the goal of which is in many cases, if not all, to convey a creative experience that is designed in advance to the users.

The main objective of this paper is to explore new opportunities in the context of interactive experience design in public spaces. We first list series of interesting elements from dynamic arts that could be inspiring for interaction design, and then focus on script, followed by an example of scripting interactive art installation. The example shows how script can be applied in the interaction design.

2 Elements Inspired from Traditional Dynamic Art Forms

In earlier publications [1] we have identified a few key elements inspired from traditional dynamic art forms that could contribute to the design of interactive public media art installations [2].

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2.1 Stagecraft

Stagecraft in traditional dynamic arts includes lighting (e.g. different lighting effects used to change or enhance mood), costumes, makeup (e.g. in Beijing Opera, different colors of facial makeup identify different personalities of roles), props, stage management (e.g. on the stage how to set the positions of props and actors) and recording and mixing of sound. However, in the actual interactive process there might not be any clear boundary between stage space and audience space. The space could include the spread of stage and the combination installation itself and its surroundings, as well as the participants. For the interactive public media arts, stagecraft is reflected by not only arrangement on the installation itself, but also management about whole environment and all possible participants. In interactive design, stagecraft is added technological elements, for instance designers use new multimedia tool, like photographs, video, or projector to make media art installations.

2.2 Different Roles in Performance Arts: Operators, Performers and Spectators

The participant of an interactive public art installation is more than a passive user. For example, participation comes to an interactive experience happened 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[3]. One of ways of participating in creating and interacting[4] with a public art installation is to transform roles among operator, performer, and spectator at designated or preferred time [1]. On many occasions, participants are both operating and performing, and also are spectators. On some occasions, operators (designers or artists) could be performers.

2.3 Different Attention Spaces: Foreground, Mid-ground and Background

Getting the attention of the public is usually a challenging task especially when the art installation is in an open space, surrounded by 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 random surroundings [1].

2.4 Front Stage and Back Stage in Time and in Space

Every public space could be seen as a stage. We defined the space of interactive art installation which is on front stage and other invisible components on back stage (like organization, supervision, mechanical devices, managers, etc.) When a participant on the front stage, she does not know what happened, is happening or will happen on the backstage. Sometimes interactive designers deliberately blur the difference between these two stages. That's sometimes why we can see mechanical devices be moved to the interactive space and opened to the public. On this kind of occasions, 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” [1].

Next, based on these elements learned from traditional dynamic arts, we also find how to script well above-mentioned elements and how to make a “script” in the process of designing installation could shape the user’s experience.

3 Scripting Interactive Art Installations in Public Spaces

3.1 Script and Scenario

If we look through passing thousand years of history of traditional dynamic arts, like drama, script is the base of traditional dynamic arts, which mainly composed of lines and stage directions. Scripts use dialogue, monologue, narrations or librettos as first-person narrators to represent the development of stories. Furthermore, in drama, the stage directions in the script are a kind of narrative text which is based on the tone of the writers. These directions include the story of the time and the place, the arrangement of image characteristics, body movements and activities in the real scene, description of the atmosphere, as well as the stagecraft and other requirements. In the history of drama, the script appears roughly officially formed and mature drama. For script writing, the most important aim is to be performed on the stage, not just as literature text. It could become only half finished until after the stage performances (e.g. "show text") is the ultimate artistic rendering. Yet the actors can perform on stage based on the original script, with necessary changes or modifications according to every different stage, and different understanding of the actors themselves as well. Therefore, script has an important function that allows modification, and during the process these modifications would produce detailed annotation, and mark a passage in the script how to work with the real show script.

A script often falls into a theme. The most common contemporary understanding of the theme for a script is an idea or concept that is central to a story, which can often be summarized in the “path of life” [5] (e.g. for “birth”, for “communion”, and for “passing on”). “In all religions and cultures there was this understanding that life happens in distinctive eras with each a specific content, that there are thresholds that give entrance to it and that it is important to cross them consciously and with the right effort. When the time was right the community prepared together with that person, symbolized the transition to procure conscious life.” [5] An example of this would be in Harry Potter film series. The theme of script for *Harry Potter and the Philosopher’s Stone* is death while *Harry Potter and the Goblet of Fire* is prejudice. Every show-work always has a theme even when it is just a script. Motif and expression are two parts for one script, including “What the work says about the subject” and “what the audiences think the work is about”. One of these two parts can sometimes overwhelm the other one depending on interpretation and performance.

Scenario is a close concept to script which is the description of one piece or one possibility of series of actions and events depending on the story context. It is used in different kinds of areas (like military, politics, design). A scenario is often developed initially to indicate how the original source, if any, is to be adapted and to summarize the aspects of character that can be expanded later. To some extent, scenario could be look as the outline of scripts.

In interaction design, an interaction scenario is "a fully specified design vision: the users and task(s) being supported, the information needed to carry out the task, the actions the users take to interact with the task information, and the responses the system provided to users actions" [6]. Scenarios often play an important role in the process of concretization of a design concept by specifying a story to construct and illustrate the design concept or design solution [7]. Scenarios may be related to use cases and help focus design efforts on the user's requirements. Scenarios can be understood by people who do not have any technical background. They are therefore suitable for being used during participatory design activities.

Nevertheless scenario planning has several notable limitations [8]:

> "1: One criticism of scenario commonly used is that resulting results in somewhat arbitrary scenario themes.
>
> 2: Apart from some inherent subjectivity in scenario design, the technique can suffer from various process and content traps.
>
> 3: A third limitation of scenario planning in organizational settings is its weak integration into other planning and forecasting techniques."

According to the comparison, we can find that scripting interactive art installations in public spaces can make up for the limitations of scenario. That's the reason for us to introduce script instead of scenario in designing interactive art installations in public spaces. Designers sometimes need to predict all possibilities before the design process and confront with traps during the design process, at this point, script could help designers push concepts much deeper and make the concepts to be fulfilled as closer as their purpose. This kind of sketching technique can be helpful in pitching the idea to a prospective producer, director or composer.

3.2 Script in Traditional Dynamic Art Forms

In traditional dynamic arts, script is the instructions for actors to perform a play. It includes the lines each of the actors must say, some indications of stage actions (also called stage directions) and the description of surroundings. While script for traditional dynamic arts specifies normal lines or stage directions, interpretation and performance techniques can vary. How to attract attention is one part of script. In ancient time for both eastern opera and western drama, theatrical performance always took place in a noisy and crowded open and public space with a rudimentary stage,

which is different from the situation nowadays in quiet and well organized theaters. Ancient troupes also found effective approaches to attract audiences and you also can find this kind of instructions in the script. They would repeatedly remind the audience of the happened plot in latter scenes. An actor would wear a plate with the name of the character, so that the audience could easily find the character relationship at any given time. Also, at the beginning, they would use the long lines to introduce the development of whole story. A unique technique often used in Beijing Opera is that, before the opening, the protagonist would always sing shortly on the back stage before appearing on the front stage, to prepare the audience, raise the expectation and set the mood. In traditional dynamic arts, these aforementioned performance techniques are one important part of script, which also is the main reason for us to introduce script to design of interactive art installation

3.3 How to Transform Script into Interactive Art Installations in Public Spaces

We have tried to apply performance techniques and elements from dynamic art forms in the design process of interactive art installations for public spaces [1]. As a stage play needs a script, do we also need a script when we design an interactive art installation for a public space? What is the role and function of such a script in the design process and in the designed installation? And how much space we shall leave in the script for the interpretation and performance?

3.4 Opportunities and Challenges

For interactive art installations in public spaces, we are facing the same problem of noisy environments and often crowed audience. Scripting interactive art installation can be a possible solution to tell participants something will happen or something already happened to the audience that joins and leaves at any time. To a certain extent, script helps extend the time. Extending the time here, not just extending the time for interaction process, also about extending the time for expectation and time for traces after interaction. For a dynamic audience, we would also expect the scripting, interpretation and performance techniques could help to extend the experience from one audience to the other. For example, interaction with the installation by one audience would leave trace to the audience later. Traces could be the non-verbal and emotional information [9] left by people. Traces can also mean the full sensorium of experiences felt by people as they encounter smells, footprints, shadows, coughing sounds, talking, and so on, left behind by people who have previously pass through the installation space. It's also called "experience of involuntary memory". This also could be one part of script designed at beginning.

Next we show a concrete example of applying these scripting, interpretation and performance techniques in the design of one interactive public art installation named "Consistency". This installation is the result of a three-week international workshop joined by 9 teams of Dutch and Chinese design students, in the concept of "interactive patina of culture" [10].

4 Concept and Implementation

4.1 Concept

"Consistency" is an interactive art installation that is based on the principle of YinYang and acts as a reminder to this ancient philosophy. It is one of projects from the 3-week international workshop in Taicang, China, during 21Oct. and 8 Nov. in 2013. The place for this installation is chose in the center of Taicang, which is a public square and located next to a river, surrounding by green trees. Even it is in the city center, it is still a peaceful and quite location. In the center of this square, there is a circular platform a bit higher than the ground which makes the whole square looks exactly like an opening stage.

YinYang is an ancient Chinese philosophy that is deeply rooted in the Chinese culture and acted as a guide in people lives. YinYang is about finding the balance through breaking the balance. In Daoist philosophy, "All things submit to Yin and embrace Yang. They soften their energy to achieve harmony." as stated in the Dàodéjīng at chapter 42. And in chapter 2, it also said, "Presence and absence produce each other. Difficulty and ease bring about each other. Long and short delimit each other. Highness and lowness rest on each other. Sound and voice harmonize each other. Front and back follow each other." Light and dark, high and low, hot and cold, fire and water, life and death, etc. can be defined as Yin and Yang here. Yin and Yang, both of them transform each other, they also exist together. Hence the installation is named "Consistency".

Based on this understanding, in our project, Yang is treated as solid matter and Yin as liquid, which are hard and soft, being two opposite elements. We continued to consider about the surroundings, connecting this abstract philosophy to the exact public square, using the overlap circle sculpture on this square and the river next to the square, pushing this concept into an interaction in which one can leave traces in the sand (Yang and also solid) and over time the water (Yin and also liquid) will erase the traces you left behind (Fig.1).

As we mentioned before, script has an important function that allows modification, and during the process these modifications would produce detailed annotation. After the theme of our project (Consistency) was made clear, we used a step-by-step script to build up a construction for this installation and combined different implementations.

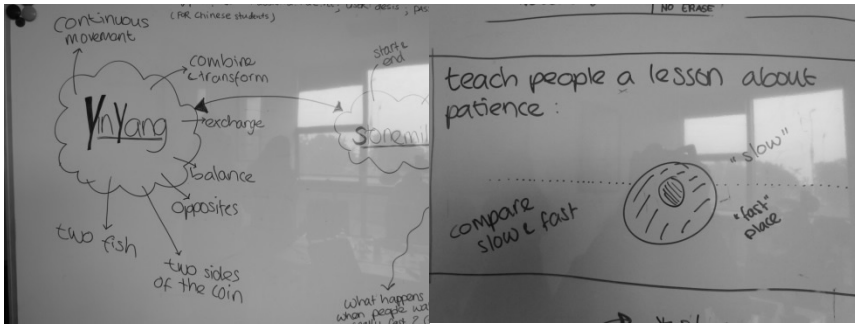

Fig. 1. Outlines of concept about YinYang

Script step1. The installation is triggered by the implicit and explicit behavior of people. As someone walks alongside the circle, water ripples appear on the water as if they are triggered by the steps of the person (Fig.2).

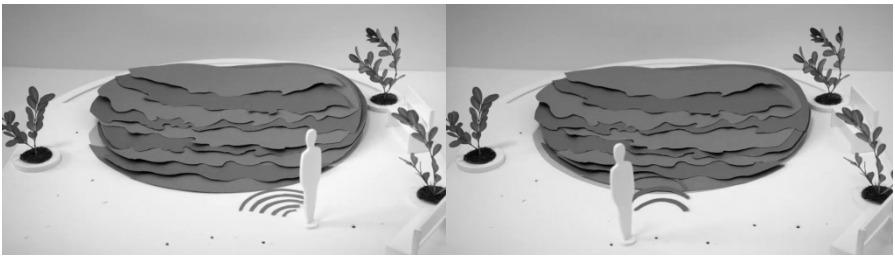

Fig. 2. Script step1

Script step2. Step 2 is based on the script step 1. After someone walks alongside the circle, water ripples appear on the water. This person enters the circle, the water retreats to the opposite direction and the sand becomes visible. By the person walking around footsteps appear on the sand (Fig.3).

Fig. 3. Script step2

Script step3. Step 3 is based on the story of script step 2. As someone walks alongside the circle, water retreats appear on the water. As a person enters the circle the water retreats to the opposite direction and the sand becomes visible. By the

person walking around, footsteps appear on the sand. After the person leaves the circle, the water comes back and slowly erases the created footsteps. Multiple participants can cooperate on the circle to find new ways to create footprint patterns and play around with the balance of the opposite elements (Fig.4).

After these 3 steps, we had a detailed construction for concept. Then we prototyped the construction, adding vary stage directions, interpretation and performance techniques.

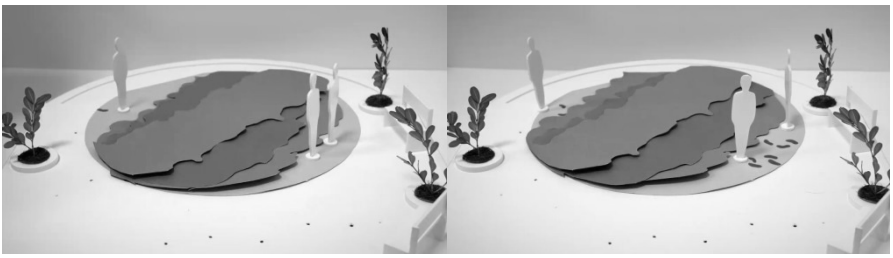

Fig. 4. Script step3

4.2 Implementation

During the 3-week workshop, we did a small-scale prototype to realize our concept. This small-scale prototype implements the interaction between people and installation on the square, and the effect of movement. Infrared distance sensors are used to detect the speed and direction of the movement. In this prototype, viewpoints of sand and water, footprint left on the sand and movement of water are all visualized by projection mapping (Fig.5). We also made gravity mechanisms on the bottom of this prototype, the whole central circle part would be slightly tilted depending on the number of audiences and positions of audiences.

Fig. 5. Final prototype

5 Conclusion

Based on the previous research on interactive art installations in public spaces inspired from elements of traditional dynamic arts, in this paper, we tried to introduce script as a new element to the design process. The design of example project highlights how this element could introduce new perceptive and new possibilities into the expression and forms, by giving detailed story, considering implementation, bringing in different results and controlling the tension and theme of the whole interaction process, and trying to offer different experiences for participants.

The script in the example is minimalistic. We have not yet tried whether the script shall be formulated in the similar forms of lines and stage directions. More work needs to be done to identify more of script for the design of interactive art installations in public spaces and organize it into a clearer structure, and to investigate not only how it could be applied in an interactive design, but also how the creation process of script in the traditional dynamic arts could be applied deeply in the process of creating ideas and concepts for interaction design of public media arts.

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References

1. Zhang, Y., Gu, J., Hu, J., Frens, J., Funk, M., Kang, K., et al.: Learning from Traditional Dynamic Arts: Elements for Interaction Design. In: International Conference on Culture and Computing, Kyoto, Japan, pp. 165–166 (2013)
2. Hu, J., Wang, F., Funk, M., Frens, J., Zhang, Y., Boheemen, T.V., et al.: Participatory Public Media Arts for Social Creativity. In: International Conference on Culture and Computing, Kyoto, Japan, pp. 179–180 (2013)
3. Dalsgaard, P., Hansen, L.K.: Performing perception—staging aesthetics of interaction. ACM Transactions on Computer-Human Interaction (TOCHI) 15, 13 (2008)
4. Le, D., Funk, M., Hu, J.: Blobulous: Computers As Social Actors. In: Experiencing Interactivity in Public Spaces (EIPS), CHI 2013, Paris, pp. 62–66 (2013)
5. Vissers, M., Wang, F., Baha, E., Hu, J., Rauterberg, M.: Path of Life in Mixed Reality. In: Culture and Computing, Hangzhou, China, pp. 216–227 (2012)

6. Rosson, M., Carroll, J.: Usability engineering: scenario-based development of human–computer interaction. Information Research 8 (2003)
7. Cooper, A., Reimann, R., Cronin, D.: About face 3: the essentials of interaction design. John Wiley & Sons (2012)
8. Sadri, S., Sadri, J.: Case Writing and Scenario Planning as Instruments of Corporate Training: An Exposition. BVIMSR's Journal of Management Research, 16–17 (2009)
9. Nakatsu, R., Rauterberg, M., Salem, B.: Forms and theories of communication: from multimedia to Kansei mediation. Multimedia Systems 11, 304–312 (2006)
10. Frens, J., Funk, M., Hu, J., Zhang, S., Kang, K., Wang, F.: Exploring the Concept of Interactive Patina of Culture. In: 8th International Conference on Design and Semantics of Form and Movement (DeSForM 2013), Wuxi, China, pp. 211–124 (2013)

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Table of Contents – Part I

Design Theories, Methods and Tools

Psychological Personas for Universal User Modeling in Human-Computer Interaction 3
Caio Felix de Araujo and Plinio Thomaz Aquino Junior

Immediacy in User Interfaces: An Activity Theoretical Approach 14
Sturla Bakke

The Resilience of Analog Tools in Creative Work Practices: A Case Study of LEGO Future Lab's Team in Billund 23
Nanna Borum, Eva Petersson Brooks, and Søren R. Frimodt-Møller

Using Cultural Probes to Inform the Design of Assistive Technologies ... 35
Michael Brown, Allen Tsai, Sharon Baurley, Therese Koppe, Glyn Lawson, Jennifer Martin, Tim Coughlan, Meretta Elliott, Stephen Green, and Unna Arunachalam

Is There HCI in IDTV? An Exploratory Study on Their Words 47
Samuel B. Buchdid and Maria Cecília Calani Baranauskas

A Knowledge-Construction Perspective on Human Computing, Collaborative Behavior and New Trends in System Interactions 58
Isabel Cafezeiro, Carmem Gadelha, Virginia Chaitin, and Ivan da Costa Marques

A Revised Lexical Approach for Analyzing Online Reviews 69
Xiaowen Fang and Fan Zhao

Ergonomics in the Practice of Project Architect on Selected Examples 77
Klaudiusz Fross

Color Saliency Research on Visual Perceptual Layering Method 86
Jing Li, Chengqi Xue, Wencheng Tang, and Xiaoli Wu

Generating Human-Computer Micro-task Workflows from Domain Ontologies 98
Nuno Luz, Nuno Silva, and Paulo Novais

Methodological Capabilities for Emergent Design 110
Carl M. Olsson and Jeanette Eriksson

Value Pie: A Culturally Informed Conceptual Scheme for Understanding Values in Design 122
Roberto Pereira and Maria Cecília Calani Baranauskas

The Formulation and Visualization of 3D Avatar Design, Including Three Basic Theoretical Elements: Aesthetic, User Experience and Psychology 134
Thomas Photiadis and Panayiotis Zaphiris

Augmentation and the Visual Mind 145
Hendrik Wahl

Scripting Interactive Art Installations in Public Spaces 157
Yu Zhang, Joep Frens, Mathias Funk, Jun Hu, and Matthias Rauterberg

Design-Neuroscience: Interactions between the Creative and Cognitive Processes of the Brain and Design 167
Rachel Zuanon

HCI and Design Education

Charting the Landscape of HCI Education in Brazil 177
Clodis Boscarioli, Milene S. Silveira, Raquel Oliveira Prates, Sílvia Amélia Bim, and Simone Diniz Junqueira Barbosa

Human-Computer Interaction Education and Diversity 187
Tom Gross

Tangible Disparity - Different Notions of the Material as Catalyst of Interdisciplinary Communication 199
Michael Heidt, Linda Pfeiffer, Andreas Bischof, and Paul Rosenthal

Improvement of Novice Software Developers' Understanding about Usability: The Role of Empathy Toward Users as a Case of Emotional Contagion 207
Fulvio Lizano and Jan Stage

Fast and Not Furious 219
Luiz Lopes Lemos Junior, Fábio Evangelista Santana, Fernando Antonio Forcellini, Luiz Fernando Vaseak Machado, and João Paulo Castilho

Teaching and Learning HCI Online 230
Enric Mor, Muriel Garreta-Domingo, Enosha Hettiarachchi, and Nuria Ferran

Comparison of Creativity Enhancement and Idea Generation Methods in Engineering Design Training 242
Barbara Motyl and Stefano Filippi

Studio-Based Learning as a Natural Fit to Teaching Human-Computer Interaction 251
Paula Alexandra Silva, Martha E. Crosby, and Blanca J. Polo

Teaching Design for All Through Empathic Modeling: A Case Study in Tallinn University 259
Vladimir Tomberg and Mart Laanpere

Models, Patterns and Tools for UI Development

HCI Prototyping and Modeling of Future Psychotherapy Technologies in Second Life 273
Sheryl Brahnam

Combining Design of Models for Smart Environments with Pattern-Based Extraction 285
Gregor Buchholz and Peter Forbrig

Evaluation of Model-Based User Interface Development Approaches 295
Jürgen Engel, Christian Herdin, and Christian Märtin

Engineering Variance: Software Techniques for Scalable, Customizable, and Reusable Multimodal Processing 308
Marc Erich Latoschik and Martin Fischbach

HCI-Patterns for Developing Mobile Apps and Digital Video-Assist-Technology for the Film Set 320
Christian Märtin, Anthony Stein, Bernhard Prell, and Andreas Kesper

IntNovate a Toolkit to Ease the Implementation of Every Interaction Paradigm on Every Device 331
Bruno Merlin

One Interface, Many Views: A Case for Repeatable Patterns 340
Weston Moran

Picture-Driven User Interface Development for Applications on Multi-platforms 350
Vinh-Tiep Nguyen, Minh-Triet Tran, and Anh-Duc Duong

PeNTa: Formal Modeling for Multi-touch Systems Using Petri Net 361
Francisco R. Ortega, Su Liu, Frank Hernandez, Armando Barreto, Naphtali Rishe, and Malek Adjouadi

An Iterative and Incremental Process for Interaction Design through Automated GUI Generation 373
David Raneburger, Roman Popp, Hermann Kaindl, Alexander Armbruster, and Vedran Šajatović

Adaptive and Personalized Interfaces

A Model and Guidelines for the Interface Design Process for Adaptive Web Applications (IDPAWA) 387
Claudia Regina Batista, Vania Ribas Ulbricht, and Adhemar Maria do Valle Filho

A Model to Promote Interaction between Humans and Data Fusion Intelligence to Enhance Situational Awareness 399
Leonardo Botega, Cláudia Berti, Regina Araújo, and Vânia Paula de Almeida Neris

Visualization Adaptation Based on Environmental Influencing Factors 411
Dirk Burkhardt, Kawa Nazemi, Jose Daniel Encarnacao, Wilhelm Retz, and Jörn Kohlhammer

Intelligent Document User Interface Design Using MVC and UIML 423
Lawrence Henschen, Ning Li, Yunmei Shi, Yuhan Zhang, and Julia Lee

Log-Based Personalization Tool as an Assistive Technology 433
Vagner Figueredo de Santana and Maria Cecília Calani Baranauskas

A Practical Solution for the Automatic Generation of User Interfaces – What Are the Benefits of a Practical Solution for the Automatic Generation of User Interfaces? 445
Miroslav Sili, Christopher Mayer, Martin Morandell, Matthias Gira, and Martin Petzold

Proposal of Collaborative Learning Support Method in Risk Communications 457
Hiroshi Yajima, Naohisa Tanabe, and Ryoich Sasaki

Evaluation Methods, Techniques and Case Studies

Towards Qualitative and Quantitative Data Integration Approach for Enhancing HCI Quality Evaluation 469
Ahlem Assila, Káthia Marçal de Oliveira, and Houcine Ezzedine

Efficiency in Performing Basic Tasks Using Word Processing Programs by the Elderly as a Measure of the Ergonomic Quality of Software 481
Krzysztof Hankiewicz and Marcin Butlewski

Guidelines for Usability Field Tests in the Dynamic Contexts of Public Transport 489
Stephan Hörold, Cindy Mayas, and Heidi Krömker

Integrating Usability Evaluations into Scrum: A Case Study Based on Remote Synchronous User Testing 500
Fulvio Lizano, Maria Marta Sandoval, and Jan Stage

Evaluating an Automatic Adaptive Delivery Method of English Words Learning Contents for University Students in Science and Technology . . . 510
Shimpei Matsumoto, Taiki Kurisu, Tomoko Kashima, and Masanori Akiyoshi

Can Users Speak for Themselves? Investigating Users Ability to Identify Their Own Interactive Breakdowns 521
Bernardo A.M. Mattos, Raquel L.S. Pereira, and Raquel Oliveira Prates

Reflections on the Cross-Platform Semiotic Inspection Method 533
Rodrigo de A. Maués and Simone Diniz Junqueira Barbosa

Evaluating Methods and Equipment for Usability Field Tests in Public Transport 545
Cindy Mayas, Stephan Hörold, Christina Rosenmöller, and Heidi Krömker

ErgoSV: An Environment to Support Usability Evaluation Using Face and Speech Recognition 554
Thiago Adriano Coleti, Marcelo Morandini, and Fátima de Lourdes dos Santos Nunes

Identifying Intention and Perception Mismatches in Digitally Augmented Museum Settings 565
Hanna-Liisa Pender and David Lamas

Heuristics for Assessing Emotional Response of Viewers during the Interaction with TV Programs 577
Kamila Rios da Hora Rodrigues, Cesar Augusto Camillo Teixeira, and Vânia Paula de Almeida Neris

Evaluation of Industrial Touch Interfaces Using a Modular Software Architecture 589
Philipp Tiefenbacher, Fabian Bumberger, and Gerhard Rigoll

Visualisation Methods and Techniques

3D Face-Aware Electronics with Low-Resolution Imaging 603
Yu-Jin Hong, Jaewon Kim, Junghyun Cho, and Ig-Jae Kim

Timeline Localization 611
Ilona Nawrot and Antoine Doucet

Design Criteria for Public Display User Interfaces 623
Alessandro Bendinelli and Fabio Paternò

Recommender System to Support Chart Constructions with Statistical Data 631
Taissa Abdalla Filgueiras de Sousa and Simone Diniz Junqueira Barbosa

Deterministic Local Layouts through High-Dimensional Layout Stitching 643
Martin Steiger, Hendrik Lücke-Tieke, Thorsten May, Arjan Kuijper, and Jörn Kohlhammer

SyncBox - Synchronizer and Interface for High-Speed Macro Photography 652
Krzysztof Szklanny, Armand Stańczak, Paweł Wojtków, Sergio Cosentino, and Alicja Wieczorkowska

Author Index 663