SPIRITUAL AMBIANCE IN INTERACTIVE TEMPLE

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Abstract. This paper introduces a new dimension of spiritual ambiance design using a real-world interactive temple design project. The research focus has shifted from users’ basic demands for physical design artifacts to the spiritual demands through embodied interaction. Thus, this study aims at enhancing the spiritual reflection in temple design through ambient media in interactive space. The objective of designing spiritual ambiance in temple is to develop a medium for taking the believers into religious contemplation and enhancing understanding of spirit of Bodhisattva Guan Yin. This research develops the design process of interactive space design with spiritual ambiance. Through the three design levels of emotional design principles, the design conceptual model of spiritual ambiance triggers resonances through metaphor association. To verify the conceptual model, the design concept is implemented in the physical space via human-centered embodied interaction. The on-site project not only introduces advanced sensing technology embedded into the temple but also verifies the applicability of human–computer interaction to a new dimension of spiritual ambiance design.

Keywords. Human–computer interaction; ubiquitous computing; interactive space; spiritual ambiance.

1. Introduction

It’s necessary to reconsider the integration of information technology and architecture due to the change of types and functions in human-being’s living
space as the interaction space design popular trend. In recent years, interactive space design has been providing rich digital experience environment for majority people. That means users can experience similar virtual ambiance as physical spaces. Contemporary design trend will not only focus on diversified functional spaces providing, but on human beings’ spiritual change. Embodied technology applications for interactive interface are sprung up.

Architects, interior designers, and information technicians have long been working on how to integrate digital technology with the physical environment. This new wave of computer progress provides a reconsideration of the contexture of space. The contexture of space must not only encompass building materials, electronics, and mechanics, but also the consideration of interface forms, user behaviour, environmental psychology and its spatial atmosphere. Moreover, the focus of design research has shifted from physical design to emotional design; likewise, the design focus of interactive space shifts from interaction interface design to experience design, i.e., ambiance design at reflective level. To embody spiritual ambiance in a religious space is not only enhancing the spiritual atmosphere in the temple, but it is also a way to design space at reflective level.

Researchers have worked on various aspects of the integration of information technology and the physical environment. Ubiquitous computing (Weiser, 2002) indicates the third wave in computing where invisible computing technology will be embedded in everyday objects. Works in the sensing-based environment (Culler and Mulder, 2004) try to increase the mobility of information. Sensing-based interactive space takes human behaviour into account, and enables designer to establish an intuitive interactive space. Slow technology (Hallnas and Redstrom, 2001) is concerned about the design agendas for technology aimed at reflection and moments of mental rest rather than efficiency in performance. Their projects, Sound Mirrors and The Chatter Box (Hallnas and Redstrom, 2003), try to let users clearly recognise the hidden significance behind design content. Another related work “The Intelligent Garden” by I.A.Lab (Jeng, 2008) uses virtual images for the reflection of interpersonal relationship.

As part of the environment, information technology is used not only for efficiency but also to enhance the atmosphere of the physical environment through embodied interaction. This research tries to develop the design process of interactive space with spiritual atmosphere for designing users’ experience of spiritual reflection. The design process is carried out in a real-world temple to enhance the religious atmosphere in the space for taking the believers into religious contemplation and triggering their resonances of emotional reflection. A Taoist temple, Hu-Ann temple locates at the Lotus Pond in the
east of Zuo-Ying’s old community and north of the Kaohsiung City is chosen to implement the study. The interactive setting will be set in the Altar of Guan-Yin of the second floor of the temple. Figure 1 shows the physical conditions of the study site.

**Figure 1. The study site is at the passageway of the second floor in Hu-Ann Temple.**

### 2. The concept of spiritual ambiance design

In the book of *Emotional design: why we love (or hate) everyday things*, Donald Norman (Norman, 2005) presents his concept that most objects are perceived on all three levels (dimensions): visceral, behavioral and reflective level. He believes that the objects should be aesthetic and have an emotional impact as well. Regarding a successful product design at reflective level, the designer crosses the gap between users and oneself by “system image” of the conceptual model and expresses the information by physical product. At this rate, for religious space design, the designer’s idea may be expressed by messages in spiritual content; likewise, the users enter the ambiance space and understand the thoughts of the designer by spiritual reflection. The diversity of the emotional design and the spiritual ambiance design is that the latter expresses information by abstract religious implication. Therefore, the spiritual ambiance requires more refined process to transform abstract ideas to concrete images as allows users to realise the abstract idea through the ambiance.

The difficulty of abstract idea expression is the deficiency of stimuli to trigger emotions. Such stimuli are touchable, visible, audible or perceivable by nose. The adequate stimuli found by the designer may communicate with the users without fail. The precedent related works indicate that interactive design with ambiance-space theme is able to employ metaphors to trigger human inner emotions. For instance, the project of The Intelligent Garden uses the image of butterflies as the metaphor of the wonderful of interpersonal interaction. Thus, the spiritual ambiance design should pertain to the like of the emotional design.
The metaphor finding is a process of symbols selection and association. The perspectives of affective design (Webpage without author info, 2008) identify that internal feelings generated without external stimuli can be triggered by association to past experience or through deliberation and appraisal. Therein, “association” may help designer find the metaphors as stimuli. In the temple, it is easy to see various Buddhist images, symbols or totems on the wall decoration. With the religious knowledge and cultural experience, people may associate those symbols of decorations to spiritual metaphors without difficulty. For example, in the knowledge of Buddhist culture, symbol of lotus presents much meaning such as reminding temple-goers of the purity of spirituality, inherently pure potential of the mind, religious contemplation or the practice of generosity and opening the heart. The symbol of lions means safety and security; light means stability and peaceful world; dharma wheel presents the historical process of teaching the Buddhadharma; water or dew means to clean our mind.

In order to better deliver the messages to the users, a spiritual scenario with spiritual content would help people to recognise the metaphors easily. Therefore, it would be better to use a folklore story or religious allusion as reference while making symbols selection. The following model of spiritual ambiance design expresses the development of the design concept. The selected religious symbols form a meaningful spiritual content and link the physical and virtual spaces through metaphor association. The spiritual content is transformed to spiritual scenario to enhance the spiritual ambiance in the physical space through embodied interaction. To verify the conceptual model, a real-world example is implemented in the physical space via human-centered embodied interaction.

![Figure 2. The conceptual model of spiritual ambiance design. The user is able to experience the virtual ambiance through metaphors association while he/she moves in the physical world.](Image)
3. A real-world example

The site of the project is a part of the space remodel project in the second floor of the temple. The design process is carried out by a professional team comprised of interior designers, information communication technology engineers, and interactive graphics designers. The interior designer wants to design a transit space linking the ground floor where the Taoist rituals are held and the second floor where people come for complementation and learning. In this project, a proper transit space should be able to make people be quiet before they start to learn Buddhism. The hypothesis for the issue of embodying spiritual ambiance in the religious space is:

Hypothesis: Can the spiritual ambiance be improved through embodied interaction?

3.1. OVERLAYING THE VIRTUAL LAYOUT ON PHYSICAL LAYOUT

Space layout is one of the most critical issues in professional architecture and interior design since smooth mobility render the possible development of space and let users act cosily. Thus, overlaying the virtual layout on the physical space is the problem to be solved first in the interactive space implementation. By space analysis, the physical space is divided into three space units as the front (elevator to overpass), mid (overpass) and rear (overpass to entrance) sections. If the layout of virtual space and the physical space are overlaid, the virtual space shall be altered to be three space units which is a linear space (see figure 3). Likewise, as for the transformation of virtual space, it is more realistic for this case to transform the activity in the space to the idea of walking through a river.

![Figure 3. Space analysis helps the match of virtual and physical layout. The physical space is transformed to virtual riverbanks in this project.](image-url)
3.2. SYMBOLS SELECTION AND METAPHORS ASSOCIATION

In this project, the story of Water-spraying Guan Yin is used as reference to help select the symbols for metaphors association. One day in Sung Dynasty, Bodhisattva Guan Yin held a pure bottle of willows and spayed dew in the pure bottle to the sky for thousand and thousand times to salve the pitiful souls of thousands killed civilians in warfare by Her power. In the story, willows, dews, water reflection seem to represent mental mercies in believers’ minds. To make a scenario for the spiritual ambiance, the symbol of dew is selected; meanwhile, a lotus pond and the portrait of Bodhisattva Guan Yin able to let users sense the Bodhisattva’s spirits are selected as elements of the scenario. Ideally, dews represent mental purification, lotuses represent Nirvana and the portrait of Guan Yin represents the obtainment of way. Afterwards, the three independent elements are series connected in accordance with the rational sequence to make images and form the scenario:

![Figure 5. Symbols selection and the metaphors association. The dews creating ripples represent mental purification, lotuses represent Nirvana and the portrait of Guan Yin represents the obtainment of way.](image)

In the process of completing the spiritual ambiance content, the onsite-space realisation renders the close integrity of content and space as if an architect designed the architectural structure in terms of mountain terrains to enable the house to integrate with terrain landscape. The scenario formed with three independent images is the soul of ambiance containing the meaning of spiritual ambiance as well as the language used by the designer to communicate with the users. To enable users interact intuitively with the embodied ambiance, the designer should arrange users’ action and movements with coordinate images carefully under the conditions of physical environment.

3.3. TRIGGERS SETTING AND INTERFACE DESIGN

The ambiance content renders the start of designing the device. Upon the advices of the technical team, it is an optimal option to build an environment with automated sensing devices. There are some possible problems in this
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phase: 1. How to enable the clerks managing the temple with no computer-related basic knowledge to operate the device? 2. How to fix and hide the sensing device in a safe place? As for technique, we use multimedia player to broadcast images, and a microprocessor to receive the signals transmitted by the sensor for executing the set programs. The first and second images controlled by the capacitive sensor and infrared-rays sensor respectively are presented above the overpass through projecting. Another infrared-rays sensor is at the end of the overpass for lighting up the portrait of Bodhisattva Guan-Yin. After the detection model is confirmed, the plot of the entire interactive design is as follows. An image of pond is projected onto the glass of the overpass with lotuses not yet blooming; user stands in front of the lotus pond and put the hand on a 3D handprint mold above a capacitive sensor. At this time, the sound of water dripping and the ripples on the pond are presented. User moves forward and walks onto the virtual pond when lotuses bloom one by one. After passing by the lotus pond, user raises head and sees Bodhisattva in front of him/her. The positions of sensors and correspondent images are indicated in the following figures.

As for the concern of interior and interface design may affect the experience, we design a 3D handprint mold to imply that user can put hand to let sensor detect since it is our expectation to trigger user’s curiosity for touching the interactive interface thoughtlessly. The design of the interface is the trigger of the entire interactive device, the first contact point for user to touch.

Figure 6. The user’s behaviours and corresponding images. User touches the interface in front of the overpass to get dew ideally dripping on the virtual calm lotus pond, and generates ripples. Then user walks through the virtual pond with blooming lotuses. After pass the virtual lotus pond, sensor turns the light on and user raises head for seeing Guan Yin.
the interactive device, which is quite important. In the Buddhist spirits, the handprint of Buddhist symbolises the special mind power and karma. The so-called handprint ties are to realise the mind power and mercy of Buddhist by their actions and behaviours as to expect oneself to generate the merciful mind power and strive for it through the enforcement in daily life routines to benefit the surroundings by affections. Based on the preceding spiritual background, the project of the embodied interaction is named “Mental Touch with Buddhist” which delivers such a design concept.

4. Evaluation

The design process is carried out by a professional team comprised of interior designers, information communication technology engineers, and interactive graphics designers. Integrating multiple disciplines in the temple design project is a challenging work. Besides the difficulties in integrating software and hardware technologies in the temple space operation, gaining the trust and emotions of users are also a challenge. That is, the study must overlay the virtual on a physical setting seamlessly and design the experience in accordance with the daily routines to let users activate interactive software programs intuitively.

To evaluate the usefulness of interactive temple, some believers of the temple are invited to help the usability test and express their feelings about the interactive space. Based on our observations and interviews, most the users show their interests in interactive design in the temple and feel affective with the spiritual ambiance at different degrees. Although users share their understanding about the metaphors, future research is required in the evaluation of users’ cognitions.

4.1. RECORD OF TECHNICAL PROBLEMS

In addition to the design concept, there are problems arising from the practical operation worthwhile the references to the future relevant design since this study conducts the research in the daily living space, especially the technical issues involving concerns of plural aspects and levels. Moreover, this study records the technical problems from the test period to the formal use period in one year, and expects to provide the reasons and backgrounds via a sequential lineup as the following figure.

Most technical problems happened in six weeks after the installation was finished. Although there is no big problem discovered in the test term, there are unpredictable conditions after use. One of the manual mistakes is related to operator training, and it happens again when a new staff member is distributed
to in charge with the operation. People tend to click the wrong button instead of the “Open” button. The recording data and conditions are useful for developing future architectural design projects in affective dimension.

5. Developing guidelines for spiritual ambiance in interactive space

One of the basic ideas behind the examples of spiritual ambiance is to use digital information in material in integration with physical and virtual spaces. Taking the interactive temple as an example, the purpose is not to create and exciting visual presentation. The main purpose is to present the material submitted to the temple in a special way. This makes the temple less impressive from a typical decorated point of view. This is a space for spiritual reflection and contemplation. Giving the experience presented here, we propose two basic guidelines for spiritual ambiance in interactive space:

- Focus on the content of spiritual ambiance – the source of ambient elements must relate to users’ background or cultural experience so that the elements may become the triggers to lure association; and
- Focus on the spatial integration – the space layout overlaying and interface design will impact the space atmosphere. Intuitive action and movements design help users to involve in the spiritual ambiance.

6. Suggestion for future studies

This study engaged the spatial construction in real world and the participation of actual users in the research. According to the results of the project and the feedbacks from users, the objective improvements are proposed as the references to the future studies. (1) Spatial context: In this study, users used to use the device collectively after the group activity, overloading the original once-a-person design. The negligent spatial use contents affect the usability of the interactive device. The future design shall include the consideration of actual use situation and related data in advance to prevent the gap between the

Figure 7. Technical problem and time response table. This study records the technical problems from the test period to the formal use period in one year (9/2007 to 9/2008).
design and actual use. (II) Spatial management context: In this study, the reoccurrences of clicking the wrong buttons resulted from the change of managers affect the working sometimes. This manual fault led to the severe maintenance problems, and shows the importance of operation education. It is better to have a long-term assistance for future work in order to reduce the operated mistake. (III) Cost: In this project, the main expenditures are the construction fees of interactive design software and hardware and spatial reparation cost. Since the education training and continuous maintenance charge are excluded in this project, the long-term complete service is unavailable. Still, it is necessary to designate technical assistants regularly for the participation in the use activity and helping the main users realise further the contents of the interactive design in the beginning year.

In this study, we find that the spiritual ambiance in interactive space plays as the medium of innovation in architecture, which actualised the spiritual world in physical world. Moreover, the design practice provides the HCI researchers with the references of design and execution in the future interactive space and the innovative design process models for inter-industrial and interdisciplinary collaborative experiences.

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References


