個人簡歷

作者李哲維，現為國立交通大學建築研究所碩士班學生，2008 年畢業於國立臺南大學數位學習科技學系，並於同年進入交大建築所數位組就讀。研究方向著重於互動式呈現媒材於建築設計的應用，對於人與空間等互動議題亦感興趣，曾參與交大 Eco-City 時光樂活城（2008）、智慧型環境適應性個人移動載具之創新設計（2009）等計畫案，國際學術著作如下：

Zhe-Wei Lee.: 2010, Facilitating communication between architects and owners by new Interface, CAADRIA 2010, HongKong.

(參見附錄 A)

Zhe-Wei Lee.: 2010, A new communication method between human and space, Create10 Interaction Design Conference, Edinburgh, UK.

(參見附錄 B)

附件 A

FACILITATING COMMUNICATION BETWEEN ARCHITECTS AND OWNERS BY NEW INTERFACE

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1. Introduction

For architects, representing media is regarded not only a tool concerning design, communication, and concept connection (Schön, 1983) but a review instrument between architects, owners and constructors as well before architecture projects are put into action (Liu, 2007). In addition, such a method also offers a much easier and direct way for owners to smooth conversation with people lacking design experience (Wu, 2003).

Given the diverse nature of digital technology, digital model has played an essential role when it comes to bridging consensus between architects and owners (Ben and Catherine, 2004). Nevertheless, despite enjoying leading role, digital media still lacks the senses of touch, space and scale that traditional media possesses. In addition, poor communication might occur during the presentation process as well (Lee, 2008). Though animation is able to create the 'being inside' status, the fixed points still have confined the owners to access the design freely.

Having observed from the cases, several questions have been raised regarding how to redefine the relationship between architect and owner, as well as how to clear out the confusion occurred through the design layout presentation at the same time.

2. Methodology and Steps

The purpose of this research seeks to explore the depth of the issue by examining the five ongoing design projects through employing four steps below.

1. Interview/observation: observe the communications between architect and owner by conducting separate interviews regarding the selection of media to be presented and the frequency of the design project to be revised.
2. Factor analysis: the method seeks to identify a factor that affects the process of representing media between architect and owner.
3. System implementation: following assessing viability of factor analysis, this step aims to offset the misperception brought by the poor mutual communication via presenting media in the digital form. In addition, the strength of presenting media in the traditional form such as presenting the reality of the design, would also be introduced at the same time.

4. System test: following completing the assessment, a test model will be established and be offered to the architects and the owners involved in the ongoing projects. Several interviews, along with model test will be re-examined and assessed after the report on the feedback for the test model is received.

3. Conclusion

Through the making of "digital material sample board", combined with the features of instantaneity, free viewpoint and touch, the space of 'being inside' interface would therefore be created. From this perspective, communication on representing media should not be seen as visual observation, but should be regarded as space simulation for the purpose of further assessment before the projects are turned into reality. In foreseeable future, we believe there is no need for the architects to waste their time on attending meeting to carry out their presentation assignment. Instead, the simultaneous interaction effect brought by the micro-projection techniques via mobile phones or three-dimension televisions will contribute to increasing the not only efficiency but also cost reduction on the process of architecture design.

Figure 1. 3D model construction.

Figure 2. Digital material sample board.

References

Ben, S. and Catherine, P.: 2004, *Designing The User Interface: Strategies For Effective Human-computer Interaction*, Pearson Education, USA

Lee, C. Y.: 2008, *Digital Presentation Space: a Tangible Framework in VR CAVE*, Hsinchu, Taiwan

Liu, Y. T.: 2007, *Digital Architecture and Eastern Experiment*, Commonwealth Publishing, Taipei

Schön, D.: 1983, *The reflective practitoner*, Basic Books, New York

Wu, Y. L.: 2003, *A Digital Modeling Environment Creating Physical Characteristics*, CAADRIA'03, Thailand, pp. 385-391

A NEW COMMUNICATION METHOD BETWEEN HUMAN AND SPACE

An example of motorcycle warning system

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1. Introduction

Visual is considered the most frequently-used senses for human beings, followed by hearing. However, there is a strong likelihood that body sense is rarely being utilized. Out of all the sensors, touch is a perception resulting from activation of neural receptors and is regarded the most directly stimulated sensor. That is to say, body sense plays a key role in responding various pressures when vision or hearing fails to respond. For instance, the mobile phone's vibrate mode device is designed for those who suffer from hearing loss or need this function under certain circumstances.

2. Problem statement

According to statistics released by National Police Agency under the Ministry of the Interior, driver negligence auto accident is ranked first among all the traffic accidents. Moreover, neglecting checking the traffic condition in front of the vehicles is considered the leading cause for such accidents. Thus, quite a few research and development regarding sensory feedback device has been embarked on, particularly the research on the steering wheel and accelerator devices. On the contrary, the motorcycle safety has received less attention. Considering motorcycle's less information and less safe option, motorcyclists are at higher risk of injury or death compared to motor drivers. How to effectively inform the motorcyclists safety concern to prevent from traffic accidents should not be overlooked.

3. Previous work

For motorcyclists, they obtain information via visual sense while controlling their vehicles (Rockwell 1972). However, they tend to neglect unexpected traffic situations when their vision remains concentrated on certain aspects (J.K. O'Regan 1999). It would be a heavy load on motorcyclists if their visual sensors are distracted from those irrelevant to riding situation. In addition, it seems that auditory warning device is inappropriate for motorcyclists as they tend to expose themselves to noisy environment. Thus, in order to reinforce trust between drivers and warning device, it is better to employ touch sensor as warning device for drivers (John D. Lee 2004).

3. Methodology

The research seeks to deal with the issue of the motorcycle riding safety through the approach of employing human sense system as an information receiver during motorcycle riding. A great deal of researches related to issue has been conducted and several tangible results have been produced.

Based on the previous surveys, we place a simple-designed ultrasonic touch sensor on a bicycle, with its range from 50 to 300 centimeters. The feedback signal of three vibrational bands observed with frequency intervals can be transmitted by the circuit board and the interface of transmission is a scarf covered with micro vibration motor [fig.1]. The design seeks to pass the information behind the motorcyclists via vibration frequency transmitted to the sensor. When the distance between motorcycle and succeeding vehicles shortens, different frequency bands would be transmitted by the sensor in order to reduce the burden on the motorcyclists for visual checks in their field of view.

4. Conclusion

Following completing the system [fig.2], an experiment on those who have at least three years of experience riding motorcycles, was conducted [fig.3]. The test aims to see to what extent the feedback from the touch sensor can effectively lessens the visual and mental burden as well.

Out of all the sensors, touch is a perception resulting from activation of neural receptors and is regarded the most directly stimulated sensor. That is to say, body sense plays a key role in responding various

pressures when vision or hearing fails to respond. As far as we are concerned, we are not attempting to create a viable lane collision warning system as this field belongs to communication and traffic experts. Instead, we seek to create new approach in terms of how to employ human touch sense as an interface between human and environment. And we hope that the new addition of touch sense as an interface can offer more potentials for media materials.

Figure.1

Figure.2

Figure.3

References

J.K. O'Regan : 1999, Change Blindness as a Result of 'Mud splashes', Nature, 398: 34.

John D. Lee : 2004, Collision Warning Design to Mitigate Driver Distraction, CHI 2004 pp. 24-29 April, Vienna, Austria.

Rockwell. RE : 1972, An investigation of the relationship of nine nointervention variables to the school success or failure of culturally disadvantaged children, Dissertation Abstracts International, 33, 2793

David A. Abbink, Neuromuscular Analysis of Haptic Feedback during Car Following, 2002

Evans, L. (1991). Traffic Safety and the Driver. Van Nostrand Reinhold, New York.

Godthelp, J., and J. Schumann (1993). Intelligent Accelerator: an Element of Driver Support. In: Driving future vehicles. Taylor & Francis, London.

Lee, J.D. and See, K.A. Trust in technology: Designing for appropriate reliance. Human Factors.

Steve J. Summerskill, J. Mark Porter and Gary E. Burnett, Feeling your way home: The use of haptic interfaces within cars to make safety pleasurable. 3rd International conference on 'Design and Emotion'. 2004.