

Aesthetic Intelligence – Concepts, Technologies and Applications

Kai Kasugai¹, Carsten Röcker¹, Daniela Plewe²,
Takashi Kiriya³, Virpi Oksman⁴

¹RWTH Aachen University, Germany, {kasugai, roecker}@humtec.rwth-aachen.de

²National University of Singapore, danielaplewe@nus.edu.sg

³Tokyo University of the Arts, Japan, kiriyama@gsfnm.jp

⁴VTT Tech. Res. Centre of Finland, oksmanvirpi@gmail.com

Abstract. This paper reports on the ideas and results of the First International Workshop on Aesthetic Intelligence (AxI'11) held as a satellite workshop during the International Joint Conference on Ambient Intelligence (AmI'11).

Keywords: Ambient Intelligence, Aesthetics, Design, Architecture.

1 Introduction

The *First International Workshop on Aesthetic Intelligence* (AxI'11) was jointly organized by RWTH Aachen University (Germany), the National University of Singapore, the University of Tokyo (Japan), and the Technical University of Sydney (Australia). On previous visits to the AmI conference, we noticed that, while the concept and idea of ambient intelligence was already well established, one question that was often left open was how 'ambient' technology should actually look like, how it should appear, and whether it should appear at all. Thus, we asked participants to report on aesthetic qualities of ambient intelligence and the meaning of aesthetics in ambient intelligence projects. For a start, we referred to this topic as 'aesthetic intelligence'. In this first workshop, we had contributions from various domains and jointly explored the relevance of aesthetics for these fields.

In the following section, we will present selected workshop talks focusing on concepts, technologies and applications of aesthetic intelligence.

2 Concepts, Technologies and Applications of Aesthetic Intelligence

Addressing conceptual aspects of Aesthetic Intelligence, Plewe [2] introduced the idea of *strategic media* referring to media applications, which support activities related to the design and implementation of strategies in business or personal contexts. Under strategic activities the author subsumes the sequence of actions from defining goals/intentions, the collection of relevant information, a planning phase, leading to decision making and the implantation of the strategy followed by some sort

of a feedback channel to ensure long term effects. Inspired by so called strategic dash boards and trading platforms for the business context it is asked, what could be useful design heuristics supporting such strategic media applications in general. Three conceptual prototypes developed by the author illustrated the concepts.

User-centered design approaches are an important step towards the wider acceptance of Ambient Intelligence applications. Oksman presented their key findings from two user studies exploring the perception of an ambient home design application concept, which combined features of social media, augmented reality and 3D modeling. The talk summarized the results from a scenario-based survey with N=241 respondents on ambient home design applications and two co-design focus groups, which were composed of bloggers in the field of interior design.

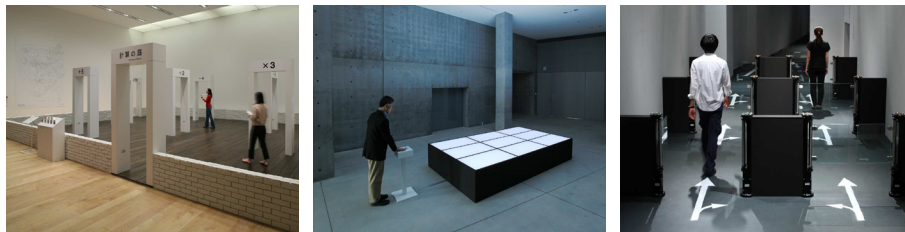


Figure 2: Arithmetik Garden, Pool of Fingerprints and The Nominal Divide

Focusing more on the application side, Kiriya and Sato [1] presented three museum exhibits they created in the last five years (see Figure 2). In the first exhibit, *Arithmetik Garden*, the visitor tries to make an initial number equal to 73 by going through arithmetic gates. The visitor is tracked using RFID sensors in the gates. By analyzing data of over 71,000 visitors, they found some patterns of human behavior. In the second exhibit, *Pool of Fingerprints*, a number of fingerprints are swimming in a large horizontal display. When the visitor scans his/her fingerprint, it starts to swim in the display. When the visitor scans the same finger for the second time, the fingerprint released earlier comes back. People feel emotional attachment to their fingerprints for the first time when they see their fingerprints swim back to them. Animating separation and reunion with fingerprint causes this emotion. The third exhibit, *The Nominal Divide*, uses face recognition system to divide the visitor between male and female, under 29 and over 30, and smiling and blank. People feel as if being accepted by someone when the gate in front of them opens. Space is carefully designed in all three exhibits, because the existence of other visitors around the exhibit is essential to extend the visitor's experience.

Further application examples illustrating the potential of Aesthetic Intelligence in domestic spaces were presented by Kasugai and Röcker [3]. The talk included different prototypes of interactive architecture for increased quality of life in home environments: *MyGreenSpace*, *MeetingMyEating* and *UbiGUI* (see Figure 3).



Figure 3: myGreenSpace, MeetingMeEating and the UbiGui Interface

MyGreenSpace is an interactive three-dimensional wallpaper, which virtually extends physical spaces by using large-scale displays to render nature scenes that automatically adjust their perspective to the position of the viewer. In the presented example, a forest scene is shown on an entire wall of the living room and, by tracking the head position of the user, the perspective of the forest adjusts according to the view of the user. Linking head position and displayed image content creates an immediate, yet indirect way of interaction between a user and the ambient display. *MeetingMeEating* allows two persons at separate locations to dine together. The presented system combines video conferencing technology and the concept of a virtual room extension illustrated in the previous example. This time, two users at different locations sit on tables that are placed in front of large-scale display units, which show the video streams of the remote dining partner and a part of the partner's table. In the final part of the talk, the authors presented *UbiGUI*, a graphical user interface, specifically designed for large, interactive displays.

Conclusion

The talks held at the workshop included reports on an electronic healthcare environment, fashionable skins for mobile phones, business strategies and negotiation visualizations, e-commerce and design applications for furniture, as well as interactive art installations illustrating abstract concepts like mathematical operations. We found the examples very inspiring and see high potential in understanding aesthetic principles of ambient intelligence technology in relation to the functionality, usability and acceptance of these systems.

References

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