

This is a list of selected HCI-related projects that I completed during the User-System Interaction (USI) program at Eindhoven University of Technology, the Netherlands. The projects are grouped according to domains.

## Lifestyle and Leisure

### DreamScreen: User Study for the Intelligent Shop Window

*9-month industrial project at Media Interaction group, Philips Research Eindhoven*

As the final requirement to obtain the PDEng degree, I did an industrial project for 9 months at Media Interaction Group, Philips Research Eindhoven. The goal of this project was to study whether scenarios are a good tool for predicting the end-user attitude towards an interactive system. Non-systematic observations during the course of several projects at Philips Research indicated a gap between results of scenario evaluations and results of a working prototype. There was also no study yet conducted that would evaluate how well the end-user attitude towards a scenario reflects the end-user attitude towards a physical interactive system.

The carrier application for this project is the Intelligent Shop Window (ISW), located in the ShopLab at Philips High Tech Campus. Prior to this study, a scenario study was conducted to evaluate the ISW as a new application concept. My task was to conduct an evaluation of the ISW using a real working demonstrator and to compare the results of the evaluation with the results of the scenario study to investigate whether there was any relationship between the results. The evaluation was conducted in an experiment involving 40 Dutch-speaking end-users. The experiment was designed carefully to match the conditions from the scenario study. As a part of the experiment, I also implemented the user interface for the ISW using Macromedia Flash and ActionScript. After the experiment, I conducted the result comparison using SPSS.

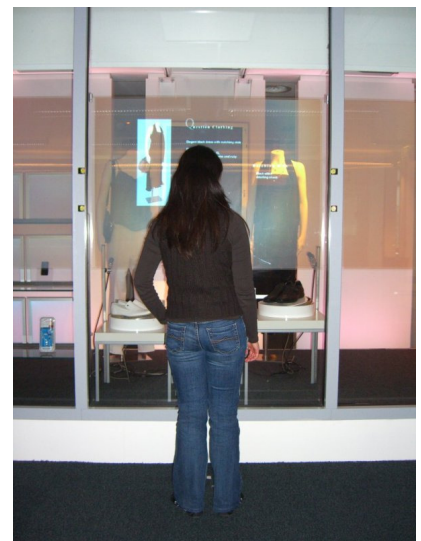
The comparison showed that scenario evaluations gave a good reflection of the demonstrator evaluation in both contexts and as such can be considered to be a good tool to get an estimate of the end-user attitude.

*USI final report (publicly available via the TU/e library):*

#### **Evaluating Scenarios as a Method to Estimate the End-User Attitude Towards an Interactive System**

*Serena Melanie Magdalena Suprawoto*

ISBN: 978-90-444-0748-8



## Enhanced Shopping Experience: Virtual Mannequin

*10-week design project for the USI module Design Case*

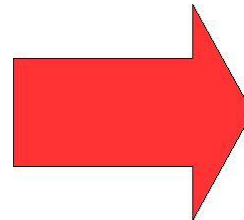
Before the start of the individual industrial project for the USI program, we were required to complete a 10-week design project. I formed a team with 2 others for this project. Our common interest led us to the shopping domain. As the first step, we conducted a study using an online questionnaire to find out irritations that commonly occur during shopping trips. Using the 111 valid responses that we obtained, we analyzed most of the underlying factors and derived the user requirements. We developed 3 concepts afterwards based on these requirements.

We showed these concepts to a contact from the industry for evaluation. Having received feedback on these concepts, we elaborated further to produce a single concept. The main part of this concept is a Virtual Mannequin in form of a 3D representation of the user. The goal of this concept is to complement the physical trying-on of clothing items, which is often a major source of irritation during shopping. We evaluated the concept using a focus group, and it was received very positively. Due to technology limitations, we managed only to build a Wizard-of-Oz unpersonalized prototype, which we tested with 9 participants. Our results indicated that the accuracy of the 3D model is the key to the believability of such a system.

*Resulting publication:*

### Enhanced Shopping Experience: A Persuasive Experience for Fashion Shoppers

*Jieyin Cheng, Serena M. Magdalena, Roel Vossen, Dzmitry Aliakseyeu*  
Poster session, 2nd International Conference on Persuasive Technology (Persuasive 2007), Palo Alto, CA, April 26-27, 2007

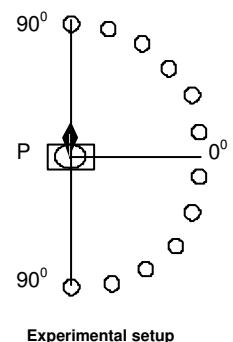
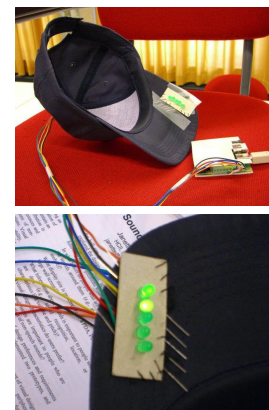


## Healthcare and the Disabled

### Hearing Things Differently

*2-week design project for the USI course Multimodal Perception*

This design project aimed for an alternative way to make people with hearing impairment aware of environmental sounds that occur around them. Sounds such as a braking car or a siren can indicate imminent danger. However, these sounds are not always accompanied by a visual cue. I, together with 3 other team mates, proposed a design solution by using light stimuli as an alert signal. These light stimuli can be mounted in the frame of glasses or under a cap. We realized a prototype for the signalling part. An array of 5 LEDs was used as the light source. The animation of the LEDs indicated the angle from which the sound originated. Our test showed that participants were able to estimate the angle of 'a coming sound' from the animation of the LEDs.



## Physiotherapy using Tangible Interfaces

1-week design project for the USI course *Tangible Interfaces*

The design task for the Tangible Interfaces course was to make a concept of an application using tangible interfaces. I and 3 other team members opted to use tangible interfaces to augment physiotherapy for patients recovering from stroke. The physiotherapy sessions are often boring and unrewarding, leaving patients unmotivated. Our objective here was to provide a more playful way to do exercises, so that patients could have more fun and be more motivated during physiotherapy sessions. The use of tangible interfaces here was based on the fact that patients have to manipulate physical objects during their exercise. When a patient handles the tangible interface, the system displays entertaining animations according to the actions of the patient. The tangible interface can also objectively measure the progress of the patient in terms of strength, speed, movement, accuracy, etc. At the end, we realized a video prototype for this concept.



## DiaBeTEENS: Designing Medical Information Website for Teenagers with Diabetes

2-week design project for the USI course *Social User Interface Design*

With 3 other team members, I was given a task to (re)design a medical information website for teenagers. Our choice fell on a website about diabetes, since this condition requires drastic lifestyle changes and constant monitoring. We started with an in-depth interview with a paramedic specialized in treating diabetic teenagers and children, to obtain our user requirements. Afterwards, we iteratively designed the look-and-feel of the website using Microsoft PowerPoint and tested our final iteration with 4 diabetic teenagers.



Resulting publication:

### Analyzing User Preferences Regarding Health-Monitoring Services for Teenagers and Young Adults with Insulin-Dependent Diabetes

Jieyin Cheng, Serena M. Magdalena, Pavan Dadlani, Pinar Erik Paker, Maurits Kaptein, Ying Li, Panos Markopoulos

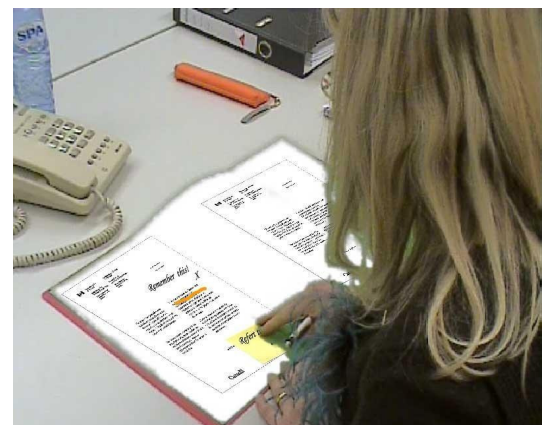
Poster session, 5th International Conference on Smart Homes and Health Telematics (ICOST 2007), Nara, Japan, June 21-23, 2007

## Office

### Electronic Paper Emulator

2-week design project for the USI course *Introduction to User Centered Design*

This was one of the first courses given at USI. I and 3 other team members chose to design a system that helps professionals organize their paper documents better and reduce their paper consumption. First, we conducted interviews with 6 professionals. Their common remark was that they still prefer to handle paper documents instead of electronic ones. We can conclude from the interviews that the system should allow personalized organization, be portable and be intuitively like paper. Next, we developed a concept that used folder metaphor. We also incorporated natural gestures and operations in handling paper documents as interaction methods, such as flipping pages, adding (post-it) notes, etc. We realized a video prototype of this concept and tested it with the same participants we interviewed for our user requirements. The concept was liked by all our participants, especially how similar it was to how they already used paper.

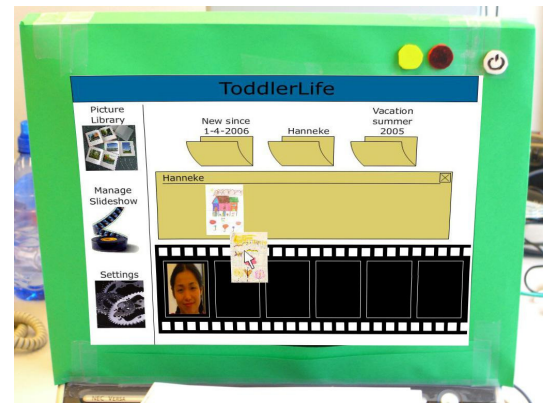


## Parents and Children

### ToddlerLife

*3-week design project for USI courses Video Interviews and Prototyping and Qualitative Research for User Requirements Acquisition*

For this project, I and 2 other team members chose to design a system to help working parents feel better connected with their young children at the daycare center. Working parents with children in a daycare center often miss special moments from their children's life. To obtain user requirements, we interviewed a working parent and a daycare center supervisor. From the results, we developed a system concept called ToddlerLife. ToddlerLife has three components: ToddlerView (an interactive photo frame for parents to view photos and drawings sent by their child); ToddlerLife PhotoMaker (for children to make photos and send them to parents); and ToddlerLife DrawingPad (to make and send drawings). We evaluated this concept by showing a video prototype during a focus group to 6 working parents. The ToddlerView and the PhotoMaker was rated with mixed results. However, the DrawingPad was received very well. It was seen as a useful educational tool for children to interact with technology. The interaction with the DrawingPad was also perceived as quite natural and intuitive.



## Usability Evaluations

### Usability Evaluation of InfoTec Photocopy Machine

*2-week project for the USI course Observation Studies and Non-Verbal User Behavior*

In this project, I conducted a usability evaluation of the user interface of a photocopy machine with 3 other team members. After exploring the interface for heuristic (expert) evaluation, the real evaluation was done by using co-discovery method with 5 pairs of participants familiar with each other. Each pair of participants were given 5 copying tasks (increasing in order of difficulty) and asked them to solve the tasks together. Besides recording the task completion time and the operations made by participants, we also recorded the facial expressions of participants. We analyzed the facial expressions for non-verbal cues associated with usability problems, together with other data. Based on our analysis, we identified numerous usability problems and gave recommendations to improve the interface.



### Usability Evaluation of Automatic Photo Ordering Machine at HEMA

*1-week project for the USI course Human Factors in Industrial Practice*

For this project, I and 3 other team members conducted a usability evaluation of the automatic photo ordering machine at HEMA in the city center of Eindhoven. We first explored the user interface, then conducted task analysis and heuristic (expert) evaluation. Afterwards, we observed 16 customers while they were using the system to order prints. During the observations, we recorded problems that arose. After customers were finished, we asked several background questions regarding their age, computer skills and experience with using the system. Combined with the result of our own heuristic evaluation, we found several usability problems. We gave several design recommendations for improvements based on our findings.

