HCI & UX Portfolio

Human-Computer Interaction and User eXperience Portfolio

Leonard Hoon, 2016

About Me

Hi, I'm Leonard Hoon. I come from a Software Engineering background and have recently submitted my PhD thesis. During the course of my studies, I taught several units at Swinburne University of Technology ranging from Algorithmic Problem Solving to Usability. You might encounter me on the bass or guitars on lazy weekend afternoons at small cafes.

I enjoy challenges, evidenced by taking on the challenge of a PhD. This also conveys my commitment to learning and knowledge sharing.

Speaking of knowledge sharing, I pride myself on my communication skills. I believe that it is critical to be able to effectively communicate.

This communication is especially critical in groups. I enjoy collaborating and learning. Plus, we get to brainstorm!

This document showcases some of my recent efforts not bound by NDA.

Thank you for your time.

PS: The icons are from font-awesome and the photo was taken by Andrew Vouliotis.

The Dementia-Friendly Home

A tablet app released by Alzheimer's Australia, developed by the Deakin Software and Technology Innovation Laboratory (DSTIL). This app can be obtained from: iTunes or Google Play.

Figure 1: Splash page of the Dementia-Friendly Home app.

Objective

The app was designed to educate carers of people living with dementia about Alzheimer's Australia's Dementia-Enabling Environment Principles (DEEP)[1]. DEEP is a series of physical design principles developed to maximise enablement and wellbeing for people living with dementia.

The goal of this app is to visually demonstrate the effect of applying the DEEP principles within a virtual home. To support the visual changes made to the virtual home, information about which DEEP are in effect and rationale behind such changes are presented to the users.

Context of Use

Who: This app is designed for Australian carers whom are typically above 35 in age, of mixed gender and not significantly familiar with tablet device usage. These carers are typically family members of those living with dementia.

What: These carers are using this app to visualise the physical changes they can make to their home and to learn about the justification for these proposed changes. These changes ultimately help enable people living with dementia.

Where: This app was not designed for use on the move; the typical usage context would be within the home or office environment, with low ambient noise so that the app can be heard, with a usage time of ten to thirty minutes.

[1] Further information about DEEP can be found here: http://www.enablingenvironments.com.au/dementia-enabling-environment-principles.html last accessed 22nd July 2016.

Usability Testing

The process employed for this project involved three phases. Phase 1 involved a heuristic evaluation performed with the developer to convey the rationale of changes proposed. The second phase involved DSTIL staff not involved in the project as participants for a usability test session, as depicted in Figure 2. Finally Phase 3 saw a usability test performed on site at Alzheimer's Australia with staff members that are not involved with this project serving as participants, as depicted in Figure 3.

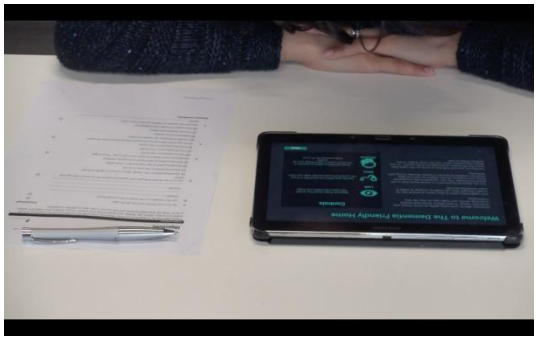

Figure 2: Internal usability testing with staff members of the Deakin Software and Technology Innocation Laboratory (formerly Swinburne Software Innvation Lab).

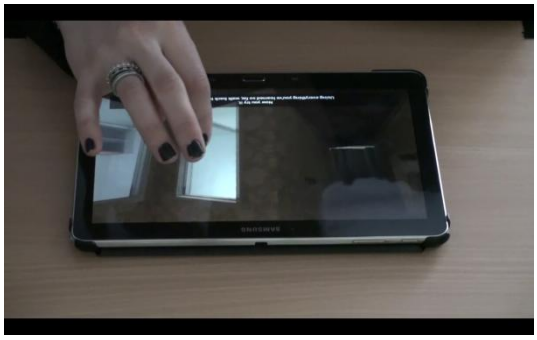

Figure 3: Usability testing with staff members from Alzheimer's Australia.

Phase 4 testing with carers was planned. However, as the carers were active care-givers, difficulties arose in organising a date where multiple carers could be available to serve as participants. In lieu of this, the client opted to forgo Phase 4 usability testing.

Usability test sessions were performed in-vitro; empty meeting rooms were used to isolate the participants from distracting stimuli. Phase 2 testing had 3 participants while phase 3 involved 6, in accordance with the cost benefit findings by Nielsen that testing 3 to 5 participants offer identification of most issues without the instability of spurious behaviours from single participants[2].

Tasks were designed to determine the validity of the design choices (e.g. How many bathrooms are there in the house?), functionality (e.g. There are clocks in the house, what time is it?), as well as the effectiveness and efficiency of information retrieval (e.g. What are the Dementia Enabling Environment Principles in effect when installing bathroom railings?) from the app. The findings of each phase of testing were implemented post a cost-benefit analysis of whether the changes could be effected within the budget and delivery schedule.

[2] Neilsen, Jakob. 2000. Why you only need to test with 5 users. https://www.nngroup.com/articles/why-you-only-need-to-test-with-5-users/ last accessed 22nd July 2016.

Release Version Refinements

The content displayed in the app is largely produced by Alzheimer's Australia. However, we collaborated closely with the client to select appropriate visual metaphors for each principle and to refine the information for tablet viewing with brief but informative content.

The screen captures used in this portfolio were extracted from Google Play. Figure 4 depicts the first person perspective used and what users see when exploring the virtual home after the tutorial. Users can tap anywhere on the app to move toward the surface that was tapped.

Figure 4: The "good" bedroom view of the user when exploring the house.

To ease the transition for users unfamiliar with the tap to move functionality, the floor plan was added to simplify movement for users from room to room without multiple taps, as seen in Figure 5. This offered the beneficial side effect of conveying a user's current position.

The information pane that slides out when a user interacts with an object in the room by pressing and holding the "?" is shown and annotated in Figure 5. The smiley faces were added and coloured to quickly convey to users the positive changes that can be made so as to afford quick information reference for users who did not want to use the app for a long time, or for users who want to refresh their understanding of the principles.

A dark colour scheme was initially used throughout the app as requested by the client, as seen in Figure 2. Based on findings from the usability testing, the colour scheme was changed to a light background with black text, while the contrast colour remained requested by the client.

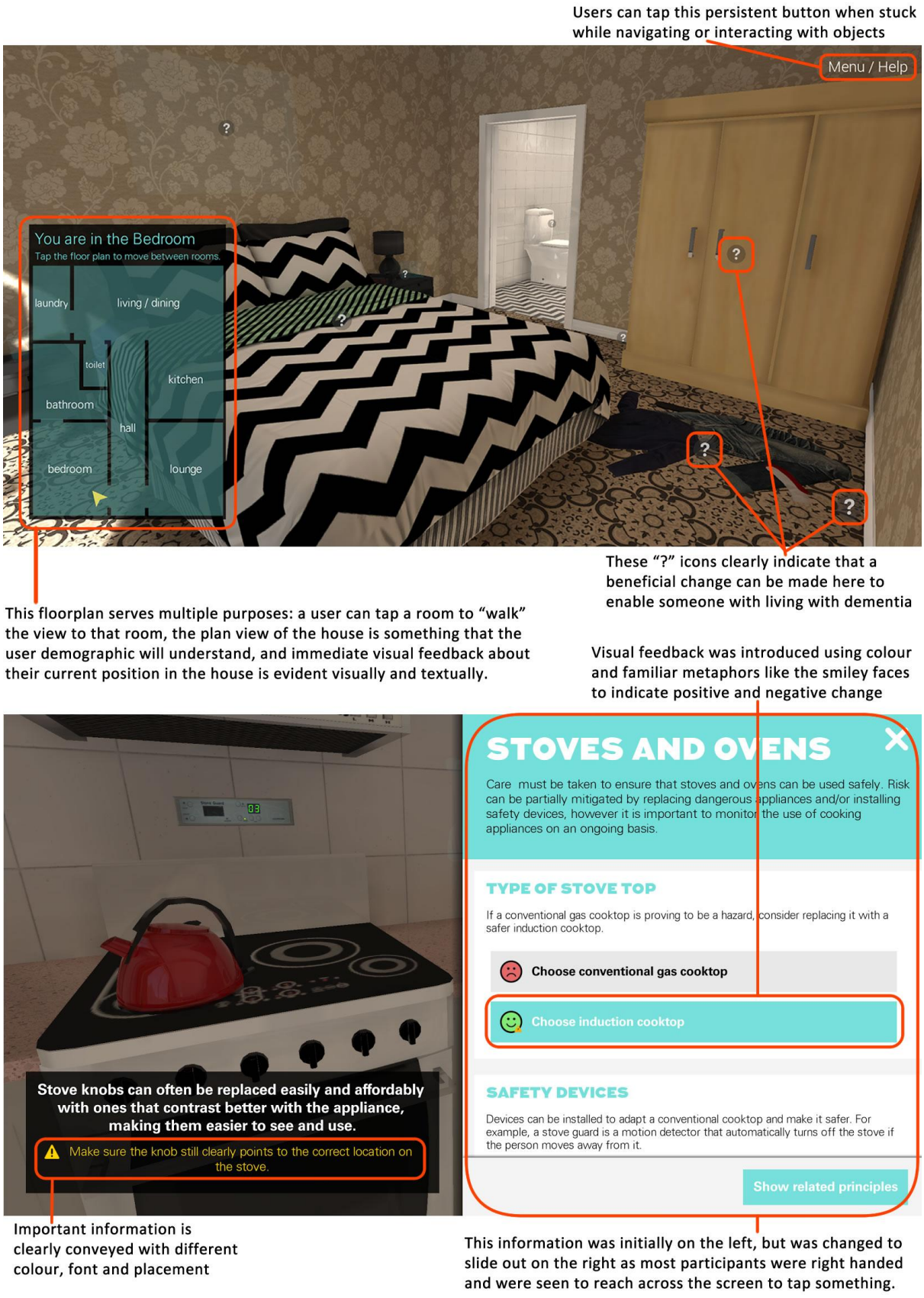

Figure 5: Refinements made based on findings from the usability testing.

Research

This section summarises my research that is relevant to the domain of human-computer interaction.

2016: Extracting Signal from the Noise of App Reviews (in review)

L. Hoon, "Extracting Signal from the Noise of App Reviews," PhD Thesis, 2016. Faculty of Science, Engineering and Technology, Swinburne University of Technology.

What is the app review landscape like? Is it the age of the information gold rush? How much information can we glean from app reviews?

This thesis explores 8.7 million App Store reviews to identify a means to filter out reviews that do not yield significant feedback, thus reducing the efforts required to analysis reviews. We find that i) 2 star reviews are the longest, ii) users tend to write only one review in their lifetime and 3) it is unlikely that an app can recover from a poorly rated launch version; it is ideal to rebrand the refined release.

2015: App Reviews: Breaking the User and Developer Language Barrier

link

L. Hoon, M. A. Rodriguez-García, R. Vasa, R. Valencia-García, and J.-G. Schneider, "App Reviews: Breaking the User and Developer Language Barrier," in Trends and Applications in Software Engineering, vol. 405 of Advances in Intelligent Systems and Computing, pp. 223–233, Springer International Publishing, 2016.

User review content does not map to actionable software engineering insights directly. This is further convoluted if software engineering terms are used inaccurately.

This work documents our attempts at bridging software engineering jargon and user review vernacular. We were able to reach precision of up to 0. 8 and recall of up to 0.72 post construction of an ontologies encapsulating emotion, functionality and quality.

ICT-Enabled Time-Critical Clinical Practices: Examining the Affordances of an Information Processing Solution

link

L. Hoon, F. T. C. Tan, R. Vasa, K. Mouzakis, and M. Fitzgerald, "ICT-Enabled Time-Critical Clinical Practices: Examining the Affordances of an Information Processing Solution," Australasian Journal of Information Systems, vol. 19, 2015.

In the chaos of a trauma bay, where patients arrive in critical condition, a trauma team can be up to twenty strong, depending on the ailments presented.

The Trauma Reception and Resuscitation (TR&R) project was performed in collaboration with The Alfred Hospital. This paper expands on our prior work documenting the development process of the TR&R system and how the support systems such as the Algorithm Designer component allow practitioners to enrich the medical processes within the system with neither significant special training nor the involvement of developers.

2014: Examining the Role of IS Affordances in Enabling Time Critical Clinical Practices: An Information Processing Perspective

link

L. Hoon, K. Mouzakis, R. Vasa, F. T. C. Tan, and M. Fitzgerald, "Examining the Role of IS Affordances in Enabling Time Critical Clinical Practices: An Information Processing Perspective," in Proceedings of the 25th Australasian Conference on Information Systems (ACIS '14) , Dec. 2014.

A decision support system was proposed and spearheaded by Professor Mark Fitzgerald, Director of Trauma Services at The Alfred.

This paper documents the usability testing phases of designing and implementing a system that can be integrated into the trauma bays without diverting attention from treatment. Since deployment, errors of omission have significantly decreased, shock management errors saw a 26% decrease and blood transfusions were halved.

2013: Awesome! Conveying Satisfaction on the App Store

link L. Hoon, R. Vasa, G. Y. Martino, J.-G. Schneider, and K. Mouzakis, "Awesome! Conveying Satisfaction on the App Store," in Proceedings of the 25th Australian Computer-Human Interaction Conference (OzCHI '13), pp. 229–232, Nov. 2013.

How do users convey their satisfaction? How pervasive is the use of "Awesome"?

This paper examines approximately 30,000 reviews from the Health & Fitness category in the App Store to find that reviews of five or less words do not offer much information beyond its star rating value. Furthermore, the terms used in reviews are consistent in positive and negative sentiment when contrasted against the star rating.

Socrates Mobile App Review Dataset

link K. Mouzakis, L. Hoon, and R. Vasa, "Socrates Mobile App Review Dataset." http://hdl.handle.net/1959.3/364882, Oct. 2013. Swinburne Research Bank, Swinburne University of Technology.

Post late 2012, the App Store and Google Play limited the exposure of app reviews by capping the maximum amount of reviews that can be viewed. This link serves to share our app review dataset of the Apple App Store's Health & Fitness category.

An Analysis of the Mobile App Review Landscape: Trends and Implications

link L. Hoon, R. Vasa, J.-G. Schneider, and J. Grundy, "An Analysis of the Mobile App Review Landscape: Trends and Implications," tech. rep., Faculty of Science, Engineering and Technology, Swinburne University of Technology, Melbourne, Victoria, Australia, 2013. http://hdl.handle.net/1959.3/352848.

How many reviews can my app expect? Which category should I release it in?

Building on our earlier efforts, we present our findings about the median number of reviews a top 400 ranked app can expect to receive in its first, sixth and twelve month, as well as whether certain categories exhibit propensity for super-, sub- or linear review growth.

2012: Simulated Influence of User Interaction with Mobile Devices amongst Pedestrians

link S. Pace, L. Hoon, C. J. Woodward, "Simulated Influence of User Interaction with Mobile Devices amongst Pedestrians," in Proceedings of the 24th Australian Computer-Human Interaction Conference (OzCHI '12), pp. 449–458, Nov. 2012.

Should we walk around using our phones? How is the human traffic flow impacted?

This paper offers a simulation of pedestrian traffic with and without mobile device usage to offer insights for city planning. Disruption is seen to correlate with distraction.

A Preliminary Analysis of Vocabulary in Mobile App User Reviews

link L. Hoon, R. Vasa, J.-G. Schneider, and K. Mouzakis, "A Preliminary Analysis of Vocabulary in Mobile App User Reviews," in Proceedings of the 24th Australian Computer-Human Interaction Conference (OzCHI '12) , pp. 245–248, Nov. 2012.

What is the typical vocabulary employed in app reviews by users?

We explore the app review text to find that reviews consist mostly of stop words.

A Preliminary Analysis of Mobile App User Reviews

link R. Vasa, L. Hoon, K. Mouzakis, and A. Noguchi, "A Preliminary Analysis of Mobile App User Reviews," in Proceedings of the 24th Australian Computer-Human Interaction Conference (OzCHI '12), pp. 241–244, Nov. 2012.

What are the typical properties of app reviews, from a statistical perspective?

We statistically analyse our dataset to find 2 star reviews to be most verbose and the Games category to enjoy the highest number of reviews, but also the shortest reviews in size.