Analogue styled user interfaces: An exemplified set of principles intended to improve aesthetic qualities in use

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Aesthetics, visualization, small screen device, navigation

Abstract

This paper discusses the aesthetics of interaction in general and particular parameters that might be vital for designing specific aesthetically pleasing user experiences. These parameters are applied to a design problem concerned with navigation in small screen devices; an illustrated design solution is explained and discussed.

Introduction

Our aim is to explore what we call *aesthetics in use*. By this we mean designing dynamic interaction to elicit a positive affective response from the user. This work therefore contrasts with aesthetic research done in the fields of graphic and product design, where the scope primarily includes the sensory forms of inanimate artifacts. We aim to complement and build upon this research to specifically address the aesthetic forms and responses to interactive media.

The area of aesthetics in use is poorly researched (Øritsland & Buur, 2000) and, furthermore, where work has been done, it has tended to focus on rich interactive environments, such as interactive narrative and immersive gaming environments. Our particular interest, however, is in the aesthetics of small screen devices, which are more mundane, limited and ubiquitous. Designing for aesthetics in use with these devices is important in order to design more enjoyable and more usable products,

two parameters we believe to some extent are mutually dependent (Crampton-Smith & Tabor, 1996; Tractinsky, Katz & Ikar, 2000).

In prior work (Djabri & Karlsson, 2001), we abstracted parameters for aesthetics in use by employing complementary creative techniques (e.g., Djajadiningrat, Gaver & Frens, 2000) in the context of a professional workshop. These parameters were derived from jointly studying workshop participants' favorite everyday objects in terms of their aesthetic qualities of use. All those objects were deliberately chosen to be physical, for we wanted to explore the characteristics of analogue artifacts, which mediate a continuous, almost playful interaction. One short example: the close match between the sound and motion of a car engine and the driver's foot on the gas pedal can be found to be engaging and aesthetically pleasing.

Engagement and Transparency

Two of the most interesting parameters defined during the workshop are what we call engagement and transparency; we now want to investigate whether we can use those parameters as (analogue styled) user interface design principles. They are similar to existing principles but not the quite the same. As a step in that investigation we are applying them to real problems to see how valuable they might be, but first let us discuss engagement and transparency a bit further.

We see engagement as an enhanced variation of feedback. Feedback is informing the user that the system has received the input and is doing something about it (typically communicated through a dialog or an animating icon). But in order to achieve engaging experiences, a much closer match between hand and eye is required (Ahlberg & Schneidermann, 1994). The continuity and immediacy of each transformation's visualization on the screen accomplish this match here. By making the transformations reversible (as much as possible) both during and after completion the interface becomes more pliable, thereby mimicking characteristics of physical artifacts that have been studied earlier in this project for their (subjectively perceived) aesthetical style of interaction. Engagement also includes the inherent pleasure that can be had through exercising skill and judgment in operation.

Now let us now turn to transparency. This involves the pleasure that can be had in having a clear and unambiguous outlook on the internal working of the device (Djabri & Karlsson, 2001). In this context, the term "internal working of the device" should be interpreted as the characteristics and interaction flows in the interface. To achieve an unambiguous outlook of interaction flows, or patterns, establishing causality and probability becomes important, especially from an aesthetic point of view (Laurel, 1991).

Applying engagement and transparency to a design problem

We are now trying to operationalize those principles to practical design problems in our domain, so that we can verify the validity of the earlier research work. We are aiming at designing analogue styled user interfaces for small screen devices, i.e., interfaces that have both the feel and possibilities of an analogue medium without superimposing its limitations. For the purpose of this paper we have chosen the task of navigating and selecting names in a 'Contacts' application, a common and important use case for mobile phones, but one that can often be both tedious and confusing.

When navigating an interface contextual awareness and predictability are important, especially so on small screen devices, due to the strict hardware limitations that constrain the possibilities from a design perspective. Often the system response to user input is abrupt; the user will be transported to a new screen environment as sudden as flicking a switch. When flicking a switch the result is always predictable (unless the bulb is broken); this is far from the case when it comes to small screen user interfaces. In addition to exploring the principles for aesthetic qualities in use outlined above, therefore, the design drivers for this case are to flatten hierarchy and supporting the user's ability of orientate themselves in navigating the device.

We have devised a solution that has two key features to achieve these goals, both tightly tied to engagement and transparency, as we will discuss after explaining the design.

1. The highlight/scrollbar component is visualized so that it affords paging when the component reaches the end or the top of the screen (paging has been found to be a source for disorientation). The highlight has 'springs' attached, these springs consist of segments, each segment represents a page of labels, the springs therefore functions as scrollbar (see scenario sketches for a visual explanation).
2. The need to have complete view changes is diminished by introducing a horizontal list containing details belonging a particular label on demand, the list is reversible without extra effort for the user. (Complete view changes easily make for a disruptive user experience).

Lets explain the design in the form of a scenario with accompanying sketches.

Scenario. I talking to someone about a common friend, Fredrik, and I want to show Fredrik's email address. The problem is I have two contacts labeled Fredrik Asplund, one imported from the corporate directory and then my personal friend, I have been too lazy to make them different. I scroll down to 'Fredrik' and the label details open (pic. 1,2). I shift the field horizontally by holding down a navigational key. The detail fields gets dragged halfway into screen (the point of balance) and then snaps into place, but if the key is released the point of balance it snaps out of the screen (pic. 2,3,4). Since I know this, I let the detail field containing

the email address almost past the point of balance. It is enough for me to see if it is the right one or not, which it is not, so I release the key and scroll down one label to the other 'Fredrik'. I now know this is the correct one and show my friend his email address (pic. 5). Afterwards, I decide to call another fried, Ulrick. I know he is two or three pages from the bottom of the list so I begin paging. I feel comfortable about not overshooting the page 'Ulrick' is on since I have a clear overview where I am and know when a paging action is imminent thanks to the spring movements and its segments. (pic. 6-10).
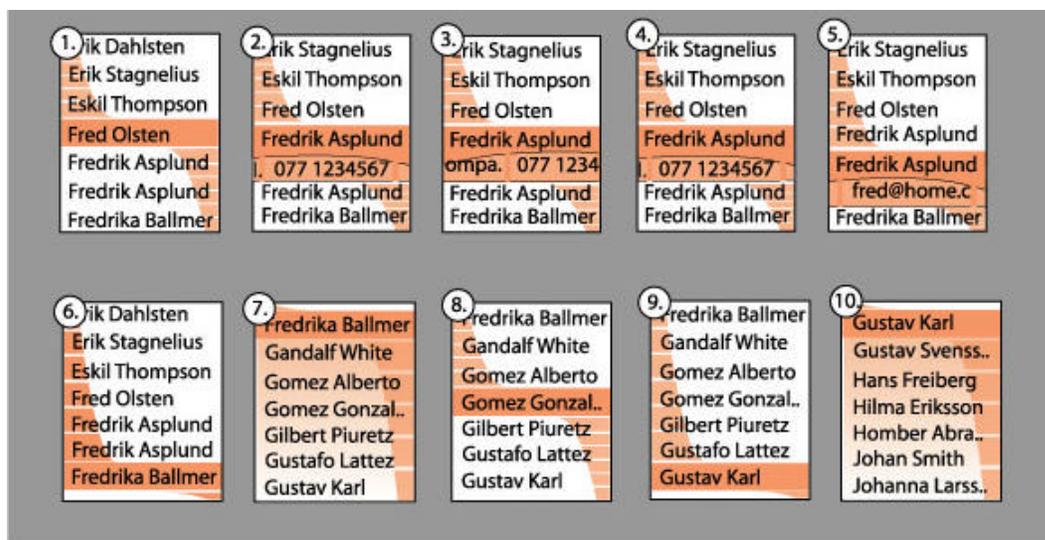
How engagement and transparency is used in the scenario. The highlight/scrollbar component is engaging in its tight coupling between hand and eye; the 'springs' becomes stretched and compressed which emphasizes the movement of the highlight and offering richer feedback. When the springs are compressed/stretched in the extreme the interface is warning the user of an imminent paging by mimicking analogue elastic attributes that imply contraction. Also in this state the number of pages in either direction is most visible due to the stretched out size of the segments in the spring, which makes the interface more transparent.

The horizontal list grows into the screen from underneath its label (a visualization poorly communicated in paper form), making details available on demand without contextual changes. Each field in the horizontal list has waveform, which communicates the visible field position in a circular list; the wave peak is the front end of the list and consequently the wave trough is the far end. These solutions are directly tied to transparency. The snapping behavior of vertical list fields borrows from analogue characteristics such as inertia, which gives the skillful user an opportunity to

have an advance view at the coming field without fully committing to selecting it. At the same time it is does nothing to punish the novice user. There is a pleasure to be had from exercising skill, a lesson learned from game design.

Both the behavioral characteristics of the 'springs' and the fields in the horizontal lists have likenesses to real-world phenomena when it comes to feel but does not resemble any one artifact or phenomena in particular. They do not, therefore, form a metaphor but a predictable interaction flow, or an interaction pattern and as such a potential source of pleasure (Laurel, 1991).

Future direction of work

The design solutions we so far have devised based on our principles for aesthetics in use needs to be takes further so that we can become more confident about the validity of the principles. One of the biggest challenges will be to find a valid method of evaluating something as subtle and subjective as aesthetical qualities. Such challenges are currently being addressed by a growing number of human factors researchers and designers (e.g., see Helander, Khalid & Po, 2001).

Acknowledgements

References

Ahlberg, C., & Shneiderman B. (1994). Visual information seeking: Tight coupling of dynamic query filters with starfield displays, in *Proceedings CHI'94: Human Factors in Computing Systems*, pp. 313-317.

Crampton Smith, G., & Tabor, P. (1996). The role of the artist-designer. In T. Winograd (Ed.), *Bringing Software to Design* (pp. 37-57). Reading, MA.: Addison-Wesley.

Djabri, F., & Karlsson, P. (2001). Rethinking interaction styles for scrolling on mobile phone interfaces, *Proceedings of the International Conference on Affective Human Factors Design*. London: Asean Academic Press.

Djajadiningrat, J. P., Gaver, W. W., & Frens, J. W. (2000). Interaction relabelling and extreme characters: Methods for exploring aesthetic interactions. In D. Boyarski, & W. A. Kellogg (Eds.), *DIS 2000 – Designing interactive systems: Processes, practices, methods and techniques* (pp. 66-71). New York: ACM Press.

Helander, M. G., Khalid, H. M., & Po, T. M. (eds.) (2001). *Proceedings of the International Conference on Affective Human Factors Design*. London: Asean Academic Press.

Laurel, B. (1991). *Computers as Theatre*. Reading, MA.: Addison-Wesley.

Øritsand, T. A., & Buur, J. (2000). Taking the best from a company history – designing with interaction styles. In D. Boyarski, & W. A. Kellogg (Eds.), *DIS 2000 – Designing interactive systems: Processes, practices, methods and techniques* (pp. 27-38). New York: ACM Press.

Tractinsky, N., Katz, A. S., & Ikar, D. (2000), What is beautiful is usable. *Interacting with Computers*, *13*, 127-145.