Interview with Gitte Lindgaard on visual appeal and aesthetics in human-technology interaction

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Abstract

Dr. Gitte Lindgaard is Director of the Human Oriented Technology Lab (HOT Lab) at Carleton University, Ottawa, Canada and Professor holding a NSERC/Cognos Chair in User-Centered Product Design. She published various articles on visual appeal and aesthetics in human-technology interaction. In this interview she summarizes the main outcomes of her research and discusses aspects for further research in this area of human-technology interaction.

Interview

[Sascha Mahlke]: You published some important papers on visual appeal in human-technology interaction? Can you tell a bit about how your interest on visual appeal developed and what the motivations are for your research in this area?

[Gitte Lindgaard]: My background is in hard-core experimental psychology, so venturing into these 'soft', 'fluffy' areas is really quite a departure, which I fell into more or less by accident. I was performing a usability evaluation of a Danish local Government web site for a friend back in the mid-1990s (Lindgaard 1999; 2007). The site was pretty bad usability-wise, so as predicted, my participants were unable to complete roughly half of the tasks I gave them. At the end of the session, as per usual, I asked questions about ease of use and satisfaction with the site. Of course, the satisfaction ratings were very low, so I thought that, if I let another group of people browse the site without asking them to complete the tasks, I'd find two things: (1) they would not encounter many of the usability problems and, (2) satisfaction ratings

should be significantly higher for this control group than for the test group because the former would not be hampered by usability issues. Alas - as predicted, they did not encounter usability problems, but the satisfaction ratings were just as low as for the test group.

Why could that be? One reason could be the fact that it was a Government site. People in Denmark interact with their local Government for everything in life, ranging from schools, nursing homes, taxes, to unemployment benefits, and so forth, so the ratings could represent the burden of reputation (people don't really like their governments very much). Another reason could be the color combination. The colors were extremely bright, saturated blue and yellow. I had just learned from readings in the psychology of arts that "two very bright primary colors superimposed on each other had been found to cause what the authors called 'maximum tension'" (Kreitler & Kreitler 1972). Now, while it is unclear from the paper what exactly they meant by 'tension', they probably referred to an increase in arousal. Perhaps the experience of these colors on this web site was situated on the downside of the classic U-shaped arousal curve because the color combination 'felt' unpleasant.

Some of our later experiments in which we attempted to 'unpack' the notion of 'user satisfaction' showed clearly that 'aesthetics' for want of a better word, is one important component of satisfaction at least in web sites (Lindgaard & Dudek 2003). In that part of our work, visual appeal is certainly associated with aesthetics, so hence my interest in both concepts.

I have always been deeply interested in how visual appeal affects human performance, especially in complex tasks. The way I think about it is this: let's assume that we have X amount of energy available to perform a cognitively complex task, for example, managing a telephone network or running a high-pressure petro-chemical factory. To the extent that I have to be annoyed with the computing tools I work with, perhaps by having to remember a lot of meaningless commands to do my work, which uses up some of the energy. Therefore, I no longer have as much energy available to concentrate on the task, but must devote some of it to aspects of the task that I shouldn't have to think about. A reduction in available energy must affect my task performance negatively. As a consequence, I will suffer from information overload and become stressed faster than if I could devote all my energy to focus on the task. Once I am stressed, I am no longer in what Csikszentmihalyi calls 'flow' (Csikzenthi-halyi 1990). In his language, 'flow' is a state in which task demands and human capabilities to master those demands match each other in perfect harmony; if I am 'out of flow', I am either under-stimulated, in which case I get bored, or over-stimulated, in which case I am anxious. Clearly, neither of these two states is desirable.

Now, to me, visual appeal need not always relate to how 'pretty' something like an interface is. It can be calming, for example, thereby helping to maintain the user's 'flow' state. Take the two examples in Figure 1 below. Both represent a telephone network in which there is a critical problem with one of the nodes, indicated in both instances by a bright red dot. Just by graying the color scheme as in the example on the right, the same information becomes much more visible. The simple addition of a red callout with a 'C' tells the network operator that the problem is critical and should be dealt with immediately. This is no more than good visual design.
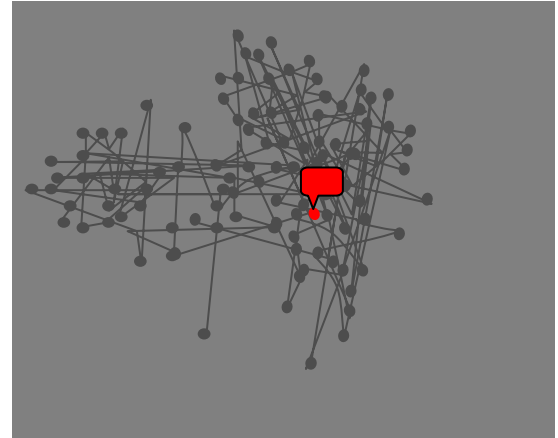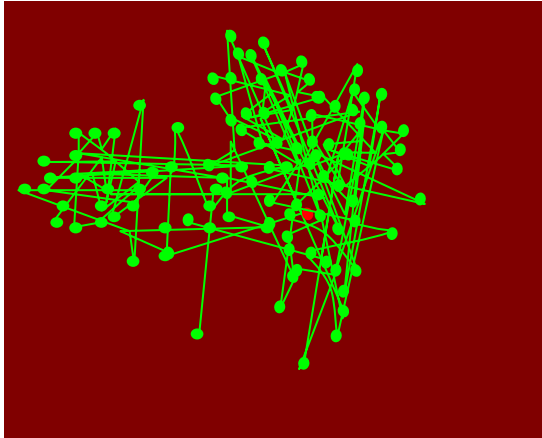
Figure 1: traditional (left) and improved (right) telephone network display

This very simple remedy is actually now part of a 'visual language', invented by my colleagues at Nortel, that is now on its way into the International Telecommunications Union as the standard for network management systems.
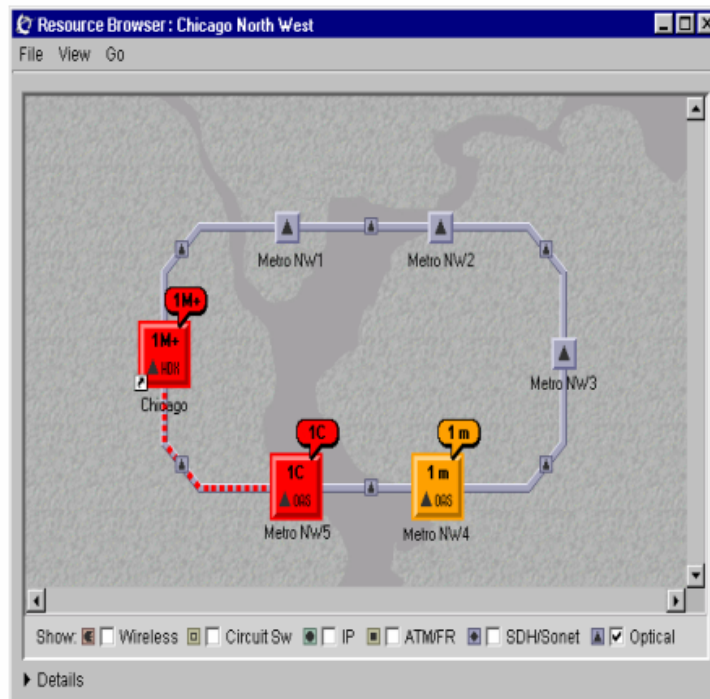

Figure 2: Network management system with Nortel's visual language incorporated

Figure 2 shows a rather simple elaboration of the concepts in the improved version above. The grey background actually shows part of Chicago that is recognizable to network management operators there – the solid grey is the river; the less dense grey is the land. Only the afflicted part of the network is shown rather than, as above, the entire network configuration of Chicago's telephone system. Clearly, communication is completely disrupted between the two nodes involved in the critical problem, both with the red callout, and the problem is beginning to affect the node shown in yellow. There are many other nifty details even in this simple example, but these are not important for the point I am trying to make here. Note, however, that the operator instantly knows exactly where the problem is, which one should be attended to first,

and the severity of it relative to other problems. From here he can simply click on the red box, drill right down to the affected equipment, and fix the problem remotely.

Compared to the original interfaces, the visual language incorporated in Figure 2 makes the operator's task so much more manageable – it helps to keep him 'in flow'. To me, that interface is both visually and cognitively appealing. This is how I think visual appeal can inform effective user interface design.

What would you say are the main outcomes of your research on visual appeal in human-technology interaction up to now?

Ok, I really treasure my modest contribution to user interface design like the one above. Having worked for many years in Human Factors in telecommunications, I have seen how user interface design significantly influences people's work how competent they feel; it can either undermine or enhance users' confidence in their own skills as well as affecting their overall health and well-being.

What role do emotions, affect or feelings play in your understanding of visual appeal?

More and more I am convinced that we are driven as much, if not more, by emotion as by cognition. In fact, I believe that the whole Cartesian dualist conceptualization of "affect-emotion" and "cognition" is a gross misunderstanding of the way human beings work. We like to think that we are "rational", but when you look closer even at so-called "rational" decisions, it turns out that the "rationality" is often a post hoc justification for decisions we have already made (see e.g. Klayman & Ha 1987; Kahneman, Slovic & Tversky 1982, several chapters). Once we have made a decision, we need to "prove" to ourselves that we made a good (or "right") decision (Klayman 1995). This is why the first impression is so important – it sets the scene for what will come after. Therefore, I cannot see how we can study anything to do with "appeal", be that visual, auditory, tactile, gustatory, or olfactory, in isolation from affect, emotion, feelings, and intuition.

One of your studies – the 50ms study (Lindgaard et al. 2006) – found its way into the general media (BBC, CNN, ABC News, Economist, Reuters, Wired, Spiegel Online in Germany ...). Why do you think this topic is so interesting for the general public?

Oh, I think it was just interesting to the press – not to the general public. Yeah, we can decide how much we like something we see after a very brief exposure time, so what? The press thrives on scandals and miracles. Our study, I believe, caught their imagination; it tells us something about the way the brain works, although the press certainly did not comprehend the finer details of the work or its implications. I doubt that Mr. Average would care two hoots about how his brain works.

I simply wanted to understand whether we are capable of forming an impression within a time frame that would classify it as a 'mere exposure effect' (Zajonc 1980). The big deal for me was that we were able to demonstrate that the first impression is, indeed, a mere exposure effect (Lindgaard et al. 2006). We now know that the first impression is "what my body tells me to feel" rather than "what my brain tells me to think." (Damasio 2000; LeDoux 1996; Norman 2004;)

My impression is that one important aspect most of the research on user experience in general and visual appeal in particular struggles with is how to relate user per-

ceptions to concrete properties of the system. What do you think could be a way to go in that direction?

I think this problem rests with the investigative methodologies that we apply to disentangle much of the complexity associated with visual and other sensory phenomena. That is, in our quest to be "scientific", we apply research methodologies originating in, and borrowed from, the natural sciences. Of course, many questions can and must be answered by those methods, but the range of questions we can ask, say, experimentally, is very limited. As a consequence, we are really limiting ourselves to questions that can be answered within the natural scientific paradigm.

Indeed, in our quest to isolate the role individual features play in a visual design, we are asking the wrong questions. One of my students investigated the effect of white space on the speed of locating and pointing to particular items in a web page. He found no effect, whatsoever (Zdralek 2003). Others have asked about things like "do pictures of people enhance the visual appeal/trust of a web page?" (Riegelsberger et al. 2003). The answer to both of these is – it depends. Ignoring context, the task the user is seeking to complete, the web page type, the site's main message, the intended purpose of the visit from both the user's and the vendor's perspective, any statement our findings allow us to make can only amount to a sweeping generalization that for sure won't apply to all contexts.

I think we need to become more holistic, taking into account many of these contextual issues that affect our judgments.

Where do you think we should go next with respect to broadening our understanding of aesthetics especially as it applies to human-technology interaction? Can you reveal where you are going next with this?

I think we need to come to terms with the sheer concept of aesthetics. Lavie and Tractinsky's (2004) paper is interesting, but there are some curious issues in their division of the concept into classic and expressive aesthetics. One of the features of classic aesthetics, for example, is 'aesthetics'! Really, we have still not agreed on what it is: are we talking about properties of objects or phenomena out 'there', or are we talking about our response, our feeling if you like, to such properties? (Lindgaard & Whitfield 2004). We tend to think about the concept as visual, but is hearing Beethoven's ninth symphony, for example, not an aesthetic experience? Is the ambience, the intangible 'feeling' a restaurant generates in us not 'aesthetic'? We desperately need to define what exactly we mean when we talk about 'aesthetics', especially now as we are working more and more with multi-sensory, multimedia, multimodal interactive technologies.

Our work – well just briefly, we are doing some work in olfactory primers, trying to learn the potential effect on both preferences and performance of different odors (Lauriault & Lindgaard 2006). Likewise, we are trying to understand the link between perceived usability, visual appeal, and trust, and we are working on what happens to the first impression in the longer term.

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