The Age of the Senses

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Smart materials and related autonomous technologies offer the potential to automate and hide much of the tedium of our everyday lives: logistics, transportation, electricity consumption in our homes, connectivity, or the management of autonomous systems such as robot vacuum cleaners. Combined with the growth in ubiquitous- and Internet of Things-based systems there is now the opportunity to make significant improvements in how technology benefits everyday life.

Yet existing systems are beset with manifest human interaction problems. The fridge warns you with a beep if you leave the door open, the washing machine signals when it is finished, or even chainsaws now warns you when you have been using them for too long. Each individual system has been designed with a particular, limited, interaction model: the smart lighting system in your apartment has not been designed for the sharing economy, the lawn mower robot might run off and leave your garden. Different parts of your entertainment system turn the volume up and down and fail to work together. Each smart object comes with its own form of interaction, its own mobile app, its own upgrade requirements and its own manner of calling for users' attention.

The interaction models for these systems have been inherited from the desktop-metaphor, and today, each comes with their own mobile app using non-standardised icons, sounds or notification frameworks. When put together, the current forms of smart technology do not blend, they cannot interface one-another, and most importantly, as end-users we have to learn how to interact with them each time, one by one. The seams are hidden from view, and we have no idea how to work with these systems when they fail – be it due to lack of connection, battery failure, or other problems.

I want to bring up three interconnected ideas that could shape the design practice in the years to come.

Soma-Based Design

First, I would love to exclaim "This is the age of the senses!" as I believe that would address some of the problem outlined above. But right now, I am sceptical as to whether this is the path industry will take. In fact, from what we have seen so far, it seems as if all our big companies are making the world even more focused on the language-, symbolic-, language-oriented interaction dialogues: Siri, Cortana, Nest are but a few examples of this development.

But in my view, in order to live in a world full of interactions, we need to involve more of our senses, be more subtle, integrate interactions more with the environment, tone down the demands on our attention. We should be returning to the original ideas of Mark Weiser and how he saw ubiquitous computing as "walking through a forest", as calm computing, where interaction is downplayed, integrated, made part of our bodily movements.

This is why I decided to focus on aesthetics of soma-based design interesting [1,2]. In soma-based design, we emphasise a first person, aesthetic, sensual experience. In the interaction, *immediacy*, *synchronization* and *correspondance* is key. Ingold [3] introduced correspondence to describe a type of intimate relationship between a subject and an artefact (such as between a cello player and his cello). The immediate and synchronized feedback should rhyme with the rhythms and flows of the body or practices in our everyday life in a way that the interactive system is perceived more as an extension of the body than as a separate entity or communication counterpart.

To create these systems the designer's lived experience must be in place in order to feel the fine nuances of different movements, tactile experiences or mirrorings of our bodily processes in interactive design. By combining the perspective of our own soma (i.e. the "living, purposive, sentient, perceptive body or bodily subjectivity") with our designerly aesthetic sensitivities, we can create interactions that engage us without being solely an intellectual, visual engagement, pulling our attention.

Smart Implicit Interaction

But we also need to orchestrate the effects of all of that data that is collected about us – as a layer on top of everything. In some senses this is like personal computing before the desktop metaphor, the Internet before the web, or mobile computing before touch interfaces. In short, IoT lacks its killer interface paradigm. It could be that the solution lies in somaesthetic solutions, or more generally, in what we could name *smart implicit interaction* [4]. Implicit interactions stay in the background, thriving on data analysis of speech, movements, and other contextual data, avoiding unnecessarily disturbing us or grabbing our attention. When we turn to them, depending on context and functionality, they either shift into an explicit interaction – engaging us in a classical interaction dialogue (but starting from analysis of the context at hand) – or they continue to engage us implicitly using entirely different modalities that do not require an explicit dialogue – that is through the ways we move or engage in other tasks, the smart objects responds to us.

Data as a Design Material

When it comes to data, we should start treating the data and data analytics as yet another design material. It should be placed alongside all the other materials: sensors, actuators, wireless communication, interactive textiles, visualisations, screens and so on. "Data as design material" will be a key insight we need to communicate to young design students. This in turns requires tools that make data and data analytics accessible to us as designers. It also requires human values to be at the core of our design practice.

Challenges to Design Research

The existing design knowledge and methods for web and mobile apps design are successfully addressing and emphasising symbolic, language-oriented and predominantly visual interactions. This stands in stark contrast to the knowledge and methods employed by those who successfully address somaesthetics and implicit interaction. The difference is not only in which questions are asked about the computer

models of our movements, but entails a qualitative shift from a predominantly symbolic, language-oriented stance, to an experiential, felt, aesthetic stance permeating the whole design and use cycle. While design has always engaged with form-giving and aesthetics, design research, in particular interaction design, needs to return to those roots, to the basis in human movement, somatics and first person perspectives.

References

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