

# Out of Touch

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## ABSTRACT

How blind, visual impaired and in fact every sensible human being can benefit from haptic architecture

solutions that will create a more comfortable environment for not only blind and visual impaired but all inhabitants. In the final paragraph we mention a haptic design strategy for architects.

## General Terms

Design

## Keywords

Design for all, inclusive design, tactile experiences, haptic architecture, research through design

## 1. INTRODUCTION

Last year, Bartimeus, the institute for blind and visual impaired, and Zilvergrijs, a Dutch foundation for sensible architecture, worked on a research project that aims for a more sensible architecture. Together with journalists, scientist, architects, blind and visual impaired we researched how we can design more comfortable buildings by focusing on a more sensible approach on architecture? To answer this question we studied literature about the senses related to design and architecture as well as research through design. By interviewing people, using experiences from architects, designers, blind and visual impaired and using insights of environmental psychologist we tried to get a better understanding of sensible architecture. The outcomes will be published in a publication (launched in November) and is accompanied with an audio documentary in which journalist interviewed 10 blind and visual impaired people in public buildings about their experiences in the building.

It seems rather obvious that an environment with a lot of attention for haptic elements is easier to navigate for blind and visual impaired people. If an environment has strong haptic cues, it helps them to easy distinguish rooms and recognise specific areas. But blind or visual impaired don't want buildings that – with specific 'adaptations' confirm their 'handicapped' position. In our research we find many interesting ways to build an environment with a strong focus on haptic experiences that is comfortable for all users. This *Design for all* or inclusive design approach was a leading principle in our research.

In this paper we will present some insights on haptic architecture based on this literature research as well as the interviews and design research process (research through design).

In the first paragraph we will roughly sketch why we think we are getting out of touch and why this is a 'problem' when it comes to our built environment. The second paragraph deals with how we experience and interpret tactile stimuli. In the third paragraph we outline our research through design approach and sum up some haptic design approaches and

## 2. SEEING WITH THE SKIN

In our adult life touch seems to play a rather marginal role. A lot of hand-work nowadays is replaced by machines and computers. Even designers, artists and architects tend to start their research and sketching process behind the computer. The sociologist Richard Sennett fears we are getting out of touch. In his beautiful book *The Craftsman* he pleads for more 'hand' craft. The sociologist, who is also a merit musician, thinks that this digital and mechanical age is destroying craftsmanship and with that a specific kind of knowledge. An opinion that is shared with the finish architect Juhani Pallasmaa. He even thinks that we can think with our hands and see with our skin which are also the titles of two of his books on this topic (*The Thinking Hand* and *Eyes of the Skin*). Because all our senses are eventually extensions of our sense of touch, we should, according to Pallasmaa, focus primarily on our tactical experiences. In his opinion this means that making models by hand or manually sketch the outlines for a building are crucial activities in order to build meaningful and habitable buildings. Before we explore the importance of the tactile experiences and its role in the built environment we first introduce some tactile strategies with which we can distinguish material experiences, navigate and orientate and which might create more comfortable environments.

## 3. TACTICAL SENSE & SENSE OF TACTICS

At the age of four, children are able to distinguish the physical differences between materials (smoothness, flexibility), feel differences in temperature (thermoception) and pain (nociception). All these experiences we call cutaneous tactile experiences.

Except from these we have a sort of inner sensor that knows when we stand on a slope, or when we are walking upward, how hard to shake a hand and with how much 'pressure' we can handle a raw egg. This tactile sensing, with which we can perceive the spatial position of our body and dose our muscular strengths is called proprioception. For architects this is a very 'useful' aspect to take into account, for instance by creating an upwards entrance (paragraph 3).

### 3.1 Tactile strategies

We usually need to scan an object on many ways (moving it up, down, lifting, pressing, stroking) to perceive all crucial information especially when it concerns large objects that we

can't encapsulate at once. With our visual sense we can immediately perceive an overview of the environment, but with our tactile sense we sequentially perceive the environment. This appeals for a lot of memory capacity as well as concentration. Therefore it is crucial that architects create buildings with 'easily perceived' tactile elements (see paragraph 3).

### 3.2 Active, passive, dynamical

Except from this active way of scanning, the Belgian scientist Herssens and Heylighen also distinguish passively and dynamically touch (Herssens & Heylighen<sup>1</sup>). Most of us perfectly notice (passively) changes and movements in our environment such as temperature variations or changes in altitude. Also we easily recognize subtle changes in foundation; we immediately feel if we move from the carpet to the wooden floor. We even feel these changes 'through' objects, for instance while riding a bike or drive a car. Blind or visual impaired can feel these differences through their stick. This experience through objects is what Herssens and Heylighen call the dynamical touch.

In general the active way of scanning gives information about orientations and passive about the atmosphere in an environment, whereas dynamical scanning is the 'in between' experience. According to Herssens and Heylighen architects should focus on these three aspects by working in different planes (paragraph 4).

In the built environment we use tactile experiences for orientation as well as for our 'sense of comfort and well being' in a room. Our tactile sense is the only sense organ with which we can change our environment, since we can replace, move or reform objects. Because of this strong interaction, Herssens and Heylighen are of the opinion that our tactile experiences are crucial in our daily environments.<sup>2</sup>

## 4. HAPTIC DESIGN SOLUTIONS

Especially for blind and visual impaired people the feet or hands can 'organize' the world for them. By recognizing tactile marks such as differences between clay, asphalt, pavement or carpet they get easily information about rooms. It helps of course if architects (both exterior and interior) support this by making strong marks, f.e. discriminating various rooms with different materials. This not only provides tactile cues but also creates acoustic variation (paragraph 4). Blind and visual impaired prefer doormats. The different materials have a different language for them. A smooth floor 'tells' them that this is a free space, whereas a rough, bumpy floor communicates that the user can expect some obstacles. Instead of the material itself, also the thickness and altitude communicate. By means of our proprioceptive perception we

<sup>1</sup> *Blind Body Language: Haptics in the homes of Congenitally Blind*. J. Herssens en A. Heylighen, in: In Clarkson, P., Langdon, P., Robinson, P. (Eds.), *Proceedings of the 5th Cambridge Workshop on Universal Access and Assistive Technology*. (pp. 109-118). Cambridge (UK): University of Cambridge, 2010.

<sup>2</sup> Haptic Design research, a blind sense of place, J. Herssens en A. Heylighen, in: *The Place of Research, the Research of Place*. Proceedings of the ARCC/EAAE 2010 International Conference on Architectural Research. ARCC/EAAE (in print).

feel when a path goes upwards. Architects can 'use' this by making an upwards entrance of a building; blind and visual impaired will get the 'message' that they will walk towards something.

The same is true for stairs. Often stairs are perceived as obstacles in buildings. But blind people can perfectly walk stairs as long as they have a 'good rhythm' and if the first and final step are clearly marked (for instance with a carpet).

Marks could also enhance the orientation; think of noticeable buttons in an elevator, braille on the stair rails. With big public buildings a miniature relief model of the building could give crucial information about the routing.

Because of the mentioned tactile strategies we need to touch an object or environment in multiple ways. Big rooms are hard to 'perceive tactically'. In long isles a shelf on a wall could give support. A nicely decorated shelf [image 1] could even give extra tactile pleasure. As George Kabel, a blind philosopher and sculptor in our interview mentioned "it would be great if architects would focus more on tactile pleasures. Normally if people need to wait they start looking around; for blind or visual impaired it would be great if they could 'feel around' while waiting; why haven't architects or designers focused yet on creating nice carvings in the counter desks?" The Dutch architect Marco Matic designed tactile licence plates with a 3d image, that both for blind, visual impaired and people with normal vision gives aesthetic pleasure [image 2].



Image 1: carved shelf



Image 2: tactile licence plate with 3d image

### 4.1 Atmosphere

Of course materials have a strong impact on our feelings. Soft and natural materials are often perceived as more friendly. According to the Finnish architect Pallasmaa using non natural materials can have devastating mental influences. Since these mechanically produced materials are not aging. The timeless perfection of these materials is according to

Pallasmaa not in line with our mental need to see things aging.<sup>3</sup>

The tactile expert Marieke Sonneveld (University of Delft) thinks there are a lot of clichés in this perspective. Nowadays products with soft touch are popular, but we can't only enjoy soft and caressing materials. We need contrasting experiences. The Belgian scientist Herssens en Herssens emphasize from their research that blind and visual impaired prefer firm objects with a clear and fixed structure.<sup>4</sup>

Petra Blaise shows in her book *Inside Outside* the impact of fabric in environments. Fabric not only can 'exclude' the night but also distinguish rooms, feel comfortable and enhance acoustic qualities.

## 4.2 Design language

A lot of our daily objects are restyled frequently. There are for instance numerous design solutions for taps; some ones you have to push, others you need to swing or lift to get water out and there are even ones you have to use your feet or infrared sensors. The same is true for flushing the toilet or light switches. These variations make it hard, not to say impossible, for blind to visit public bathrooms. As the blind American architect Downey puts it: "I frequently have to search for the towel, I don't know how to open the tap and if I get cold or hot water, and search long for the dustbin. Knowing that public toilets are far from clean, I don't feel comfortable touching extensively. So if possible I avoid public toilets." Of course we would not like to plea for a universal form language, but for public environments it would be recommendable to have some basic design rules for public buildings.

## 5. HAPTIC ARCHITECTURE

Regarding the abovementioned aspects we think it is crucial that architects and designers focus more on haptic experiences. The Belgian scientists Herssens en Heylighen plea for a more haptic architecture.<sup>5</sup> In their opinion architects should divide their design in planes instead of volumes. They distinguish guiding, moving and rest planes. Every plane has one or more functions that determine the choice of materials and decoration.

Designing for the moving plane means that architects focus on elements that stimulate orientation and movements in an environment. This can be done with tactile accents like a doormat in a transition room, curtains to divide spaces with a

<sup>3</sup> Pallasmaa, *The Eyes of the skin*, p 30

<sup>4</sup> Zie bv. (Herssens & Heylighen 2009) *A lens into the haptic world*. J. Herssens en A. Heylighen, in: *Proceedings of Include 2009*. London: Royal College of Art, Helen Hamlyn Centre, 2009.

<sup>5</sup> Haptic Design research, a blind sense of place, J. Herssens en A. Heylighen, in: *The Place of Research, the Research of Place*. Proceedings of the ARCC/EAAE 2010 International Conference on Architectural Research. ARCC/EAAE (in print).

Challenging Architects to Include Haptics in Design: Sensory Paradox between Content and Representation, J. Herssens en A. Heylighen, in: Leclercq P., Martin G., Heylighen A. (Eds.), *Designing Together*. Liège: Editions de l'Université de Liège, 2011 (in print).

different functionality and materials that correspond with the function of a room.

If the atmosphere in a room is more important than the movement or orientation, most information is perceived passively (meaning temperature or air pressure changes). In that case architects should focus primarily on the rest plane meaning creating enough spaces to relax, sleep or relax. Designing for the guiding plane, means taking into account the active (conscious touching and moving) and dynamical touch (by means of a device, object or stick). In this case architects should focus on the structure of an environment and use elements that support the routing, for instance a shelf on a wall, clear (material) distinctions between rooms and no unnecessary obstacles. In this way architects are 'forced' to think of more haptic design solutions within the constructing process.

## 6. DESIGN FOR ALL

Although architects have a strong voice in framing the built environment, we have to notice that they work in a widespread field in which many actors and stakeholders (housing companies, project investors, municipalities and so on) are involved. Not the least to mention the users (habitants) themselves. To create a more haptic approach on architecture all the actors in the field should be involved. Since the architectural field is 'dominated' by an ocular-centric perspective, this is not an easy task. It helps though, that tactical design solutions are not highly complicated. The abovementioned guidelines are not costly and most 'solutions' are rather obvious. Moreover with a more haptic approach we might even save budget, because we might avoid stigmatised adaptations.

The starting point in this process is the user himself. He needs to have a crucial voice in the process. We discovered that by talking to blind and visual impaired - experience the built environment through their eyes- that we can easily alter the environment with cheap, obvious design solutions so that it is easier to navigate and more comfortable for all users.

## 7. SUMMARY

Tactile experiences are of crucial importance to navigate and feel safe and comfortable in buildings. We active, passive and dynamically touch our environment. Since we perceive so many information by tactile experiences and because we can alter our environments by touch, the tactile sense is crucial to take into account in our daily environments. Especially for blind and visual impaired who are highly dependent on tactile experiences.

Architects could focus on haptic architecture by dividing a building in rest, guiding and moving planes (Herssens & Heylighen). Each plane needs corresponding haptic design solution concerning structure, material and design language. Some think that the use of natural, aging materials is preferable (Pallasmaa). Blind and visual impaired prefer vast materials (Herssens & Heylighen), and in general we like contrasting materials (Sonneveld). For public environments like rest rooms, it is strongly recommendable to look out for a clear 'universal' design when it comes to placing of dustbin, toilets and sinks (as well as taps, light switches and son on). Because tactile architecture is highly dependent on the users involved in the building (personal preferences, working conditions, requirements and so on) it is impossible to give uniform guidelines regarding tactile architecture. By using design research experiences of the users themselves we get a

better understanding that helps us to create, in the words of Pallasmaa, meaningful tactile buildings for all!

## 8. REFERENCES

- [2] Herssens, J. en A. Heylighen. 2009. A lens into the haptic world. In: *Proceedings of Include*. Royal College of Art, Helen Hamlyn Centre, London.
- [3] Herssens, J. en A. Heylighen. 2010. Blind body language; haptics in the homes of congenitally blind. In: P. Clarkson (et al.) (eds). *Proceedings of the 5th Cambridge Workshop on Universal Access and Assistive Technology*. (pp. 109-118). University of Cambridge.
- [4] Herssens, J. en A. Heylighen. 2011. *A Framework of Haptic Design. Sensory Paradox between Content and Representation*. In: P. Leclercq (et al.) (eds). 14th international Conference on Computer Aided Architectural Design (pag. 685-701). CAAD Futures Luik.
- [5] Herssens, J. *Designing Architecture for More. A Framework of Haptic Design*. Doctoral Thesis. PHL-University Hasselt University Leuven.
- [6] Herssens, J. en A. Heylighen. *Haptic design reserach; a blind sense of place*. Proceedings of the EAAE/ARCC 2010 International Conference on Architectural Research.
- [7] Kessels, M. 2009. *Ruw. Bezige Bij*.
- [8] Pallasmaa, J. 2009. *The Think Hand, existential and embodied wisdom in architecture*. John Wiley and Sons Ltd.
- [9] Pallasmaa, J. 2005. *The Eyes of the skin, architecture and the senses*. Wiley-Academy Great Britain.
- [10] Sennett, R. 2010. *The Craftsman*. Penguin Books Ltd.
- [11] Sonneveld, M.H. 2007. *Aesthetics of tactual experience*. Unpublished doctoral dissertation. Delft University of Technology.