

**Aarhus School of Architecture // Design School Kolding // Royal Danish Academy**

## **Architectural Aesthetics as a Catalyst of Agency**

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*Publication date:*  
2020

*Document Version:*  
Publisher's PDF, also known as Version of record

[Link to publication](#)

*Citation for published version (APA):*  
Chebotareva, P. (2020). *Architectural Aesthetics as a Catalyst of Agency: A Design Exploration of Affordances, Atmosphere and the Anthropocene*. Arkitektskolen Aarhus.

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ARCHITECTURAL  
AESTHETICS AS A  
CATALYST OF AGENCY

—

A DESIGN EXPLORATION  
OF AFFORDANCES,  
ATMOSPHERE AND  
THE ANTHROPOCENE

PHD DISSERTATION BY  
POLINA CHEBOTAREVA

SUBMITTED TO  
THE AARHUS SCHOOL  
OF ARCHITECTURE

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Architectural Aesthetics as a Catalyst of Agency  
– a design exploration of affordances, atmosphere and the Anthropocene  
PhD dissertation by Polina Chebotareva  
Submitted to the Aarhus School of Architecture



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Printed and bound by Frederiksberg Bogtrykkeri A/S

With love and boundless gratitude, to Galina, Karsten and Moshi.  
With love and fond childhood memories, to my grandparents,  
Dr. Marina Chebotareva, Dr. Evgeniy Chebotarev, Nona Skladtchikova and  
Yuri Skladtchikov.

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## ABSTRACT ENGLISH

This PhD thesis explores architectural aesthetics as a catalyst of agency.

Both aesthetics and agency are approached from the perspective of perception. Following the theory of atmosphere (Gernot Böhme), aesthetics is understood as atmosphere – the multisensory and affective perception of the surroundings. Following the ecological approach to perception (James Gibson), agency is interpreted as the perception of new opportunities for action, referred to as affordances. The exploration follows the method of concept-driven research through design. The design process is informed and driven by the concepts of atmosphere, affordances and the Anthropocene. And the design drives the conceptual analysis of the three concepts. In this way, design and conceptual analysis enrich each other to arrive at the following hypothesis: multisensory interactions on the approach to an affordance create a shift in attention that stimulates explorative behavior and draws attention to the atmosphere and global issues of the Anthropocene.

This hypothesis is expressed in the architectural installation, Urban Carpet. Urban Carpet was developed in collaboration with Elias Melvin Christiansen and installed on the traffic island in front of Banegårdspladsen in Aarhus, Denmark, from August 29 to September 5, 2018. The installation was a thin flexible membrane of small wooden pieces charred on the surface and woven together to cover the whole traffic island. People walked over the installation on their way across the road. Walking over the installation produced a subtle sound and the charred wood materiality gave off a faint smell. Observations showed that people interacted with the sound and surface of the installation with their feet. These interactions stimulated explorative behavior and the perception of new possibilities for action: people began walking across the traffic island and interacting with the edges of the two elevations on the traffic island. These observations confirm that Urban Carpet had an effect on people's perception of new possibilities for action by activating the body through multisensory interactions.

The thesis thus arrives at its main conclusion: architectural aesthetics can catalyze agency by increasing the multisensory expression of people's actions on the approach to an affordance and, thereby, stimulating explorative behavior. Future research can develop and challenge this conclusion by exploring other strategies for stimulating a shift in attention on the approach to an affordance and by working with architectural aesthetics in other locations. Overall, this research project contributes with new knowledge about the ontoethics of architecture and offers a new interdisciplinary perspective to critical spatial practice.

## ABSTRACT DANISH

Denne ph.d.-afhandling udforsker arkitektonisk æstetik som en

katalysator for den menneskelige handlekraft. Både æstetik og handlekraft er fortolket ud fra et perceptionsperspektiv. Baseret på atmosfæreteori (Gernot Böhme) er æstetik forstået som atmosfære – den multisensoriske og affektive perception af omgivelserne. Baseret på økologisk perceptionsteori (James Gibson) er handlekraft forstået som perception af nye handlemuligheder, også kaldet affordances. Udforskningen følger metoden koncept-drevet research through design. Designprocessen er informeret og drevet af koncepterne atmosfære, affordances og Antropocænen, og analysen af disse koncepter er drevet af designprocessen. På denne måde beriger design og konceptuel analyse hinanden og leder til formuleringen af følgende hypotese: multisensoriske interaktioner på en persons vej mod en affordance kan skabe et skift i opmærksomheden, som stimulerer en eksplorativ adfærd og drager opmærksomheden mod atmosfæren og de globale problemstillinger i Antropocænen.

Denne hypotese blev udtrykt i den arkitektoniske installation, Urban Carpet. Urban Carpet var udarbejdet i samarbejde med Elias Melvin Christiansen og installeret på trafikøen foran Banegårdspladsen i Aarhus, Danmark, fra 29. august til 5. september, 2018. Installationen var en tynd og fleksibel membran af små stykker træ, der var brændt på overfladen og vævet sammen, så de dækkede hele trafikøen. På vej over fodgængerovergangen gik mennesker oven på installationen. Installationen lavede en afdæmpet lyd, når mennesker gik over den, og dens materialitet havde en svag duft. Mine observationer viste, at mennesker interagerede med installationens lyd og overflade med deres fødder. Disse interaktioner stimulerede eksplorativ adfærd og perception af nye handlemuligheder: mennesker begyndte at gå på tværs over trafikøen og interagerede med kanten af de to forhøjninger på trafikøen. Disse observationer bekræfter, at Urban Carpet påvirkede menneskers perception af nye handlemuligheder ved multisensoriske interaktioner, som aktiverede deres kroppe.

Således kommer afhandlingen frem til hovedkonklusionen: arkitektonisk æstetik kan katalysere den menneskelige handlingskraft ved at forstærke den multisensoriske udtryk af en handling på en persons vej mod en affordance og derved stimulere eksplorativ adfærd. Fremtidig forskning kan udvikle og udfordre denne konklusion ved at udforske andre design strategier for at skabe en skift i opmærksomheden på en persons vej til en affordance og ved at arbejde med arkitektonisk æstetik på andre steder. Samlet set bidrager denne forskningsprojekt med ny viden om en ontoetisk tilgang til arkitektur og et nyt tværfaglig perspektiv til critical spatial practice.

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## INTRODUCTION

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The main argument of this thesis can be summarized in the following sentence: Aesthetic features in everyday environments that enhance the expression of people's actions are important because they can stimulate the perception of new action possibilities. I summarize this argument and the topic of this thesis in its title – architectural aesthetics as a catalyst of agency. And, as implied in the subtitle, I unfold the topic and reach this argument by linking the concepts of affordances, atmosphere and the Anthropocene in a design process that comprises the empirical part of my research. This is the subject matter of this thesis. In the next chapters, I introduce the theoretical framework, empirical method and design process, and my conclusions. Here, in the introduction, I open the topic by, first, presenting three sources of inspiration that were formative for the formulation of my research project and, following this, contextualizing the topic within the larger field of architectural research.

The three sources of inspiration that prompted me to formulate this research project are the artwork 'Erosion' by artist Olafur Eliasson, the 'Empowerment of Aesthetics' exhibition curated by landscape architect Stig Lennart Andersson and the issue of insensitivity identified by philosopher and sociologist Bruno Latour. Unfolding each source of inspiration in the early stages of this research project led me to identify the three concepts that became defining for my theoretical framework and empirical design exploration – affordances, atmosphere and the Anthropocene. I begin the introduction by describing the three sources of inspiration and their connection to the theoretical concepts. Each concept is described in depth in the next chapter.

My research project explores and formulates a link between the three concepts in a research through design process. I therefore continue the introduction by briefly presenting my empirical method and exploration of the link between the three concepts (and sources of inspiration), and contextualizing this within architectural research. In particular, I discuss this exploration in relation to critical spatial practice, agency and the ethics-aesthetics debate in architecture. I conclude the introduction with my research questions – the cornerstone of my research project.

EROSION AND AFFORDANCES In 1997, the Danish-Islandic artist

Olafur Eliasson created a puddle in front of the entrance to one of the exhibitions at the Johannesburg Art Biennale by flooding a nearby water reservoir and guiding the water in a stream through the city. Guests to the exhibition had to jump over the puddle to enter. This puddle was an unannounced artistic intervention titled 'Erosion'.



In a later publication, Olafur Eliasson described the intervention as a 'friction' (Eliasson, 2009) and made the argument that friction is needed to see the city and oneself from a different perspective. According to Eliasson, friction in urban space is necessary to exercise criticality (Ibid, p. 132).

*'This change in the urban environment created a slight friction, an interruption of the way in which the people normally moved. Friction is needed in order to exercise criticality; it offers the possibility of arguing from different points of view. In urban planning, friction evokes a moment in which you suddenly see yourself and the city from a different perspective. To me, the success of a public space lies precisely in the degree to which the space allows the user to reflect on why it has value or lacks value – an evaluation that is prompted by friction.'*

Furthermore, Eliasson argues that artworks and things that create frictions are entangled in relations with people, things and environments. Through these frictional interactions, these things can change the world together with the users of urban space (Eliasson, 2009, p.149). Eliasson's artwork 'Erosion' and his reflections on the potential of friction to prompt people to see the city from another perspective (and potentially change the world) made me curious. With an educational background in perception psychology, I wanted to understand whether and how the action of jumping over a puddle can stimulate a change in an individual's perception of urban space. How could an installation that creates a friction contribute to the development of a person's perceptual abilities and illuminate an overlooked aspect of urban space? And how could such frictions be integrated in the design of everyday urban environments?

To address these questions, I looked to the ecological approach to visual perception, which was introduced by psychologist James Gibson in 1979. According to Gibson (1986[1979]), perception happens in multisensory interactions with the environment, and, therefore, the individual and the environment can never be understood separately. Gibson argues that individuals do not perceive objects in space, rather, they perceive possibilities for action. Returning to 'Erosion', a puddle is perceived as a possibility for jumping. The perceived action possibility is termed an affordance. Affordances are perceived in relation to the individual's physical abilities and current needs (Ibid.). This means that the same environment and object can afford different things to different individuals. For instance, the puddle for a child might afford walking through to splash the water or bending down to touch the water.

Through infancy onward we learn and are taught to perceive (and act upon) some affordances, and not others. This is why most adults would jump over a puddle and (probably) advise a child to do the same. This is referred to as canonical affordances (Costall, 1995; 2012). In other words, people learn to associate an object with one canonical affordance. This is the object's use meaning that is accepted by most people in a society. Canonical affordances lead to behavioral habits, and perceptions of objects with canonical affordances are difficult to challenge. Canonical affordances are in part strengthened by the design of objects, which often seek to perfect the object's association to its use meaning – for instance, the design of a door handle that always affords to (only) grab and open the door (Norman, 2013). In these cases, the concept of affordances is applied to design in order to strategically control the perceived possibilities for interaction with the object or environment (Ibid.; Rietveld, 2016).

The concept of canonical affordances can explain why most guests to the exhibition jumped over 'Erosion'. To explore how this jump (friction) might stimulate a person to see the urban space from a new perspective, it is relevant to look at the difference between the field and the landscape of affordances. The field of affordances refers to all of the perceived affordances that people interact with in an environment. The landscape of affordances, on the other hand, refers to all the other existing (but not perceived) affordances in an environment (Rietveld & Kiverstein, 2014). Recent research in ecological psychology shows that the field of affordances is created by the socio-cultural situation. Each situation (also referred to as behavior setting) has a shared regime of attention, which aligns people's perception of affordances in an environment (Heft, 2008; Rietveld & Kiverstein, 2014). Research also shows that design can both strengthen and challenge the shared regime of attention. The shared regime of attention is strengthened by design that enhances the solicitation of the affordances contributing to situationally appropriate behavior (Withagen, Araujo & Poel, 2017). And the shared regime of attention is challenged by a design that introduces ambiguous objects without canonical affordances that create slight discomfort and demand continuous re-adaptation to the environment (Rietveld, 2016).



Returning back to ‘Erosion’, it might be possible to argue that the puddle challenged the shared regime of attention at the entrance to the exhibition by creating a slight discomfort. People had to jump into the exhibition to avoid getting their feet wet. At all other times, people would most likely quietly and comfortably walk in through the door in accordance with the socio-cultural situation of an art biennale context. In this way, one could say that the friction briefly shifted attention and showed the art biennale from a different perspective. However, the installation itself added a canonical affordance to the environment (a puddle affords jumping over) and it might therefore not have been successful in exposing the landscape of affordances and stimulating a continuous exploration of the environment.

According to ecological psychology, a continuous exploration of the environment is important to develop one’s perceptual skills and learn new actions. Through such explorative behavior, people can perceive new affordances in familiar environments and challenge habits. Most of this research is focused on children’s learning in institutional settings (e.g. Bang, 2008) or the training of professional skills (e.g. Rietveld & Kiverstein, 2014). One exception is the theoretical analysis of how art and architecture can develop the perceptual skills of adults in everyday environments by ecological psychologist Reuben Baron (2008). According to Baron, spaces that are designed without canonical affordances and that continuously bring the users’ bodies out of balance (e.g. through tilted floors) have a tentative quality. Such tentative spaces activate people’s body and senses and stimulate a continuous re-interpretation of the environment that challenges habitual behavior. As Baron (2008, p. 340) summarizes:

*‘Getting the most out of our environment means more than re-educating the senses. It also means becoming open to new emotional experiences and reawakening in the participant a sense of playfulness that may have been dulled by daily habits and adult responsibilities.’*

Returning to ‘Erosion’ with this new perspective, the friction that the puddle created could be understood as a tentative urban space that activated people’s bodies and challenged habitual behavior. However, because it had a canonical affordance, it did not stimulate people to explore the surrounding environment. So, I reasoned, an architectural installation that creates a tentative (urban) space without canonical affordances could induce a shift in attention from the field to the landscape of affordances and, thus, stimulate a continuous exploration of the surroundings. This change in perception, I figured, could catalyze a change of our behavioral habits (and, potentially, change the world). In this way, urban and architectural design has the potential to stimulate the development of new perceptual skills and support the rediscovery of everyday (urban) landscapes. I decided to explore this potential in my research project. My second source of inspiration offered me more insight into the potential of architecture to activate a person’s body and senses.

## EMPOWERMENT OF AESTHETICS AND ATMOSPHERE

In 2014, the landscape architect, Stig Lennart Andersson, curated the Danish pavilion at the International Architecture Exhibition of the Venice

Biennale. In the pavilion, guests were invited to feel the color white, to touch bark, to smell the root of a tree, to walk on and hear the sound of pine needles. It was a pavilion of multisensory interactions.



Andersson entitled the exhibition ‘Empowerment of Aesthetics’ and argued that it is such multisensory and affective interactions that define architectural aesthetics and their potential to influence the future (Andersson, 2014, p. 49, 16)

*‘Aesthetics is not how things look. It is not about images. Aesthetics is all the sensory feelings of humans: All our senses and all our emotions. (...) Empowerment of aesthetics is just that: The belief that our senses and our feelings should play a complementary role to the rational in determining how we want our world to be in the future. (...) We must rediscover our belief in the power of aesthetics as equally important to the rational when we determine how we want our world to be in the future.’*

Furthermore, Andersson identifies this aesthetic in nature and argues that architectural aesthetics can create a better world by embracing the complementarity of the built and natural environments (Andersson, 2014). For my research project, I was particularly inspired by Andersson’s correlation between multisensory interactions and architectural aesthetics. Multisensory interactions, following my exploration of friction and affordances, have the potential to stimulate a person to perceive and explore new affordances. Could architectural aesthetics, then, be understood as a catalyst of such explorative behavior? Moreover, Andersson’s argument that such aesthetics have the potential to help us determine the future of our world led me to reflect on the potential impact of explorative behavior. Can such behavior lead to new insights beyond the newly perceived affordances? To address my questions, I looked to the theory of atmosphere.

The theory of atmosphere is also a theory of perception that focuses on multisensory interactions. It was first developed by the philosopher Gernot Böhme (1993) to describe aesthetics as aisthesis – that is to say, the multisensory perception of the environment. Although Andersson does not refer to Böhme in his description of ‘Empowerment of Aesthetics’, he does refer to the concept of atmosphere (Andersson, 2014, p. 51) and his definition of aesthetics follows the theory of atmosphere. According to Böhme, perception occurs through the atmosphere. The atmosphere is the multisensory and affective quasi-object in-between people and things that tinctures a space and all the people and things within it with a particular mood, rhythm and character (Böhme, 1993). But atmosphere is also a term referring to the air around the Earth in natural science and to the invisible political structures of space and affect in social science (Latour, 2003). Following this logic, the concept of atmosphere encompasses the multisensory and affective interactions between an individual and the surrounding environment, the physical components and quality of the air, and the invisible political and organizational aspects of space (Andersson, 2014; Latour, 2003; Borch, 2014b; Roquet, 2016).

Furthermore, atmosphere is not only related to aesthetics that are designed by architects. Atmospheres are also staged in public space by different agents with commercial, political or other agendas (Borch, 2014b; Thibaud, 2015; Roquet, 2016). By staging atmospheres, the agents influence people’s behavior (different moods lead to different actions). And because atmospheres are most often unconsciously perceived (Böhme, 1993; Thibaud, 2015), people are influenced to see their surroundings through a particular atmosphere without awareness. As Olafur Eliasson (In Bohme, borch, eliasson & pallasmaa, 2014, p. 95) points out:

*‘When we speak about normativity and atmospheres, I think it is important to note that we are often numb to the atmospheres that surround us. Here, architectural detail and artistic intervention can make people more aware of an already existing atmosphere. That is, materiality can actually make atmospheres explicit – it can draw your attention and amplify your sensitivity to a particular atmosphere. All materials have psychosocial content, and the right material can make the atmosphere apparent by giving it a trajectory, by making it almost tangible. Yet it could also go another way: the materiality of something has the capacity to work in a non-normative or liberating manner, opening up new ways of engaging with the atmosphere.’*

Returning to the exhibition ‘Empowerment of Aesthetics’, I wondered whether and how touching bark, walking on pine needles and smelling the root of a tree could draw people’s attention to the atmosphere around them. Possibly such materials activated people’s bodies and senses and stimulated a shift in attention, just like the tentative space created by ‘Erosion’. If this was the case, then architectural aesthetics could disrupt a shared regime of attention and make explicit *both* the surrounding atmosphere and landscape of affordances. Furthermore, it would imply that the subconsciously perceived atmosphere

is an environmental factor that maintains the field of affordances. Here, I recognized an interesting research potential in combining the idea of friction with architectural aesthetics and, more conceptually, the theories of affordances and atmosphere. This theoretical link has not been explored as yet, so I decided to pursue it in my research project.

Exploring this link could, aside from contributing with new theoretical knowledge and a deeper understanding of the empowering role of aesthetics, also contribute to the growing interest in the atmospheric approach in art and architecture. In the past few decades, atmosphere has been increasingly explored by architects, most notably by Peter Zumthor (2006) and Juhani Pallasmaa (2014). Both Zumthor and Pallasmaa argue for the importance of affective and multisensory interactions with architecture and, especially, materiality and the sense of touch. Recent architectural developments have moved towards a meteorological approach to atmosphere. For instance, the Jade Eco Park by Philippe Rahm Architects in Taiwan is designed with invisible pathways and pavilions created by currents and islands of cool and hot air. These invisible pathways are based on underground constructions leading water through the landscape and visible constructions that direct wind flow (Garcia, 2014). Users are led not by their eyes, but by their sense of coolness and heat, humidity and smell. Another example is the Blur Building by Diller Scofidio + Renfo for the Swiss Expo 2010 (Harrison, 2013; Smailbegovic, 2015). Installed in the Neuchatel lake, the building consists of a circular steel construction lifted off the water on pillars. The steel construction sucks water up from the lake and, through nozzles on the outer sides of the steel structure, drizzles the water back into the surroundings as a mist. The result is an experience of the building as a cloud on the lake (Ibid.).



Such architectural experiments with atmosphere are, however, criticized for creating environments that invoke a specific feeling or sensation, rather than awakening the user's own body, senses and criticality. For instance, Hal Foster (2013, p. 91) criticizes the work of, among others, Phillippe Rahm Architects:

*'In the guise of activating us, some of this work in fact subdues, for the more it opts for special effects, the less it engages us as active viewers. In this way the phenomenological reflectivity of 'seeing oneself see' approaches its opposite: a space (an installation, a building) that seems to do the perceiving for us.'*

I was curious whether I could overcome this critique by linking friction with architectural aesthetics, and affordances with atmosphere. Returning to 'Empowerment of Aesthetics' with this knowledge, it seemed that the potential of aesthetics to stimulate explorative behavior lies not simply in the multisensory interactions with bark, pine needles and tree roots. Rather, I reasoned, the empowering role of aesthetics could be found in the capacity of such materials to draw attention to the existing, overlooked atmosphere. Following this line of thought, my research project would explore how architectural aesthetics could stimulate the exploration of atmospheres and affordances that already exist but escape our attention in the everyday. My third and last source of inspiration contextualized this research aim.

#### ISSUE OF INSENSITIVITY AND THE ANTHROPOCENE

Throughout his research, philosopher and sociologist Bruno Latour has argued for the entanglement of humans and non-humans. People and things such as political regulations, paperclips, atmospheric phenomena and animals (to name just a few examples) are entangled in complex networks. The action of one actant in this network (be it a paperclip or a person) has an impact on all other actants in the network. This is summarized in the Actor-Network Theory (or ANT) (Latour, 2007). Everything is connected but, he argues, these connections are invisible and most often unfelt in our everyday lives. The climate crisis is an urgent reminder of these interconnections. Local actions have consequences on global ecosystems at an unprecedented scale. Yet we remain insensitive to our connectedness. As Latour summarizes (2016, p. 315, 319):

*'To approach the ancient philosophy of common sense – the sensus communis – we might begin at the beginning, by asking: How do we make ourselves actually sensitive? In particular, how do we make ourselves sensitive to one specific character, an unusual character that has become increasingly important: Gaia? This character brings together a strange mixture of science, religion, law, and politics. (...) If we remember the etymological sense of an aesthetic as making sensitive, how does a specific medium render us sensitive to things as they come to us? Things can come to you, but if you don't render yourself sensitive to them, you just don't get it.'*

This was an interesting and inspiring perspective for my research project. Latour's definition of aesthetics follows that of the 'Empowerment of Aesthetics' exhibition and atmosphere theory. Furthermore, he argues that this aesthetic can make people sensitive to global issues by taking into account the everyday experience of being (Latour, 2016, p. 317). I wondered if an installation that applied aesthetics to draw attention to the atmosphere in an overlooked urban environment could have this impact? And, if so, could this point to an unexplored potential of architectural aesthetics? In response to the climate crisis, most of architectural research and practice has worked towards minimizing the use of materials. But could architecture also address the climate crisis by sensitizing people to their entangled surroundings? I decided to explore this further.

Latour's research on insensitivity to the climate crisis falls within the wider category of research on the Anthropocene and New Materialism. The Anthropocene is a term to describe the current geological epoch that is characterized by the impact of human activity on environmental processes. The entanglement between human activity and the environment is the subject matter of research on the Anthropocene. Architectural research on this topic often refers to New Materialism theories to address this entanglement. New Materialism theories focus on the interactions between humans and nonhumans, just like the theory of affordances and atmosphere. But here, the focus is often on the non-human – for instance, the agency of designed things (Latour & Yaneva, 2008; Sørensen, 2016 [2016]; Yaneva & Mommersteeg, 2019). These theories argue that the design of things is not finalized by the architect – it is completed in the interactions with users. Likewise, people are not understood as fixed beings that act in predictable ways. Rather, they are understood as continuously becoming in their interactions with the architecture (Harrison, 2013; Grosz, 2017).

Following the New Materialism line of thinking, perceptual changes can be understood as continuously occurring in people's interactions with architecture. The question is not *if* they occur, but when, where and to what degree they occur. According to New Materialism philosopher Elisabeth Grosz (Grosz, 2017; Grosz, Davis & Turpin, 2013), architecture has the potential to create aesthetic experiences that enable new forms of subjectivity and social engagement to emerge. However, Grosz argues, architecture tends to function as a commodity that is cheap and appealing to buyers. Whereas the first side of architecture can be understood as being focused on stimulating a new sensitivity, the latter cannot.

Looking for perspectives on how architectural aesthetics can enable a sensitivity towards the Anthropocene entanglement, I found three theoretical analyses to be of particular interest for my research. First, Aida Smailbegovic (2015) identifies the potential of the Blur Building (discussed earlier) to sharpen our senses and generate a new sensitivity towards the minute changes of the environment. She argues that the Blur Building may develop our perceptual abilities and language by inviting people to focus on and describe the minute changes in the cloud formation that would, in a different context, escape our attention. Furthermore, the shifting edges of the Blur Building dissolve the hardness and fixity of a human-

built architectural object and indicate that such structures are in continuous interaction with the surroundings and open to an indeterminate set of futures.

Second, the Pittsburgh Reconstruction, a conceptual design experiment by David Gissen, recreates the smoky air that hovered over the industrial city in the past. Set against the present-day Pittsburgh, this visualization allows one to imagine the smog- and carbon-saturated atmosphere that once existed, and relate it to the air of today (Gissen, 2012). Gissen argues that it is important for architecture to address other, less comfortable, aspects of nature to make people sensitive to the entanglements of the Anthropocene (Gissen, 2009). Interacting with smog, in this sense, might be just as important as observing a cloud or smelling the root of a tree.



Offering a third perspective, Amanda Boetzkes (2015) argues that artists contribute to a particular calibration of the perceptual system that can either hinder or promote the perception of specific affordances. In reference to Gibson's argument that an individual only perceives a small array of existing affordances at any given moment (the field of affordances discussed earlier), Boetzkes argues that artists contribute to framing what affordances are perceived in the environment. She terms this ecologicity. Boetzkes urges artists to be conscious of the ecologicity that they contribute to – that is to say, artists should reflect upon which affordances they bring into awareness through artistic framing.

These three perspectives and the concept of Anthropocene proposed an alternative reading of the theories of affordances and atmosphere. Affordances, here, are discussed in relation to the global scale, exposing which landscapes of affordances can contribute to climate-conscious actions. The understanding of atmosphere is expanded to include overlooked aspects, such as smog. Furthermore, becoming aware of the atmosphere might have a value in itself in the Anthropocene epoch, as it can sharpen people's senses to perceive the barely noticeable fluctuations of climate change. Finally, the New Materialism approach of understanding a designed thing through its interactions with humans and non-humans shifts focus in a design process of an architectural installation. It is not the installation as an artifact that is interesting, but the processes of its becoming in its interactions with people and things.

In relation to my research project, the issue of insensitivity and concept of Anthropocene inspired me to nuance the focus. I was still interested in exploring the potential of architectural aesthetics to draw people's attention to the atmosphere and the landscape of affordances. But I was now also interested in registering the agency of such an installation – that is to say, the process of its becoming in interactions with regulations, climate and other things in the complex Anthropocene network. Furthermore, I was interested in drawing people's attention to an atmosphere that was contested and overlooked in the everyday. I was curious to discover what landscape of affordances could be exposed on such a contested site. I wondered whether sharpening people's sensitivity and exposing overlooked landscapes of affordances could, in light of the climate crisis, lead to increased agency by stimulating people to consciously perceive and act on the world and adjust old habits, rather than passively react to environmental changes. It is with these thoughts that I arrived at the topic of my research project – architectural aesthetics as a catalyst of agency.

#### CRITICAL SPATIAL PRACTICE AND AGENCY

My exploration of architectural aesthetics as a catalyst of agency is, as indicated by my three sources of

inspiration, based on the linking of the concepts, atmosphere and Anthropocene in the design process of an architectural installation. This exploration follows the method of research through design. Research through design is a method for exploring a topic by documenting and reflecting on a design process as it occurs (Dunin-Woyseth & Nilsson, 2012). This allows one to develop new knowledge during the abductive thinking of designing an artifact and articulate the designerly ways of knowing that often remain tacit (Cross, 2007). It also allows one to follow the process of the becoming of an installation in its interactions with different people and things, rather than simply evaluating a 'finished' design artifact. For my research project, this method is particularly interesting because it allows me to develop and test the effect of an installation that is based on the three concepts that have, as yet, not been linked. Because the concepts have currently not been linked, there are also no architectural precedents that are specifically based on this theoretical connection. Therefore, to test whether and how architectural aesthetics can draw attention to the overlooked atmosphere and landscape of affordances, it is necessary to first design such an installation.

Furthermore, research through design is a relevant method for my research project because it allows me to experiment with using and developing theory through design. By integrating perception theories directly into my design process, and using the design process to further develop the proposed theoretical link, I can contribute with new knowledge to the field. In design research and practice, psychological and philosophical theories are most often used to understand the user, site or designed object (e.g. Frascara, 2002; Costall & Dreier, 2016 [2006]). My research through design process, on the other hand, engages the useful aspect of theory. Using theory in design, according to Jane Rendell (2006), does not mean an application of theory or the theory as a design

tool. Rather, it is an exploration of how theory may open new trajectories for practice, and vice versa. Such an approach has the potential to transform both theory and practice. Rendell describes this as engaging with a diagonal axis between theory and practice and between disciplines (Ibid., p. 11):

*'Engaging with this diagonal axis demands that we call into question what we normally take for granted, that we question our methodologies, the ways we do things, and our terminologies, what we call what we do.'*

Accordingly, my research through design process challenges the status quo of both the social science method of conceptual analysis and the architectural design process, and contributes with new knowledge to both fields. My approach in the research project is interdisciplinary, drawing on perception psychology and philosophy, art and architecture. This interdisciplinary approach to design can be understood as a critical spatial practice. Critical spatial practice is a term coined by Jane Rendell (2006). This term allows us to look beyond the common separation of architecture as restricted by function and art as being a free subjective expression and, instead, focus on the critical aspect of both fields. Critical, in this case, refers to modes of thought that are reflective and seek to stimulate people's agency by providing a critique of normative attitudes. By being critical, one can not only describe the present conditions, but also imagine something different and transform the present. According to Rendell (2006, p. 6), critical spatial practice allows us to *'discuss work that transgresses the limits of art and architecture and engages with both the social and the aesthetic, the public and the private.'*

The aim of my research through design process is an installation that shifts people's attention from the shared regime of attention and stimulates an exploration of the overlooked atmosphere and affordances. In this way the installation critiques the normative attitudes (of attention) in public space, transforms the present by exposing other action possibilities and, thereby, stimulates people's agency. By focusing on the transformative potential of multisensory interactions – i.e. the aesthetic – my installation engages with both social interactions, the public space and people's private attention. Following this understanding, my research project can contribute with new knowledge to critical spatial practice and to the growing field of architecture that stimulates human agency (Hill, 2003; Harrison, 2013; Awan, Schneider & Till, 2011; Bryant, Rodgers & Wigfall, 2018).

Architecture that stimulates human agency can be understood as designing for an active and creative user that develops the building through interpretations and actions (Hill, 2003). The building is not finished when it is designed and built by the architect, it continues to develop in interactions with the users. This understanding is opposed to the more traditional approach of a passive user that consumes the building as envisioned by the architect. An architectural strategy for stimulating human agency is, for instance, polyvalence. Polyvalence is understood as a form without a fixed meaning that can be continuously reinterpreted anew with each new user (Ibid.). For example, the playgrounds

of Aldo Van Eyck (Withagen & Caljouw, 2017) and the recent 'End of Sitting' project by RAAAF where an office landscape was created from ambiguous rock-like objects that could be interpreted as either chairs, tables or lounge furniture (Rietveld, 2016). To use a term discussed earlier in this introduction, polyvalence can be understood as objects without canonical affordances. Other design strategies to stimulate agency include incompleteness, hedonistic modernism, form against function and doing it yourself (Hill, 2003). In all these strategies, the user contributes to defining either the spatial design and structure, or its program and function. However, in all these strategies the focus is on how a creative user may develop the architectural object, rather than on how the architectural object may develop the perceptual abilities and sensitivity of a (creative) user. This is where my research project can offer a new perspective.

In my research through design process, I explore design strategies that can create a shift of attention to stimulate people's perception and expose the overlooked aspects of the environment. This approach to design can be understood with the concept of 'architectural body' (Harrison, 2013). Architectural body refers to architecture as a prosthesis; that is to say, the architectural object is understood as a continuation of the body of the user. Accordingly, the building becomes a new prosthesis for each individual user (and his/her body). In these approaches, the user is seen as a hybrid, posthuman subject that is inseparable from its technologically designed environment. As Harrison (2013, p. 11) notes:

*'If, in phenomenological terms, space could be considered an environment that is activated through the perception of its subjects, then the use of technology to stimulate the senses would theoretically heighten this effect: it would awaken the body and catalyze new modes of inhabitation.'*

As examples of such projects, Harrison (2013) offers the concept of oblique surfaces by Architecture Principe and the perforated floors in buildings by Arakawa & Gins (also analyzed by Reuben Baron, who was mentioned earlier). Claude Parent of Architecture Principe believed that by bringing people out of balance, architecture could bring about self-directed change, while Arakawa & Gins argued that by continuously activating the body and mind of inhabitants, architecture could prolong people's life (Ibid.). Here, the focus is not on completing a design or program of a building. Rather, the focus is on challenging the body and the user. In this approach, architecture takes on a more active role in stimulating human agency by supporting the development of new bodily abilities. My research project seeks to contribute to this design approach with specific knowledge on the role of architectural aesthetics.

#### ARCHITECTURAL AESTHETICS AND ONTOETHICS

An exploration of how architectural aesthetics may stimulate agency touches upon the ethics of architecture and the ethics-aesthetics debate in architecture. The ethics of architecture discusses the impact that architecture has on people and the world. Most

commonly, architectural research links ethics to function (e.g. Harries, 1984). Furthermore, ethics are often understood as the serving of a common goal, reduction in cost and environmental impact, and bringing forth of a functionality that is practical for large and growing populations (Grosz, Davis & Turpin, 2013). Following this line of thought, the role of aesthetics is either seen as an expression of the functionality (Harries, 1984), as expressing the values and morals of society (Pløger, 2002), or as unrelated to ethics altogether and expressing solely the artistic qualities (Treib, 2018).

The ethics of architecture, in this research, is focused on evaluating how architectural objects create organizational structures and express values that affect people's behavior and beliefs. Accordingly, both ethics and aesthetics are understood as being embedded in the architectural object. In contrast to this, the emerging approach to architecture in the Anthropocene, which is based on New Materialism theories, addresses ethics and aesthetics in relation to the interactions between the architectural object and user. That is to say, aesthetics and ethics are embedded in the interactions of the architectural object and its users, and how such interactions lead to the development of new subjectivities. Here, ethics are approached as innovative and open-ended experimentations in architectural engineering, construction and aesthetics (Grosz, 2017; Grosz, Davis & Turpin, 2013). Whereas the first approach to ethics is connected to morality and focuses on being in the world (how architecture is and can reduce its current impact), this approach to ethics is connected to politics and focuses on the processes of becoming in the world (how architecture and its human and non-human users can continuously develop).

This becoming-oriented approach to ethics can be considered an 'ontoethics' – a concept developed by Elizabeth Grosz and inspired by the understanding of ethics developed by philosophers Giles Deleuze and Felix Guattari. Ontoethics addresses the extent to which a body's potential is developed or diminished in interactions with architecture and the environment. As Grosz explains (2017, p. 153 – 154):

*'This is an ethics that affirms what a body can do, what a concept/prospect/affect can do, what degrees of power, that is, what degrees of movement and rest, intensify or diminish the capacities of a life. (...) Ethics assesses the enhancement or diminution of the body's powers of acting and thinking.'*

Aesthetics is closely linked to ethics in this understanding. Aesthetics is seen as a way to intensify a person's immersion in the world. It is through aesthetic immersion that human capabilities to act, know and perceive may be enhanced (Grosz, 2017, p. 157). This can be understood as stimulating ontogeny; that is to say, the process of individual development in interactions with the surroundings. Following this understanding, an ontoethics evaluates the interactions between an artistic object and people or things, and assesses the capacity of architectural aesthetics to stimulate the ontogeny of both human and non-human agents (Grosz, 2017). To reflect on architectural aesthetics and ontogeny, researchers

and architects must follow these interactions and document the processes of becoming. In this way, a new discourse of architectural aesthetics might emerge (Yaneva & Mommersteeg, 2019).

Returning to my research project, ontoethics and the understanding of aesthetics in relation to ontogeny is highly relevant for the assessment of my installation. The aim of my research through design process is to design an installation that, through architectural aesthetics, activates people's bodies and senses to expand their perceptual field. In other words, my aim is to enhance the body's powers to act and think. Consequently, it is an ontoethics approach to architectural aesthetics. And, in accordance to this approach, I evaluate how and whether my installation stimulates ontogeny. I do this in two evaluations. First, I document my design process and, thus, reflect on the becoming of the installation through interactions with different things and people that were part of this process. Second, when the installation is realized, I analyze the effect it has on people's perception and actions by documenting the change in perceived affordances and atmosphere. I achieve this by observing people's interactions and registering the perceived affordances and atmosphere on site during and after the installation. Through these two evaluations I arrive at new knowledge about the ontoethics of architectural aesthetics. In summary, my research project is outlined with the following research focus and questions.

RESEARCH FOCUS AND QUESTIONS	With the specific point of departure in the ecological theory of perception and a focus on the atmospheric approach in architecture, the overarching research focus of this PhD project is to develop an understanding of how architectural aesthetics can catalyze agency. Within this research focus, the following sub-questions will be addressed:
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- (1) What is the relation between the atmosphere and the perception of affordances? Hereunder, can becoming aware of the atmosphere stimulate the exploration and perception of new affordances?
- (2) How can the concepts of affordances, atmosphere and Anthropocene inform and drive an architectural design process? Hereunder, how can a theoretical link between the three concepts be expressed through an installation?
- (3) How can a design process contribute to a conceptual analysis of affordances, atmosphere and Anthropocene? Hereunder, how can a design process lead to the theoretical development of the ecological approach to visual perception and theory of atmosphere?
- (4) How can a design process that explores the concepts of affordances, atmosphere and Anthropocene contribute to critical spatial practice? Hereunder, how does this contribute to the ethics-aesthetics discourse in architecture?

## THESIS STRUCTURE

This research focus is unfolded in the next four chapters. In chapter two, I outline the theoretical starting point of my research through design process. I do this by discussing the concepts of atmosphere, affordances and Anthropocene, and how they opened trajectories for my design exploration. Following this, in chapter three, I introduce and map my interdisciplinary research through design process. In particular, I discuss my use of theory in a conceptually driven research through design process and present my design tactics. Then, in chapter four, I describe and reflect on my research through design process. This is the core of my research project and the longest chapter of this thesis. The chapter is subdivided into the five parts of my research through design process. Finally, in chapter five, I return to and address my research questions with knowledge gained from the design process and, thus, conclude this research project. I close this thesis with an afterword, introducing the beginning of my research idea and offering an alternative perspectivation of my results.

The book design, developed in collaboration with graphic designer Jacob Grønbech Jensen, strives to express one of my conclusions – that aesthetic features can stimulate explorative behavior by enhancing the expression of the action most definitive of an atmosphere. I reasoned that the most defining action, while reading this thesis, is the flipping of pages. Consequently, Jacob Grønbech Jensen designed a print for the book's edge that accentuates this action. As an afterthought, I wonder if this might lead to the discovery of new potentials of this thesis?

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## THEORETICAL STARTING POINT

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*'I trained and worked first as an architect and practitioner and later as a historian and theorist. This influences the place I occupy between theory and practice. I say this because although I started out chronologically as a practitioner, for me the relationship between the two 'starts' with theory. Reading critical theory is what opened up my world and allowed me to see things differently. Theoretical debates changed the ways in which I understood architectural practice, expanding my expectations of what architecture could do'.*

In the opening quote, Jane Rendell (2006, p. 8- 9) reflects on theory in relation to architectural practice. For Rendell, theory is the start of an architectural practice because it may expand what one sees in the world and the expectations that one has towards architectural practice and its potential. In the same way, theory is also the beginning of my PhD project and the research through design exploration of architectural aesthetics and agency. The theoretical concepts introduced in the previous chapter opened my eyes to new potentials of architectural design and, in so doing, initiated my research through design experimentation. This chapter is an elaboration and discussion of these concepts and theories and how they expand the potential of design. I do not wish, however, to give an exhaustive discussion and contextualization of each theory. Rather, my aim is to highlight the aspects of the theories that are useful for my design exploration. In this way, this chapter is the theoretical starting point of my research through design process.

Rendell's approach to theory and practice is inspired by Gilles Deleuze's understanding of *using* theory. Deleuze argues that instead of seeing practice as an application of theory or an inspiration for theory, practice and theory can be understood as being in continuous relays. When practice is used in theory and theory is used in practice, they have the potential to develop and transform one another. As Rendell elaborates, theory can suggest paths into practice. And, by following these paths, practice can, in turn, develop theory (Rendell, 2006). This approach to theory follows the pragmatist philosophy of, for instance, John Dewey and William James (Brinkmann, 2007). According to pragmatism, to know something is to be able to do and transform something. Knowledge cannot be understood as a representation of the world. Rather, knowledge and theory is something active that continuously transforms and is



transformed by its interactions with the world. Following this understanding of knowledge, theoretical concepts and ‘tools’ do not dictate how to be used – they are open to interpretation by competent practitioners (Ibid.). And it is in these interpretations by practitioners that the concepts are again transformed.

In my PhD research, I am specifically interested in the three theoretical concepts of affordances, atmosphere and Anthropocene. As discussed in the previous chapter, exploring the interrelation between these concepts is relevant to developing an understanding of architectural aesthetics as a catalyst of agency. Furthermore, these concepts changed the ways in which I understood architectural practice and expanded my expectations of what architecture could do. In this chapter, I unfold and discuss each concept and its relation to architectural design. I begin by introducing the concept of Anthropocene as it offers a filter through which to discuss both the concepts of atmosphere and affordances. I conclude this chapter by sketching out a propaedeutic link between the three concepts and addressing how it is further explored in my research through design process.

#### ANTHROPOCENE

The Anthropocene is a concept from geology (stratigraphy) to describe the current geological epoch. This epoch is defined by the massive effect that human activity has on ecosystems on a global scale. Human activity is currently the largest force affecting ecosystems. These effects lead to imbalances in the Earth’s systems, giving rise to issues such as climate change, deforestation and loss of biodiversity. Although the starting point of the Anthropocene epoch has not been decided upon, the massive effects of human activity have been traced back to the second half of the 20th century, referred to as the Great Acceleration (Davis & Turpin, 2015). The main concern raised by research on the Anthropocene epoch regards the uncertain future of our planet – if human activity continues its current effect on global Earth systems, the consequences will change our lives and planet as we know it today. As biologist Christian Schwägerl (2016, p. 166, 169) points out:

*‘The Anthropocene is not an abstraction; it is woven into the everyday life of every human being—and every future human being. That is why it is more important than ever to be sensitive to the ways in which our own actions (and inactions) interact with the earth system. (...) If Anthropocene thinking promotes the insight that there is no out in just throwing it out and that our well-being as humans is inextricably interwoven with the well-being of animals and plants, that would be significant progress.’*

Moving beyond geology and natural sciences, this Anthropocene thinking has already had a significant impact on architectural and artistic discourse. This impact is particularly evident in a re-conceptualization of the relation between nature and culture and the identification of new perceptual and aesthetic issues (Turpin, 2013; Davis & Turpin, 2015). In Western artistic discourse and social

science, nature and culture have traditionally been understood as distinct from each other. Furthermore, culture was often seen as ‘more advanced’ than nature (Schwägerl, 2016; Davis & Turpin, 2015). In architecture, nature was considered as something to extract (a resource for construction) and control (Gissen, 2009). The role of architecture has been to protect humans from the undesirable parts of nature (cold, rain) and showcase the desirable aspects (sunlight, sea views). In the confines of a comfortable, controlled indoor environment, architecture provided people with an opportunity to enjoy curated vistas of nature. The concept of the Anthropocene changed this understanding, stressing that all nature has at some point been influenced by human activity. Acknowledging that nature and culture cannot be separated, architects are exploring other ways of working with the environment (Gissen, 2009; Prominski, 2014; Harrison, 2013, 2019).

One approach to this has been proposed by architect David Gissen with the concept of ‘subnatures’. Subnatures refer to the elements of nature that have been ignored and historically disregarded, but that are completely intertwined with human life. Examples of this are dust, pests (e.g. pigeons and rats) and pollution. Gissen argues that subnatures can draw attention to overlooked aspects of our environment and highlight the ways in which human activity shapes nature. Gissen (2009, p. 212-213) elaborates:

*‘Unlike more normative forms of nature, subnatures are not a means for making existing buildings and cities into better functional wholes; they are critical instruments for examining how our notions of the environment either support or undermine existing experiences of architecture and urbanism. Subnatures enable us to better understand our environment as a product of social and historical processes, as something tied to social history as much as natural history.’*

Closely related to this, atmosphere has also been identified as a concept of relevance for addressing the inseparability of nature and culture. This is due to pollution and the invisible social inequalities of air quality (Gissen, 2009; Adey, 2013) and the invisible data networks and interactions between non-human agents (Ash, 2013). By controlling atmosphere, designers and other agents also mediate people’s perception of nature. These mediated aspects of atmosphere are referred to by the term *ambiance*. Philosopher Timothy Morton (2007) argues for using the word *ambiance* instead of *environment* to refute the notion of a nature existing without human agency. Furthermore, the relevance of atmosphere is also linked to re-calibrating our senses and developing new perceptual abilities. As many scholars point out, we have become increasingly insensitive to our surroundings and the anthropogenic landscapes no longer have a shock value (Davis & Turpin, 2015). People must learn to decipher the barely noticeable environmental changes that are caused by their actions and become sensitized anew to their surroundings. To understand such atmospheric sensitivity, researchers draw inspiration from, for instance, how Inuit hunters notice the slow melting of ice (Boetzkes, 2015) or how the *Blur* building draws attention to the minute changes of air formations (Smailbegovic, 2015).

The perceptual issue of de-sensitization in the Anthropocene has been explored by philosopher Bruno Latour. Latour (2007; 2016) highlights that people have difficulties in perceiving how their actions affect the environment because people and things are so deeply intertwined in everyday life. A ‘thing’ like pollution cannot be observed as an object by a subject standing outside of it. Rather, the thing is continuously being created in and creating the interactions with people. Latour (2016) argues, however, that arts and architecture can develop people’s sensitivity to the environment. Latour urges artists to return to the etymology of ‘aesthetics’ and its original meaning of ‘making sensible’ – that is to say, to the theory of atmosphere. He suggests that artists can thereby explore how the entanglements of the world can be made felt and perceptible. By making these entanglements felt, he reasons, people might engage with the Anthropocene issues and change their habits.

Elaborating on this perceptual issue, Timothy Morton (2010) focuses on the non-human timeframe of things in the Anthropocene and coins the term ‘hyperobjects’. Hyperobjects refer to things that happen on a geological timeframe and go beyond a human lifecycle. For instance, plutonium will be around for longer than all recorded human history and, at the same time, radiation from plutonium enters people’s bodies and affects their life trajectories. The same is true for pollution and disruptions of climate. To address hyperobjects, people must think beyond the human-scale, something Morton terms ‘the ecological thought’. Although ecological thought is difficult to practice, it is also, as Morton (2010, p. 135) argues, already part of our future:

*‘How to care for the neighbor, the strange stranger, and the hyperobject, are the long-term problems posed by the ecological thought. The ecological thought can be highly unpleasant. But once you have started to think it, you can’t unthink it. We have started to think it. In the future, we will all be thinking the ecological thought. It’s irresistible, like true love.’*

The ecological thought, then, is also part of my reading of the concepts of atmosphere and affordances. Addressing hyperobjects and stimulating agency in the Anthropocene demands a perceptual shift away from the everyday human scale, an attention to subnatures, an increased sensitivity to the invisible atmosphere and a change of habitual behavior. It is here that the concepts of atmosphere and affordances can offer relevant design strategies.

#### ATMOSPHERE

The concept of atmosphere shifts the design focus from the object to the space in-between an object and a person. Atmosphere as a term is a metaphoric adaptation of the physical phenomenon of gasses surrounding a planet or a star (Bille, Bjerregaard & Sørensen, 2015). The prefix ‘atmo-’ refers to air and ‘in the round’ (Roquet, 2016). In this original meaning, the term atmosphere is closely related to the environment and climate. In its metaphoric understanding, atmosphere is the immediate affective interaction with and multisensory experience of a place (Ibid.; Bille, Bjerregaard & Sørensen, 2015). The concept

has contributed to a new definition of aesthetics and a critical understanding of the influence that air-design and air-politics have on human agency.

Atmosphere as a definition of aesthetics was introduced by philosopher Gernot Böhme in 1993. Böhme observed that the term atmosphere was both used in political and aesthetic discourse without a clear definition. He also observed that it was used in everyday language with a clear reference to the affective tone of a space or of nature. For instance, one can refer to a serene spring morning or one can be enveloped by a friendly atmosphere or met by a tense atmosphere when entering a room. Böhme argued that by elaborating on and defining ‘atmosphere’, it can become a concept that can account for the affects in-between people and their surroundings. Following, Böhme (1993, p. 114) defines atmosphere as a new aesthetics:

*‘The new resulting aesthetics is concerned with the relation between environmental qualities and human states. This ‘and’, this in-between, by means of which environmental qualities and states are related, is atmosphere.’*

Böhme’s definition of atmosphere as aesthetics has two significant implications for understanding architectural aesthetics. First, it marks the definite departure from the Kantian aesthetics which is more concerned with judgment and definition of an artwork within professional criticism or in relation to individual preferences than with multisensory perception. Furthermore, Kantian aesthetics rests on an ontological dualism between subject and object, whereas atmosphere surpasses the dualism by focusing on the relation between subject and object. Second, the focus on the relation between environmental qualities and human states expands the definition of art towards the production of atmospheres in all aesthetic work (including, for instance, advertising, stage design, interior decoration) and the perception of atmospheres in all settings (Böhme, 1993). This is radical because it expands the study of aesthetics beyond fine arts and museums to the everyday environments. Furthermore, it is radical because it places the perception of atmospheres before the perception of objects, shapes and colors (as is most common in perception research). Atmospheres, Böhme argues, are the filter through which objects, people and spaces are perceived. This perception is multisensory and often subconscious. Furthermore, Böhme argues that atmospheres can be (and have been) produced by different professionals of crafts when designing a space, an object or a person (e.g. actor) that radiates a presence; however, this knowledge on producing atmospheres is tacit and has remained unarticulated in artistic discourse.

By recognizing multisensory perception as the main concern of aesthetics, Böhme contributed to a shift in focus in aesthetics research and architecture from form and function to the experiencing human and the tacit knowledge of the crafts(wo)men (Borch, 2014a). Recent research on architectural aesthetics acknowledges the role of the body in design, explores the multisensory experience of everyday spaces and articulates the tacit knowledge of

architects (Bhatt, 2013). Although a focus on sensuous experience is not new in architecture (Borch, 2014a; Pallasmaa, 2014; Edensor & Sumartojo, 2015), more architects are explicitly working with the term ‘atmosphere’, and, thereby, contributing to its further development. For instance, Peter Zumthor and Stig L. Andersson have both attempted to articulate their tacit knowledge of working with atmosphere, and explored it in relation to light, sound and materiality (Zumthor, 2006; Andersson, 2014). Other architects, such as Philippe Rahm, Sean Lally and Diller Scofidio + Renfo, have explored the meteorological aspects of atmosphere, focusing on fog, heat, the movements of air and urban microclimates (Rahm, 2009; Roesler & Kobi, 2018). This marks a shift from a design of the visible towards the invisible qualities of space. As architect Philippe Rahm (Rahm, 2009, p. 32) elaborates:

*‘A slippage of the real from the visible towards the invisible is taking place, a shift of architecture towards the microscopic and the atmospheric, the biological and the meteorological. (...) It is no longer a case of building images and functions, but of opening climates and interpretations; working on space, on the air and its movements, on the phenomena of conduction, perspiration, convection as transitory, and fluctuating meteorological conditions that become the new paradigms of contemporary architecture. (...) Between the infinitely small of the biological and the infinitely large of the meteorological, architecture must build unlimited sensual exchanges between the body and space, the senses, the skin, breath, the climate, temperature, or variations in humidity and light.’*

Another strand of research on atmosphere has explored how the design of the invisible qualities of space affects human agency. Here, atmosphere is discussed as a way to govern behavior and explored as a political tool. This exploration, in both Western and Japanese philosophy and social science, is tied to the double meaning of atmosphere as both affective and climatic surroundings (Roquet, 2016). Furthermore, in this research atmosphere is often referred to as ‘ambiance’. Ambiance is a synonym of atmosphere referring to the overall tone or feeling of a place. However, ambiance emphasizes the mediating role of human sense perception on a person’s relationship to the surroundings. The prefix ‘ambi-’ means ‘to surround on both sides’ and therefore refers to a person or a thing being surrounded (whereas ‘atmo-’ does not have this reference). Ambiance implies a subjective and political element of mediation. That is to say, ambiance is produced by one or more agents in order to achieve a particular mood and relationship between people and the surroundings. In this way, ambiance dissolves the Cartesian idea of a preexisting environment that is unmediated and open for objective measurement (Ibid.). Furthermore, ambiance stresses the subjective quality of the environment and the role of human agency in the constructing of nature (Ibid.; Morton, 2007). In the words of philosopher Timothy Morton (2007, p. 33- 34):

*‘Ambiance denotes a sense of a circumambient, or surrounding, world. It suggests something material and physical, though somewhat intangible,*

*as if space itself had a material aspect. (...) I choose the word *ambiance* in part to make strange the idea of environment, which is all too often associated with a particular view of nature.’*

In this research, atmosphere becomes ambient. Focus is no longer just on the invisible qualities of space and on what we perceive affectively and sensuously, but also on the subjective mediation of the environment. This is particularly evident in the arguments of Japanese philosopher Watsuji Tetsuro (Roquet, 2016). Tetsuro identifies atmosphere/climate as weather, mood and social environment. Moreover, Watsuji argues that a person discovers him- or herself in interactions with the atmosphere. That is to say, self-understanding is rooted in an affective relation with the larger climate. Because all people of a nation share the larger climate, Watsuji further argues that social coherence and national identity is closely tied to the atmosphere. Watsuji’s philosophy was used by Japanese authorities to govern behavior and disguise power and authority as atmosphere and climatic phenomena. In Japanese society, attuning to the air of a place has been and continues to be a social imperative.

Furthermore, not being able to ‘read the air’ correctly is looked down upon and people who do not attune to the atmosphere are considered an annoyance (‘meiwaku’). In recent decades, however, atmosphere has been recognized as more than climate, and the social structures and power relations of atmosphere are becoming ever more revealed (Roquet, 2016). In this process, being ‘meiwaku’ can actually lead to increased agency. By disrupting a given ambiance and ‘misreading’ the air, an individual can critically reflect on the surrounding mood and, potentially, enter a different mood. As Roquet elaborates (2016, p. 15 – 16),

*‘In other words, we need to learn to read the air in a way that better recognizes the forces moving through it. (...) Every atmosphere includes a largely imperceptible border demarcating who can move seamlessly within it and who is made to feel uncomfortable, out of place, abject. Learning to trace out these transparent lines is a crucial part of making the air legible. (...) Instead of attempting to flee atmospheric influence, we might seek out new forms of agency via atmospheric mediation and think through the ethics of atmospheric design’.*

In Western philosophy this has been explored in the ethics of aesthetics of Felix Guittari (discussed in the previous chapter) and, more recently, by Peter Sloterdijk as biopolitics and Nigel Thrift as the spatial politics of affect. Thrift, following Guittari, argues that, because affect and senses are registered unconsciously, it is much easier for political and economic forces to affect people on this level (Wetherell, 2014). As a result, recent decades have seen an increased aestheticization of society where affective powers are strategically applied by artistic, political and business interests (Roquet, 2016; Borch, 2014b). This is considered an ambient subjectivation – that is to say, the making of a subject through impersonal aesthetics. Although it is impossible to escape ambient subjectivation in society, alternatives can be found by

exploring the aesthetics-ethics relation (Roquet, 2016). Furthermore, the turn towards aestheticization has been analyzed by philosopher Peter Sloterdijk as ‘air-design’ and the privatization of air. Air and atmosphere can no longer be considered as something neutral, but rather as a stage for bio-politics (Borch, 2014b). As Fischer (2007, p. 33) elaborates:

*‘But he [Sloterdijk] went on to read the atmospheric and climatic qualities not as an aesthetic metaphor, but as initial experiments of ‘air-design’. He identified ‘air’ as a relevant product of a future market society and predicted the end of communal atmosphere. For him, the design and commodification of ‘air’ follows from the history of privatisation of public services, common space, water, ground, etc.’*

The political influence of atmospheres on people’s actions has also been explored in social science and architectural research. Shopping centers and how their ambiance influences peoples’ behavior have been a primary target for analysis (Kazig, 2012), but also the production of atmospheres in urban spaces and private homes have been considered (Bille, 2015; Thibaud, 2015; Linnet, 2012; Edensor & Sumartojo, 2015). These analyses stress that people are not passive consumers of atmospheres. Designers, other authorities and also individuals in their private homes can stage elements that may lead to a particular mood and atmosphere. However, whether the atmosphere will actually be present depends on people’s actions and interactions. In this way, design of atmospheres does not have total power over individuals. Individuals are co-creators of atmospheres. And whether an atmosphere will persist depends on their actions. As sociologist Jean-Paul Thibaud (2015) argues, some urban spaces are more open, while others are more controlling. The decisive aspect is the extent to which a place intensifies or neutralizes the expressive power of social activities. Finally, it is important to highlight that although atmospheres are often used for commercial or political interests, they are also used to create a city that furthers multisensory interactions, well-being and inclusivity (Ibid.)

Although theoretical (especially philosophical) work with atmospheres and ambiance has addressed questions of agency and becoming critically aware of an ambiance, this has remained largely unexplored in empirical research. Empirical research on atmospheres and ambiance is predominantly interested in registering an atmosphere in a given place and analyzing how it is perceived and staged (e.g. Bille, 2015; Coelho, 2015; Linnet, 2012), or developing techniques to stage new atmospheres through experiments on light, sounds, etc. (Demers & Potvin, 2016; Wagenfeld, 2008). Whereas the design experiments follow different methods depending on the designer/researcher, the registering of an existing ambiance often follows the method of Commented City Walks developed by Jean-Paul Thibaud (2013).

The Commented City Walks approach captures both the perceived, the social and the climatic aspects of an atmosphere (Thibaud, 2013). The method has several stages. First, users of the site are asked to walk with the researcher and, while walking, express all the sensory and affective impressions that they have.

After descriptions from several users are gathered, the descriptions are analyzed in relation to the routes taken on the walks and the phenomena described. The different descriptions are combined into one ‘polygot’ compilation, where quotes from each walk are combined to make one text. This text serves as the foundation to develop hypotheses regarding the ambiance and identify its edge and points of particular interest. Following this, the researcher returns to the site to collect meteorological records, ethnographic observations, sound recordings and images and architectural measurements. This data serves as a contextualization of the polygot compilation. The results from Commented City Walks are the synthesis of perceived atmosphere data from the first site visit and registered atmosphere data from the second site visit.

The Commented City Walks method gives a detailed account of the atmosphere in a given location, capturing both atmosphere as perception, architectural quality, meteorology and climate, and social relations. It allows the researcher to ‘read the air’ in great detail. It can account for *how* actions take place (Thibaud, 2015) and, thereby, how people become attuned to the ambiance. However, the method does not assess whether the atmosphere allows for individual interpretation and how people may become ‘meiwaku’ – that is to say, mis-read the air and shift from the current mood to another. As Thibaud (2015, p. 44) points out, the focus is on registering the minute impregnation of people by the ambiance, rather than noticing moments of disruption and invitation for action.

*‘On the one hand, an affective tonality colours the whole of the current situation by conferring it with a certain physiognomy. On the other hand, an affective tonality does not necessarily take hold suddenly and brutally. It proceeds little by little, by slight impregnations made up of minute variations. From this perspective, it is hardly necessary to note or to be aware of it for it to leave its mark on our everyday acts and gestures. (...) It is as the continuous sound of the ventilation system which I finally erase from my field of consciousness or the stink of pollution which I end up no longer noticing, because it is so omnipresent in the city where I live. All that is needed is for the ventilation to stop or for me to return from a journey to regain awareness of what was already there. Impregnation can also be distinguished from invitation, what James Gibson calls affordance, which operates as a set of resources open for action. Invitation relates to what we are able to do in a specific environment whereas impregnation relates to how one feels within a specific ambiance.’*

In relation to the Anthropocene and the ecological thought, it is highly relevant to explore whether and how ambient impregnations (and subjectivation) lead to a de-sensitization of the surrounding atmosphere and, as Thibaud mentions, pollution. To gain a better understanding of agency and how individuals may become ‘meiwaku’ to regain an awareness of what is already around them, I now turn to the next concept – affordances.

Just like atmospheres, the concept of affordances shifts focus from the object to the relation between the object and the person. However, whereas design research on atmospheres is interested in affect, design research on affordances is focused on actions. Specifically, on the functional interactions with objects.

Affordances is a concept from the ecological approach to visual perception developed by James Gibson in 1976. The ecological approach to visual perception stresses, first and foremost, the inseparability of the individual and environment. The individual can never be understood outside of the environment in which perception takes place. And the environment can never be understood without the perceiving individual. Gibson rejects the notion of geometrical and physical space (in relation to the perceiving individual, but acknowledges its importance for natural sciences). Visual perception, according to Gibson, always takes place in the course of action. It is the result of an integration of the multisensory information that is picked up by a moving body in interaction with the environment (Gibson, 1986[1979]).

During interactions with the environment, individuals perceive *affordances*, and not objects. Affordances are perceived aspects of the environment that have functional significance for an individual (Gibson, 1986[1979]; Heft, 2010). In this way, just like atmosphere, affordances are both objective (properties of the environment) and subjective (perceived by an individual) (Ibid.). The functional significance can be understood as an invitation for an action as part of the person's movement through the environment. Following this understanding, affordances are possibilities for action that can be perceived by an individual. For instance, if I am running outside and pass by a bench, I might perceive the opportunity to stretch my legs. Whereas if I am walking with a coffee past the same bench, I might perceive the possibility to sit down. One object may have many functional significances (affordances). The affordance that is perceived will depend on the individual's current course of action and intention, skills and body, prior experience and social situation (Gibson, 1986[1979]; Heft, 2010; Rietveld & Kiverstein, 2014).

Gibson also introduces new terminology to describe the environment. The environment consists of a medium, surfaces and substances. Information that can be picked up by the sense-organs (sound waves, reflected light, chemicals) travels *through* a medium. The information is reflected off and directed by the surfaces of the substances in this medium. For instance, the walls of a room are considered substances with a particular surface. The walls separate the medium of one room from the medium of another room. In this way, information in the two mediums can stay separated. Individuals are also considered as substances with surfaces moving through a medium. In fact, all things are considered as substances with surfaces that add, reflect and redirect sensory information in a medium (Gibson, 1986[1979]). Gibson and other ecological psychologists describe the medium as air and do not discuss atmosphere or 'air-design'. (The connections and differences between medium and atmosphere are touched

upon by Thibaud, 2015 and Roquet, 2016). Following ecological psychology, one cannot 'design air', one can only design substances with surfaces that will add or redistribute the available sensory information available in the medium; that is to say, in air. In this way, designers can affect which affordances are perceived in the medium.

How to affect which affordances are perceived has been discussed as the *solicitation* of affordances (Withagen, Araujo & de Poel, 2017). The solicitation of an affordance can be understood as the degree to which it is perceived as inviting. Solicitations of affordances are perceived subconsciously – it is the individual's intuitive reaction with an object. As mentioned, one object has many affordances for an individual. But different environments will solicit the perception of different affordances. This has been distinguished as the landscape of affordances (all available affordances) and the field of affordances (the perceived affordances) (Rietveld & Kiverstein, 2014). Influences on the degree of solicitation of affordances have primarily been studied in relation to the individual and the social context – for instance, the individuals' current needs and prior experiences and the socio-cultural situation or 'behavior setting' (Ibid.; Heft, 2001). This research argues that the socio-cultural situation creates a shared regime of attention that aligns people's perception of available affordances. More studies are emerging on how spatial design can influence the shared regime of attention and solicitation of affordances, thereby creating a field of affordances (Withagen, Araujo & de Poel, 2017). However, these studies are rare. Most design research is focused on strengthening the association of an object with *one* affordance.

Objects that are associated with (primarily) one affordance in all contexts can be said to have canonical affordances. For instance, a chair strongly solicits us to sit down. This is a canonical affordance. It is the use-meaning of a thing (Costall, 2012). Canonical affordances are learned through participation in a socio-cultural context throughout life (Costall, 1995). As an example of this, in most cultures, parents encourage children to sit on a chair and discourage other interactions with a chair. The idea of canonical affordances has been actively explored by designers. Donald Norman (2013), for instance, has had a huge influence on design by discussing how the design of everyday objects can emphasize their canonical affordances. A classic example is how to design a door handle so that people open the door in the intended direction. This approach of working with design to strengthen coupling between an object and its canonical affordance dominates research and practice in this field to this day (e.g. Almquist & Lupton, 2009).

A different and less common approach explores the design of objects that de-stabilize associations with canonical affordances. Although affordances are mostly perceived subconsciously, according to Gibson and the ecological approach to visual perception, an individual can always take a step back and actively reflect on all the available affordances (Withagen, Araujo & de Poel, 2017). Consequently, design research focusing on de-stabilizing associations with canonical affordances explores individual agency by stimulating a

continuous re-interpretation of objects and the environment. In this research and practice, design of abstract and minimal shapes with an open function or polyvalence is encouraged to stimulate user creativity (Hill, 2003; Withagen et al., 2012, 2017). An often-analyzed example of this approach is the architecture of Herman Hertzberger and Aldo Van Eyck (Withagen et al., 2012, 2017). For instance, it encompasses the design of plinths instead of chairs and tables in the Vredenburg Music Center by Herman Hertzberger, and the geometric objects without a clear play function at the playgrounds by Aldo Van Eyck.

The contemporary design studio RAAAF has taken the idea of working with open function even further. According to Erik and Ronald Rietveld, founders of the studio, architects and artists can stimulate behavioral change by strategically choosing sites where it is desirable that objects gain a new meaning. At this site, the architects can work with forms that do not have canonical affordances. In this regard, users of the site are stimulated to explore, discover new affordances and re-interpret the site. According to the Rietvelds, such interventions set the process of change in motion without predicting its outcome (Rietveld & Rietveld, 2011). One example of RAAAF's strategic intervention is the 'End of Sitting' project. RAAAF identified the office landscape as a site for a strategic intervention based on the results from scientific studies showing that sitting down throughout the day is one of the biggest health risks in our society today. Together with artist Barbara Visser, RAAAF explored the design of objects with affordances that do *not* invite to sit down and, instead, invite to work in different bodily positions – while standing, leaning upon and lying down (Rietveld, 2016). The result of the project is a total installation for an office landscape where the tables and chairs are replaced by geometric rock-like formations.



Furthermore, to stimulate continued movement (which RAAAF argues is more healthy), the total installation does not provide comfort. In fact, users feel uncomfortable and tired after some time in one position and must change to a new position. This stimulates people to continuously move and explore the landscape of affordances. As Rietveld (2016, p. 928, 930, 931) explains:

*'This solicitation-related bodily readiness is why chairs can 'suck us in'. If we radically change the affordances available in a certain place, we will be able to generate behavioral change. Architects and artists are able to realize such a change in the built environment by creating new affordances. (...) The End of Sitting does not offer positions that afford working comfortably in a quasimotionless way for hours and hours, like office chairs typically do. (...) in The End of Sitting one's legs will get tired after about 30 min or an hour, and the person will switch to one of the many other positions in the landscape that fits better with the current body state. Perhaps she will be lying down for a short spell, or hanging with her arms over the horizontal black 'ropes' that support the upper body. (...) To facilitate and invite this alternation we aimed to build an entire landscape of affordances with many different attractive positions.'*

Design that stimulates continuous individual exploration of the environment and the discovery of new affordances has also been analyzed by Reuben Baron (2008). Baron is particularly interested in the role of bringing the body out of balance and creating a productive discomfort. Focusing on the architecture of Arakawa & Gins (A&G), he identifies tentativeness as a central design concept and strategy to stimulate agency. Tentativeness refers to the indecisive quality of interactions between an individual and the environment. Indecisive, in this case, is not understood as negative. Rather, it is considered as the opening up of innumerable possible outcomes. Following this, tentativeness is considered as an opportunity, rather than a problem. Tentativeness, argues Baron, can be induced in the form of spatial disorientation or by bringing the body out of balance. In A&G's architecture this is achieved, for instance, by designing two adjacent rooms with floors sloping in opposite directions and by designing the floor of a large open space in the form of a hilly landscape that affords walking on in some parts and climbing on in other parts. By continuously bringing the body out of balance, the architecture of A&G leads to the establishment of new connections between sensory modes – for instance, new links between tactile, kinaesthetic and visual information. In this way, Baron argues, new (bodily) skills can be learned and, thereby, new affordances can be discovered.

By offering new adaptive challenges to habitual behavior, tentativeness in interactions can expose the individual to a wider range of environmental affordances. That is to say, it can shift attention from the field of affordances to the landscape of affordances. Following the philosophy of A&G, Baron argues that the role of architecture is not to resolve problems between people and their environment, but rather to create productive problems. Furthermore, Baron (2008, p. 340) argues that tentative interactions can also make an individual more critically aware of the ambiance behind routine actions:

*'Indeed, William Ittelson reminded us in 1973 that one of the major properties of environmental perception is that we respond to the overall climate or emotional ambience of the environment in a direct, nonmediated way. In this vein, these artists and architects offer us a*

*kind of “spring awakening” from the routines of everyday life. Viewed in this way, art is more than an enjoyable distraction and architecture is more than protection from the elements. Each offers the possibility of more deeply engaged transactions with the environment.’*

As briefly implied in the quote by Reuben Baron, the design strategies of tentativeness and objects without canonical affordances might also contribute to bringing the ambiance to awareness. By designing a productive problem, people are invited to take a step back, reflect on the ambiance and explore the landscape of affordances. The shared regime of attention is (momentarily) disrupted, allowing people to ‘read the air’ and critically reflect on the ambient subjectivation. Furthermore, by exploring the landscape of affordances in everyday spaces, new action possibilities can be discovered that challenge habitual behavior. Ambiance and atmosphere are not explored in affordance theory, research or design practice. However, the design approach of tentativeness can be a way to bring attention to the ambiance and atmosphere of overlooked urban spaces and, thereby, stimulate agency. With regards to the Anthropocene and the ecological thought this might allow us to explore and re-discover the surrounding environment and re-calibrate our senses to perceive the minute atmospheric fluctuations.

Finally, it is important to note that empirical research on affordances is based on a method of observing and recording the perceived affordances; that is to say, the field of affordances (e.g. Heft, 2010). Following this method, a researcher observes the interactions between people and objects on a site and records the actualized affordances. An example can be to observe an outdoor playground and record that sand affords to throw, step on, sit on, dig in, build castles, and so on. This method allows one to analyze the observed actions in relation to the objects, courses of action, bodily skills and socio-cultural situation that give rise to them. It also allows one to register any change in interactions over time by observing the actualized affordances on a site at different times (e.g. before and after an installation). Although the method does not register any information on atmosphere or ambiance, it allows one to study the change in explorative behavior and, thereby, reveal any changes in the field of affordances and the degree of agency in a situation. Furthermore, if this method is combined with the Commented City Walks method, this would allow one to explore the correlation between ambiance and field of affordances. However, such studies have, as yet, not been conducted.

## EXPLORING THE LINK BETWEEN ANTHROPOCENE, ATMOSPHERE AND AFFORDANCES

Having introduced the three concepts and briefly hinted at their interrelation, I now describe how each concept has expanded my expectations to design and sketch out a propositional conceptual link that I explore in my research through design process. This link is captured in the words of Jean-Paul Thibaud (2015, p. 41):

*‘How can the air of urban wellbeing, the air of commercial conditioning and the air of atmospheric pollution succeed in meeting and agreeing?’*

Each of the three concepts offers paths into design practice. The concept of atmosphere highlights the potential of air-design to increase multisensory and affective interactions and intensify the expressiveness of human activity. But it also emphasizes how air-design is used as a tool to constrain agency in everyday urban spaces by impregnating people with a mood without their awareness and neutralizing the expressiveness of their actions. This highlights the importance of becoming ‘meiwaku’ and mis-reading the air to disrupt habitual behavior and critically reflect on the atmosphere and ambient subjectivation. Here, the concept of affordances introduces relevant design strategies that disrupt the shared regime of attention and stimulate explorative behavior. Design strategies for this include activating the body, creating tentativeness in the situation and working with objects without canonical affordances. Such design interventions stimulate a shift in attention, allowing people to step back and reflect on all possible moods and action possibilities in an environment. In so doing, people can explore the landscape of affordances and, potentially, become sensitized to the minute variations in the atmosphere. Finally, the concept of the Anthropocene draws my attention to overlooked aspects of nature such as pollution, dust and urban wildlife, and highlights the importance of sensitizing people to these conditions.

These different design approaches are linked in my research through design process. In accordance with the concept of the Anthropocene, I select an urban site for my design exploration where we daily overlook climatic issues and subnatures. At this site, in accordance with the concept of atmosphere, I work with materials that stimulate multisensory interactions and intensify the expressiveness of people’s actions. And, in accordance with the concept of affordances, I create productive problems by working with tentativeness and forms without canonical affordances. To evaluate the effect of my installation, I use the observational methods described in this chapter to register both the affordances and atmosphere on-site during and after my installation and register any changes in perception. Thus, my design exploration allows me to explore whether multisensory interactions that intensify the expressiveness of people’s actions can create a tentativeness and shift in attention that stimulates the exploration of new affordances and engagement with the overlooked Anthropocene entanglements. In this way, the design exploration addresses whether and how architectural aesthetics can catalyze agency.

Returning to the beginning of this chapter, engaging with the useful aspects of theory also means having an openness to the effect of practice on theory. Following this understanding, by combining these strategies in one design process, I explore a theoretical link between the three concepts through design. The concepts and their interrelation was not a hypothesis, but a starting point for my design process. In fact, a conceptual link was first formulated during my research through design process. This design exploration and the formulation of the conceptual link is described in the following chapters.



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## METHODOLOGY

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*We need new ways to describe architectural works in a way to show the genuine assemblies necessary for the architectural object to come into being, mobilizing both new rhetorical and visual tools. This will allow us to talk about architectural objects without contradicting our daily design experience of making or inhabitation. (...) These questions will direct us toward another way of renewing aesthetic discourse: not by freeze-framing buildings, but by accounting for duration, for transformation, and for all the changes of design, development, and inhabitation.' Yaneva & Mommersteeg, 2019, p. 230.*

Research through design is a methodology to follow the process of design as it happens. It allows one to account for the assemblies necessary for the becoming of an architectural object, and the processes of its transformation, change and inhabitation. This, as Albena Yaneva argues in the opening quote, is necessary for renewing aesthetic discourse. In my research project I am interested in contributing to aesthetic discourse by exploring architectural aesthetics as a catalyst of agency. I do this by following the trajectory of and reflecting upon my design process of an architectural installation. In the design process I explore the link between the concepts of Anthropocene, atmosphere and affordances.

This link was not defined at the beginning of my design process – it was developed in the complex interactions between my collaborators, sites for design exploration and design tactics. Consequently, my design process is driven by formulating interim hypotheses about the link between the three concepts through my design tactics. As soon as a hypothesis is formulated, it is challenged and further developed in interactions with the collaborators and site. These interactions often lead to formulating a new interim hypothesis, which is then again challenged and developed. In this way, my design process is continuously driven by finding and exploring the link between the three concepts in dialogue with the assemblies necessary for the realization of an architectural object. My design process and exploration of the conceptual link concludes with the realization of an architectural installation. The installation expresses the conceptual link in its design. This design and link is then contextualized through new activities, which offer further perspectives to understand my research through design methodology. This concept-driven research through design methodology is presented in this chapter.

In the previous chapter, I discussed how the theoretical concepts provided paths into my design exploration. In this chapter, I unfold my concept-driven research through the design methodology and describe my design tactics and how they contributed to my exploration of the conceptual link. I begin with a short introduction to the methodology, and, following this, I introduce the specific aspects and tactics of my research through design process. Then, in the next chapter, I present the trajectory of my design process.

RESEARCH THROUGH DESIGN Research through design is a methodology that has gained momentum in architectural research (Dunin-Woyseth & Nilsson, 2012). The methodology is focused on the design process and allows one to explore, articulate and develop the tacit knowledge at the core of architectural practice. Arguably, architects have always conducted design research by reflecting during the process of artistic creation (Hill, 2013). However, research through design as a methodology with a defined framework and applied in research institutions is relatively new and still in development (Jakimowicz & Verbeke, 2009). Accordingly, the methodology is referred to by different authors as research by design, research through design, and research into design. There are no significant differences between these terms. In this thesis I have chosen to use the term research through design. I refer, however, also to literature on research by design.

It is important to highlight the difference between the research through design methodology and other traditions of design research. In the 20th century architectural research and practice has been interested in applying science to making ‘objective’ design theories with the aim of creating design protocols and typologies that could be repeated (Cross, 2006). Furthermore, there was an interest in using scientific methods to understand and explain the design process. Also, today such scientific design research is common in certain areas – for instance, in evidence-based design (Frandsen et al., 2011) and when applying material and engineering science in tectonic research (Rahm, 2016; Hensel, 2013) and behavioral science in nudging research (Byerly et al., 2018). However, the scientific approach to design research has been criticized by, most notably, Donald Schön, for not engaging with the actual, complex situation of architectural practice and, therefore, not explaining the process of architectural design. This critique inspired a shift in architectural research towards a focus on the design process as it occurs. As Nigel Cross elaborates (2007, p. 41):

*‘In the past couple of decades we have seen a significant shift in focus within the field of design research. It is a shift from the aim of creating a ‘design science’ to that of creating a ‘design discipline’. The focus is now on understanding the design process through an understanding of design cognition, or the ‘designerly’ ways of knowing and thinking.’*

In accordance with this, research through design develops knowledge on the designerly ways of knowing (Cross, 2006; 2007). In research through design the

researcher designs an artifact while documenting, reflecting upon and analyzing the process of creating (Verbeke, 2013). A design process and creative activity rely on abductive thinking and reflected subjectivity (Ibid.; Kolko, 2010). Abductive thinking can be understood as drawing syntheses between different inputs to create an outcome – the designed object (Ibid.) The abductive process strives to produce a novel, innovative design solution to a problem. This has been referred to as Mode 2 knowledge (Dunin-Woyseth & Nilsson, 2012; Jakimowicz & Verbeke, 2009). Mode 2 knowledge emerges in creative exploration and problem solving and is therefore a natural part of designerly ways of knowing. Mode 2 knowledge is often focused on finding a (design) solution, and, in this process, follows research problems as they emerge and often draws on transdisciplinary inputs (Dunin-Woyseth & Nilsson, 2012). This differs from a scientific process which is based on inductive thinking (gathering data, building a hypothesis, testing the hypothesis) or deductive thinking (building a logical argumentation to explain a subject). Both inductive and deductive thinking strive to achieve objectivity and a general rule (Groat & Wang, 2013). The scientific process generates Mode 1 knowledge. Mode 1 knowledge explores a research problem that is defined before the experimental process. The research problem is disciplinary and set within the interests of a specific academic community (Dunin-Woyseth & Nilsson, 2012; Jakimowicz & Verbeke, 2009).

Research through design generates Mode 2 knowledge by following the abductive process of a designer/researcher. Each designer/researcher may have individual design tactics and approaches, and will produce unique design products. The designerly ways of knowing, therefore, reside in the individual person who is designing, the process, and the product of design (Cross, 2007). The designer/researcher generates new knowledge by reflecting on and articulating the specific design tactics and approaches used in the design process. Such reflection can lead to the development of new strategies for future design processes. Furthermore, the designer/researcher generates new knowledge by analyzing precedents to develop the design product, and, following realization, reflecting on how the product’s forms, materials and finishes embody design attributes (Ibid.).

CONCEPTUALLY-DRIVEN  
RESEARCH THROUGH DESIGN

The aim of my research project is to address how architectural aesthetics catalyze agency by understanding the relation between perception of atmosphere and affordances (research question one). Furthermore, I explore how the concepts of Anthropocene, atmosphere and affordances can inform and drive a design process (research question two) and how this design process can inform, and possibly transform, the theoretical concepts (research question three). This design process contributes to critical spatial practice (research question four). Consequently, my research through design methodology is adapted to this purpose. The design process is focused on finding, exploring and expressing the link between the concepts of atmosphere, affordance and Anthropocene with the intention to contribute to theoretical development.

Having the purpose of theoretical development through a design process is a less traditional approach to design (Stolterman & Wiberg, 2010). This purpose makes the design process conceptually driven, whereas traditional design processes are most often artistically driven (e.g. Bertram, 2011) or situationally driven with the purpose of improving an existing use-situation or technology (Stolterman & Wiberg, 2010). A situation-driven design often has a problem to solve and is assessed for the extent to which it resolved an undesired situation. A concept-driven design, on the other hand, is an exploratory investigation of established theories and is assessed for its development of concepts and setting an agenda for future research. The outcome of a concept-driven process – the designed artifact – is based on theoretical work and carries the insights of theoretical analyses. Furthermore, concept-driven design is focused on envisioning and testing future use scenarios and exploring new design spaces (Stolterman & Wiberg, 2010, p. 110):

*‘Concept design is about opening up and exploring new design spaces or finding unseen parts of already known spaces. The exploration should lead to new ideas that challenge the prevalent theoretical understanding. Concept design research does not strive to refine or test established ideas; instead, it explores new territories and design spaces.’*

A concept-driven design process comprises the following activities: concept generation, concept exploration, internal concept critique, design of artifacts, external design critique, concept revisited, and concept contextualization (Stolterman & Wiberg, 2010). Although all these activities are similar to any other design process, there are a few differences in focus. Most notably, the concept generation is based on relevant theory in the field and might be achieved through associating concepts that have yet not been explored together. Furthermore, the internal concept critique is based on both an evaluation of the uniqueness of the developed concept in relation to existing theory and to how well it can be expressed in a concrete design. In the design of artifacts, the theoretical concept must be manifested through skilled craft. Following this understanding, the external design critique is based on exposing the design to the public and critically validating the conceptual and theoretical assumptions in the designed artifact. This critique results in revisiting the concept. However, it is often a challenge to isolate the factors leading to the external design critique in a concept-driven design process. This is because the critique can be provoked by a flaw in the initial conceptual idea or in an inappropriate composition or insufficient components in the designed artifact. Finally, in concept contextualization, the revised concept is positioned in relation to existing concepts and theoretical work (Ibid.).

These five activities can also be identified in my concept-driven research through design process. Concept generation was based on developing a new link between the concepts of Anthropocene, atmosphere and affordances. In exploring this conceptual link, I was particularly interested in developing future use scenarios and identifying new design spaces. My exploration of the conceptual link can be described in three stages. Each stage was informed

by theories of atmosphere and affordances and driven by internal concept critique. Furthermore, each stage was connected to a different site for design exploration. During the first stage, my exploration was focused on finding a connection between the concepts of Anthropocene, atmosphere and affordance by focusing on air-design and the medium. This exploration aimed at stimulating agency at the Nobelparken corner of the Nordre Ringgade-Randersvej crossroads in Aarhus, Denmark. In the next stage, I explored the connection between these concepts with a particular focus on shared regimes of attention. This exploration aimed at stimulating agency on the pedestrian islands of the large Nordre Ringgade-Randersvej crossroads. And, in the third and final stage, my exploration was focused on multisensory interactions that intensified the expression of people’s actions. This exploration aimed at stimulating agency at the smaller crossroads between Ryesgade and Banegårdspladsen in Aarhus, Denmark. The three stages concluded with the design of an artifact and external design critique which validated the conceptual and theoretical assumptions. This critique resulted in revisiting the proposed conceptual link and exploring it from a new angle in the consequent stage. It was only the third stage, however, that resulted in a designed artifact that was realized as an installation in public space that could be assessed for its effect on perception.

This installation, entitled Urban Carpet, did not aim at solving or improving a use-situation. Rather, its aim was to express the conceptual link, explore a new design space and effect people’s perception, thereby contributing to the development of theory and design practice. Following this aim, my final external design critique critically validates the theoretical and conceptual assumptions in the designed artifact. This is achieved by assessing whether multisensory interactions with Urban Carpet can create a shift in attention that leads to the exploration of new affordances, an awareness of the atmosphere and engagement with issues of the Anthropocene. To assess this effect, my external design critique was primarily based on observing interactions with the artifact using the experimental methods of the theory of affordances and the theory of atmosphere described in the previous chapter. I registered the atmosphere and actualized affordances on the site before, during and after my installation. This allowed me to assess both the effect of interactions with the installation on people’s perception and whether the theoretical assumptions were expressed in my installation. This evaluation led to revisiting the conceptual link and theories. Finally, my revised concept and design process was contextualized in two activities – an evaluation of the design and effect of the installation Sense Envelope V by AREA studio and developing a history and theory course based on my design process for undergraduate students.

My concept-driven research through design methodology produced both Mode 1 and Mode 2 knowledge. Throughout the design process, I articulate and reflect on my specific design strategies, tactics and choices, and I analyze the resulting design product. Furthermore, throughout the design process, I am focused on finding (design) solutions and addressing problems and transdisciplinary inputs as they emerge. In this way, I generate Mode 2 knowledge about a design process and product that explores architectural aesthetics and agency through

the concepts of Anthropocene, atmosphere and affordances. My final design critique and effect evaluation, however, follows pre-defined research methods and, in so doing, produces Mode 1 knowledge on perception of affordances and atmosphere. In this way, my research through design methodology contributes with new knowledge to both the architectural design discipline and advancement of perception theories.

#### MY RESEARCH THROUGH DESIGN PROCESS

A research through design process can be said to have four parts: input, operations, output and deliverables (Verbeke, 2013). Input can be understood as the start of the design project and can include the design ideas and thoughts of the researcher/designer, a literature review or interviews with people concerning the design process. Operations are understood as the processes that develop and transform the input. This can include experiments, new interviews and new experiences. The operations may lead to new input or to an output. Output refers to the endpoint of an operation; that is to say, when the transformation of an input has reached a conclusion. Outputs may include general statements, designed objects or spaces and teaching tools. The outputs are manifested and communicated in deliverables. Deliverables may include exhibitions, papers, design tools and the designed object or space.

My research through design process has five parts – a beginning, the three stages of concept and design exploration and an ending. The first part, the beginning of the research through design process, consists of determining a site for my design exploration and making observations of affordances and atmosphere on this site. This provided input into the following three stages of concept and design exploration. The three stages of concept and design exploration have also received input from the literature on the Anthropocene, atmosphere and affordances and design precedent studies. Furthermore, in each stage I engaged in collaborations with different architects on my design exploration and these dialogues also provided input to my research through design process. Finally, the three stages of concept and design exploration had different sites, and the site analysis as well as safety issues and other regulations also provided input to my research process. This input was transformed by different operations in the three stages, leading to different outputs and deliverables. The main deliverable of the first stage is an article manuscript and visualization of a design concept, the main deliverable of the second stage is a journal article and an exhibition, and the main deliverable of the third stage is an article, the installation Urban Carpet, and an exhibition. Following the conclusion of my design exploration, I produced two more deliverables – an evaluation of Sense Membrane V and a history and theory course. These comprise the fifth and final part of my research through design process. The deliverables contextualize my conceptual and design exploration.

For the operations of each stage I applied the design tactics of using theory, writing and metaphor, collaborating with an architect and making an installation

for a public site. These tactics are closely connected with the conceptually driven research through design methodology and my background, which lacks technical construction training. All four tactics contributed in different ways to my theoretical and design exploration and express different designerly ways of knowing. Their differences allow me to compare, analyze and develop knowledge for a design approach working with architectural aesthetics and agency through the concepts of Anthropocene, atmosphere and affordances. In the following sections, each tactic and its contribution to my design process is described in depth. In the next chapter, I describe and reflect upon my research through design process.

#### USE OF THEORY

Following a conceptually driven research through design methodology, I actively used the theoretical concepts and discussions presented in the previous chapter to generate a conceptual link that could be explored through design. This can be understood as my particular design strategy, which is grounded in my prior experience with psychological research and artistic concept development. This use of psychological and social science theory differs from other, more common, approaches where theory is used to understand the users' behavior and current needs (Wahlström et al., 2016; Frascara, 2002). When users' needs are applied as direct design input, the outcome is most often a better version of the existing use scenario. However, when using social theory to generate a design concept, it is possible to surpass current needs, and instead identify general values and aims in the users' existing activities. In this way, theory is used to analyze the users' needs so they can be applied in design in a more abstract way. Furthermore, Wahlström et al. (2016, p. 874) argue that use of theory can lead to radical design innovation by focusing on people's potential activities and a future that is different from the present:

*'It seems plausible that introducing social or psychological theories to the design process could yield innovations of this type. Providing greater abstraction and 'forcing' the data into the categories and vantage points of the theories could be ways to identify potential activities of the future; theories can be translated into design goals in the manner seen in the case study'.*

This process of using theory includes elements of abstraction and concretization. Abstraction helps us to organize observed data (for instance data from site observations) into frameworks that simplify and organize the data. Following this, concretization makes the organized data tangible for design. The theoretical content can be concretized in processes of goal-setting, visualization, and thematization, which have the capacity to guide the design process. Theories can be transformed into inspirational themes before leading to design ideas (Wahlström et al., 2016). Furthermore, the use of theory creates a framework that pushes or contrasts the logic of physical conditions of the project (Bohn, 2011). The theory creates constructive obstructions that help to further drive the project.

In my design process, the theories on the Anthropocene, atmosphere and affordances organized and focused my observations of the site of my design exploration. These observations helped to explore the link between the concepts and to identify new design spaces and alternative ways of interacting on-site. The theories also created a framework for evaluating design ideas and the impact of the designed outcomes against the set goal. That is to say, I was constantly evaluating whether my design idea could stimulate a shift in perception that would catalyze explorative behavior and draw attention to the atmosphere and issues of the Anthropocene. My use of theory to identify potential future activities on site was concretized and communicated through inspirational metaphors and visualizations.

#### USE OF WRITING AND METAPHOR

The use of theory as a design strategy is closely connected to the use of writing and metaphor. Although

design processes are most often associated with sketching, writing has been a driver for design of architects such as Adolf Loos, Bernard Tsumi, Scott Brown and Robert Venturi and Rem Koolhaas (Bohn, 2011; Gstach & Kirschbaum, 2016). Writing in architectural projects is often only connected to formulating of the program at the beginning of the project and communicating the end result in a short text once the project is finished (Bohn, 2011). However, as a driver for design, writing can be applied in all stages of the design process. As Bernard Tsumi elaborates (Tsumi, 2006, quoted in Bohn, 2011, p. 16):

*“I have always talked about going back and forth: the concepts I derive from writing are not quite the same as the ones I derive from drawing. And when they reinforce one another, it can be very exciting.”*

Bohn (2011) suggests five ways in which writing can be actively used as a driver in a design process: working with theory, writing articles, describing moments of experience, describing time through narrative and using metaphor. The first two methods – working with theory and writing articles – are primarily analytical and can help to organize and simplify thoughts, further inspiring the design project. Article writing can be considered a parallel and complementary activity to designing an artefact – often expressing different ideas that develop each other. The last three methods – describing moments of experience, describing time through narrative and using metaphor – are imaginative and can help articulate thoughts that are difficult to communicate in a sketch or model. Whereas a model or picture is often exact, the imaginative writing is more open-ended and can be interpreted by different people in different ways. The description of a moment of experience (of the imagined design or of the site) can add a feeling (an atmosphere) to the sketches and models. Describing time through a narrative can explain the spatial complexity of and envisioned behavior in the architectural project. Furthermore, the narrative can capture the sensual and atmospheric aspects of experience. The metaphor can capture the aim and logic of the whole project. Architecture is often discussed in technical terminology or with regards to physical conditions. The metaphor

allows us to communicate the idea behind architecture by opening up people's associations and, thereby, facilitating a discussion (Bohn, 2011).

In the course of my design process, I wrote three theoretical articles and two essays. Two of the theoretical articles were published in peer-reviewed journals, while the third I decided to withdraw from review. The essays were written in connection to participating in an exhibition and organizing a course for students. The theoretical articles contributed to concept generation, exploration and internal validation at different stages of developing the link between the concepts of Anthropocene, affordances and atmosphere. The essays, on the other hand, employed imaginative and narrative writing, allowing me to imagine and critically reflect on the envisioned experience of my designed artifacts. I also employed narrative writing in my site observations for registering the atmosphere. The narrative writing contributed to concretization of the abstract theoretical concepts in verbal visualizations.

The strategy of using metaphors proved to be particularly useful in my design process. The use of metaphors is a well-known strategy in design processes (Casakin, 2012; Cupchik, 2003). Metaphors are, in particular, used in the early stages of the design process to elaborate initial design concepts and reformulate design situations from unexpected perspectives. This has been referred to by Daniel Schön as generative metaphor (Cupchik, 2003). Metaphors allow us to momentarily surpass restrictions of site and imagine unorthodox solutions (Casakin, 2012). Furthermore, metaphors create a conjunctive ambiguity where several fields are connected but remain intact. These fields are often unrelated but share some underlying similarity. This underlying similarity is enhanced by the metaphor and creates a focus for finding design solutions (Cupchik, 2003). Metaphors allow us to map relationships between concepts that might have some features in common but are normally unrelated. This stimulates lateral thinking that helps establish new relationships and perspectives (Casakin, 2006). In this way, metaphors contribute to the creation of conceptual meaning and new knowledge (Casakin, 2012, p. 331):

*‘The ambiguous character of these cognitive instruments allows exploring unfamiliar concepts and establishing novel correspondences with remote domains that are not connected to the problem at hand. Metaphorical reasoning permits the identification of previously unnoticed similarities regardless of the existence of vast difference. In the interplay between similarity and difference, conceptual meaning emerges and new knowledge categories such as technology are created.’*

I used metaphors in all stages of my design process, and especially during my dialogues with architects. This strategy proved to be particularly valuable in the transitions between concept generation and concept exploration. Metaphors allowed me to translate abstract ideas from concept generation into design ideas that could be explored. Furthermore, the metaphors themselves often contributed to concept generation by linking unrelated experiences. Following this, insights from the metaphors and design explorations could be used for

revisiting the concept generation and developing new metaphors. In essence, metaphors acted as my verbal sketches.

COLLABORATION WITH AN ARCHITECT AND A PUBLIC SITE      The strategy of using metaphor is closely related to the strategy of collaborating with an architect. In my case, this is an interdisciplinary collaboration in design. Studies on collaboration in design are very broad and range from explorations of co-design, participatory design, co-creation and others (Wang & Oygur, 2010). To define and differentiate collaborative design from, for instance, cooperation and teamwork, Wang and Oygur identify several characteristics. First, collaboration happens when at least two practitioners with distinct cultural-epistemic-praxis backgrounds engage in productive interaction. The differences in culture, epistemology and praxis allow for the meeting of different object worlds and disciplines. Such collaboration results in productive exchanges where new, shared viewpoints emerge. The shared viewpoints can be understood as an enabler event as they further the collaboration by transcending the barriers between differences in the cultural-epistemic-praxis backgrounds. However, not all processes succeed in reaching a shared understanding – this can be understood as a barrier event. Reaching shared understanding takes place through iterative cycles that push the design forward (Ibid.)

A key aspect of the iterative cycles is the dialogue that often occurs during the design activities. This dialogue gives an opportunity for an open and informal reflection – an immediate conversation while the event is taking place. Such a reflection is complementary to the more organized reflection occurring when using writing and theory as a design strategy (Rouhiainen, 2008). Moreover, during conversation the collaborators learn more about their individual assumptions and thereby gain a deeper and broader understanding of the subject and the emerging design.

Several steps can be identified in the collaborative process integrating different disciplines: transfer, translate, transform, evaluate and communicate (Hansen & Mullins, 2014). The first step, transfer, is based on imagining and questioning together to formulate a shared vision that is meaningful to all participants. This shared vision creates a common commitment. In the subsequent phase of translating, the shared vision is explored in relation to each of the participants' different knowledge. Following this, in transformation, the different explorations are merged and expressed in a design by using a common language of models, photographs, sketches, diagrams and concepts. Finally, in evaluation, the design is evaluated in relation to the different knowledges of the collaborators and the gained knowledge is collected to be communicated holistically. In general, for the collaboration and dialogue to be fruitful, there needs to be a trust and shared commitment between the participants (Ibid.; Rouhiainen, 2008).

In my design processes, all collaborations took place with professionals with very different cultural-epistemic-praxis backgrounds to my own. The dialogues

with collaborators also brought many assumptions to attention and allowed me to reflect more critically on the three theoretical concepts. However, a shared understanding was not reached in all collaborations. In the first stage of my design process, I collaborated with the architect Kato Hiroshi. Our dialogue began with the step of translation and explored different visions. However, having bypassed the step of transfer, a common vision and commitment was not reached, and the collaboration ended before the step of transformation. On the other hand, my collaboration with the architect Elias Melvin Christiansen in the third stage of my design process was fruitful and succeeded in creating a common vision, language and design. As a third example, in my collaboration with AREA studio on the design and evaluation of Sense Envelope V, a shared vision was reached, but there were significant language barriers that hindered the process of transformation. Both Sense Envelope V and Urban Carpet also went through the stage of evaluation where the design was assessed both from my perspective (of affordances and atmosphere and the Anthropocene) and the collaborators' perspectives. However, both processes stopped before the last phase of communication, and the different evaluations have therefore not been merged to generate knowledge incorporating both perspectives.

Finally, the design tactic of realizing an installation for a public space was crucial for my exploration of architectural aesthetics as a catalyst of agency. It was necessary to design an installation for a public space to assess whether multisensory interaction with the installation could create a shift in attention, stimulate the exploration of new affordances and, potentially, bring the atmosphere to awareness. The collaboration with an architect was closely related to this tactic, allowing me to compensate for my lack of knowledge on construction techniques and technical drawings. The process of realizing an installation for a public space also gave rise to a collaboration with municipalities and the respective regulations and restrictions on site. This led to more dialogues and the establishment of shared visions, which provided input to the design process and influenced the design artifact. It is also due to restrictions from municipalities that the first two stages of my design process ended without the realization of an installation and with a change of site. Incorporating collaboration with municipalities as part of my design process added a dimension which is lacking in research through design projects taking place in lab-like settings (for instance, in form-finding studies and material innovation, as discussed in Michael Hensel, 2013). In this way, my research through design process articulates the process of becoming of an architectural installation in the complex interactions with people, regulations and things. In the next chapter, I present my design process by tracing its trajectory.

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## DESIGN PROCESS

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*'If a project covers the process of step-by-step realization of an idea, a trajectory accounts for the explorations, the discoveries, the numerous detours and unpredictable surprises that might occur. It stands for the entire experiential dimension of the process of making of a design. It is at the same time the activation and the result of many accidental encounters. Arguing against the preconception of design as project-making and project realization, the stories that follow will account for the trajectorial nature of design.'* (Yaneva, 2009, p. 27–28)

In the previous two chapters, I introduced the theoretical starting point and lexicon of my design process, along with my design tactics and concept-driven research through design methodology. In this chapter, I present the trajectory of my design process that began in November 2016 and concluded in March 2019. Arguably, the design process culminated with the installation of my designed artifact 'Urban Carpet' in Aarhus, Denmark, in August and September 2018. However, as the opening quote implies, a design process is not a linear development of a design idea. According to Yaneva (2009), the design process takes place in the complex and mundane entanglements of everyday life, not in an isolated studio context. Reflecting on and reacting to design instruments and user complaints is just as much a part of the design process as experimenting with the fit between concept, form, materiality and site. Only from a distance does a design process appear as a linear development of an idea. In the midst of designing, however, one rarely knows the exact direction (Ibid.). Accordingly, to understand a design process, one must trace all the encounters and accidental events that influence its trajectory.

Such a trajectory of my design process is presented in this chapter. The trajectory is chronologically organized, following my design process from its very beginning to its very end. However, it does not trace a linear design development of my installation, Urban Carpet. Rather, it is a description of a design process that is both reflexive and responsive. It is reflexive with my own reflections-in-action, and it is responsive to the many unplanned events, meetings, things and other issues that entered its trajectory. The reflections and responses altered the course of my design process by introducing new design concepts, precedents and models. Some of these were then later abandoned

due to reflections and responses to new events and encounters. I describe all of these concepts and models, instead of only focusing on the ones that are directly linked to the realized design artifact, Urban Carpet. It is the sum of all the reflections and responses that account for a design process in its totality (Yaneva, 2009, 2011).

This approach to design description follows the pragmatist tradition of focusing on the everyday. It is important to note, however, that Albena Yaneva makes research *into* design (Yaneva, 2011). I am, on the other hand, using the method of research *through* design. My intention is to identify and explore the link between the concepts of Anthropocene, atmosphere and affordances. Therefore, I also trace how the link between the three concepts is gradually formulated during my design process. I do this by presenting the design process trajectory in five parts – the beginning, stages one, two and three, and the conclusion. Each part marks a significant change in my reflection and analysis of the link between the three concepts and a significant change in events that I respond to with my design exploration. I finish each part with a preliminary conclusion. These preliminary conclusions are not part of the design trajectory. Rather, they are components of my subsequent analysis of the design process and conceptual link, and lead to the main conclusions of this thesis, which are presented in the next chapter.

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## BEGINNING THE DESIGN PROCESS

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I began my research project in October 2016 by planning a design workshop for a studio at the Aarhus School of Architecture. The site for the workshop had already been decided upon prior to my involvement – the students were to design an installation for the corner of Nobelparken, Aarhus University, on the Nordre Ringgade-Randersvej road crossing. This is the largest road crossing in Aarhus, and the Nobelparken of Aarhus University (including the corner at the crossroads) is designed by C.F Møller Architects in 2004.

I entitled the workshop ‘Atmospheric Interventions’ and planned it for two weeks, with the design phase in February 2017 and the building and realization phase in March 2017. The workshop was envisioned as an idea-generator for the students’ semester projects and a kick-starter of my research through design process. The workshop would begin with an introduction to the theoretical concepts that I work with and the potential of design to stimulate agency through aesthetics, continue with a design process that followed predefined criteria, and conclude with building and installing the installation on-site. I formulated criteria for the students’ design concept based on a site visit and the theoretical concepts and made detailed observations of people’s interactions on-site before the workshop. I planned to make observations of people’s interactions on-site after the workshop to register any changes and analyze the effect of the students’ installation on people’s agency. Furthermore, it was planned that the students’ installation would be a prototype for my research through design process, and that I would use my analyses to make a second installation (an adjusted version of the students’ installation) for the same location in September 2017, and then make observations of its effect. However, one week before the workshop was scheduled to begin, due to unexpected events, the studio was closed and the workshop was cancelled.

I was left with the before observations of the site, a very brief precedent analysis, some sketches and a formulation of the criteria for the students’ design concept. I decided to continue working with this material and the site. Thus, the site observations and design criteria became the beginning of my own design process.



FIRST SITE VISIT AND FORMULATION OF DESIGN CRITERIA

My first visit was on November 24, 2016. This was the very first time I saw the site, and I was focused on understanding its qualities and people's behavior. My site

visit was short. I only performed informal observations and recorded the visit by taking photos. I was struck by the business of the road crossing – and the lack of social activity on the corner itself. While benches and plant beds had been created, the benches were being used for bicycle support, and the plant beds had old beer cups in them. Students from the university were walking diagonally through the corner, rarely stopping, and generally only to park their bicycles. I also noticed that the corner was raised from the sidewalk with steps – and that it was possible to see the sea from the steps at the edge of the corner by looking down the road towards Aarhus Harbor.



From this very brief observation, I identified two issues in relation to my theoretical framework. First, the corner already had affordances for social activity (i.e. benches), but no social activity was taking place. Second, there was the potential to view the sea from the corner, but there were no affordances for actualizing this potential. Following this, I reasoned that if an installation could add to the corner an affordance for looking at the sea, this would invite people to spend longer time at the corner



and (possibly) have an aesthetic experience (lingering at the sea view). This, in turn, would create a more recreational mood and atmosphere at the corner, which could motivate people to use the existing affordances for social activity. This became my first working hypothesis for the design process – that adding an affordance that invites people to have an aesthetic experience at the site would catalyze social activity by changing people's perception of the existing affordances.

To formulate my design criteria for the students, I analyzed this hypothesis in relation to my original precedent studies of the End of Sitting by RAAAF and the Empowerment of Aesthetics by SLA. I decided that the students should work with ambiguous forms to stimulate exploration (such as RAAF) and enhance the existing features through materiality that stimulates multisensory interactions (such as SLA). This was formulated as the following design criteria:

*An installation that encourages social and multisensory interaction, highlights and enhances the existing features of the location (including the benches and sea-view), works with a material that changes shape in interaction, and stimulates multiple senses (Chebotareva, 2017a).*

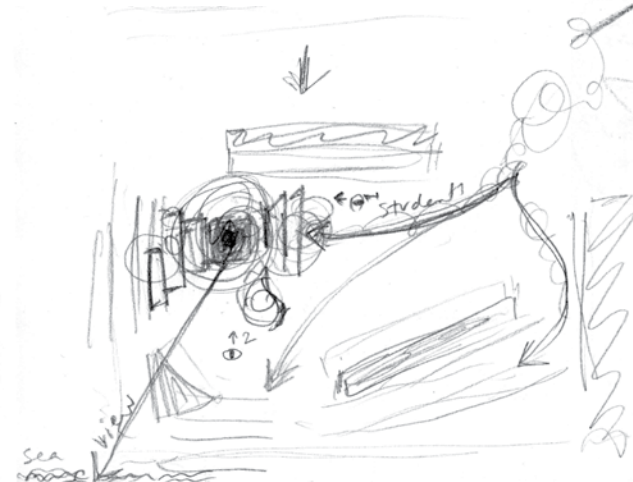
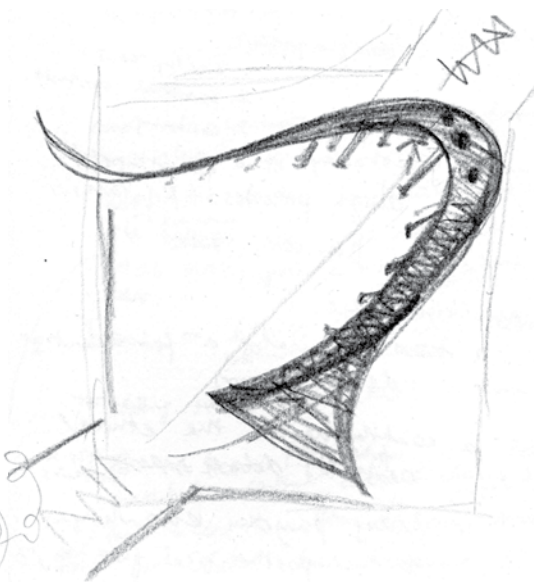
In my own exploration of these design criteria, in preparation for the workshop, I was particularly interested in a structure that would continue the existing stairs

to add an opportunity for climbing higher to gain a better sea view. This structure, I imagined, would connect to the existing benches to draw attention to them as an affordance for social activity, rather than an affordance for bike support. Being interested in materials that stimulate multisensory interactions, I explored textiles (for tactile interaction and interaction with wind) and wood and spices (for smell). During this exploration, I was



inspired by several precedent projects and made a few very rough sketches. Although I did not perform an in-depth analysis of the precedents, I include them here as the projects inevitably stayed with me in the continuation of the design process. My sketches are also intentionally very rough as it was intended that the students would design the installation – so although the design is not at all developed in the sketches, the idea of working with verticality (staircase and interactive wall) on the site stayed with me in the next phase of the design process.





OBSERVATIONS OF SITE –  
REGISTERING AFFORDANCES  
AND ATMOSPHERE

Just before the planned student workshop, and after the formulation of design criteria, I spent three days on-site to make in-depth observations

and register the affordances and atmosphere before an installation. The method for registering the affordances is based on observations of people-environment interactions on the site, whereas the method for registering the atmosphere is based on a walk with people around the site where the people are asked to express all their sensory and affective impressions. I decided to adapt the Commented City Walk method because I was interested in both before and after registrations of atmosphere (i.e. I would need to walk with the same people two times, which was difficult to arrange on short notice), and because there was little time since I also needed to spend several days on-site on my own for observing and registering affordances. I therefore decided to have a Commented City Walk by myself when approaching the site for each of the three days, and to note down any sensory and affective impressions I had on-site during the day. In this way, it was an autoethnographic registering of the atmosphere. Hence, my field notes from the site observations consist of registrations of sensations and feelings that I experienced on-site, and observations of people-environment interactions on-site.

The three days on-site, January 25, 30 and February 7, 2017, were cold and grey. There was clear weather on the first day, misty weather on the second and it was snowing on the third. I was on-site from around 8.30 each morning until around 18.00 in the evening, attempting to register the site throughout the day. I had originally intended to stay outside on the corner to observe people's interactions but realized already by the first day that this was not possible due to the cold weather conditions. I therefore observed from inside the school library, which was on the ground floor of the Nobelparken building, with windows facing the corner. This allowed me to observe people's interactions and gestures, but the feelings and sensations of the site could only be registered when I was outside, on my way to and from the site. I also spent approximately fifteen-minute breaks outside throughout the three days to capture the atmosphere. On the third day, I also decided to participate in the activity on the site, which consisted of walking quickly past the corner towards the road crossing, crossing the road, and continuing to the other university buildings on the opposite side of the road. On all three days I took some photos, but not too many, so that I wouldn't stand out during my observations.

My field notes are long and detailed, but because I was not able to use these observations for a before and after analysis (since the student workshop was cancelled), it is only parts of the field notes that remained relevant for me in my design process. These relevant parts are the registrations of my sensations and feelings on-site and of people's interactions that captured the mood and atmosphere of the corner. I conclude this section (and the first part of the design process) with the relevant extracts from my field notes (Chebotareva, 2017b) in a slightly edited version, for ease of reading. I do not attach any photos from my observations in order to convey the feeling and 'painting' of the

site drawn forth by my words. It is also the words, not the photos, that I used in my continued design process.

Coming to the site, seeing it from afar made me think of something unpleasant. No beauty, No attraction. When I arrive, it is empty. Then a large group of people arrives with the bus, all go through the location walking fast, determined, not looking around, not stopping, looking ahead, walking alone or in pairs. People avoid eye contact when walking past – not even looking at me as I sit on a bench in the square. Most people go diagonally across the square from the crossroads to the university. Many sounds from the road, but they are not overwhelming. Beeping sounds from the traffic light at the crossroads. Also hearing occasional seagulls. Truck noises.

Most people are alone. People walking in pairs are going slower than people walking alone. When going slower, people are likely to look up and around at either the crossroads or the windows to the library where I am now sitting. People are also walking faster on their way to university than out of university. People looking at mobile phones also walk slower, sometimes taking a break while standing.

My vision is filled with the grey asphalt of the road and the grey sky. As it gets darker, the lights from cars and streetlights dominate my vision field. The darker it gets, the more the corner completely disappears, and the big streets dominate.

A notable moment during the day is in the afternoon when a girl is trying to fix her bike in the middle of the square. She does this for a long time, around 20 minutes, and is clearly unsuccessful in her attempt. Many people pass her without even looking. Some do look, but do not ask her if she needs help. Only after around 15 minutes does someone ask her if she needs help, and then helps her. This episode summarizes the lack of interaction occurring at the square. It is a place people walk by quickly, determined, with no interactions.

As I was approaching on my way from the city, the wetness made the car sounds on the asphalt louder and more dominant in my impression on the square. It was very different to being in the city where the wetness did not have this effect because there are many fewer cars. However, after some time the loudness of car sounds became normal and faded from attention. Another thing I notice on my way to the square was the experience of the lessening of people and the growing number of cars. Again, when arriving at the location this feeling falls from attention – it is still there but I notice it less and focus more on observing the people that are there.

The square also disappears behind the big roads and big surrounding

buildings. The square only appears when crossing the ring road at the pedestrian crossing.

The first thing I see as I approach the corner today is a clear pattern in the trees of the square – they are framing the two paths people take on the square – the horizontal path cutting diagonally across the square and the path along the wall of the building. The benches have an angle that highlights these two paths. The diagonal path becomes especially clear when crossing at the traffic light. The trees also invite you to walk along the diagonal path. I imagine how nice it would be with a forest of trees through which you would have to make your own path through the square, making you aware of where to go. (Also, none of the buildings have any materials that interact with the weather, for instance, a copper roof that would look nice on the grey sky.)

Arriving early today, at 8.00 in the morning, I notice that the speed of people is significantly slower. When people are walking slowly, they look around themselves a lot more – up, to the sides – they do not only look down and in front of them. Some even make eye contact with me and smile to me through the window to the library. The body language of a slow walker is also different from that of a fast walker. Slow walkers have more open shoulders and a bit more uncertainty/openness in the direction of their walking, they waddle from side to side, and before entering doors they stop for a moment and orient themselves by looking around. When people walk fast, however, they just go through the door without the short stop and looking around. Their shoulders are more closed, they have a tense face looking straight ahead; they do not feel inviting to talk to, they are difficult to approach. As the time reaches 9.00 there are significantly more fast walkers, and the eye contact ceases. Fast walking, as on my first observation day, dominates the square until late afternoon.

Big groups of people fill the square at the same time following the arrival of buses at the bus stop. This is most prominent between 9.30 and 10.30. The big groups all walk horizontally across the square. Their similar speed and determination makes the group difficult to approach, and you feel as if you are in their way. The few that stop do so while looking at their phone; they keep standing, do not sit down, and then continue walking. Nobody gives each other more than one glance. A man walks by with a pipe – nobody seems to notice but me. A girl falls off her bike, nobody approaches to help, some only shed a glance at her, she stands back up on her own.

Time and movement: is the unidirectionality of cars on the road contributing to the unidirectionality of people movement on the square?

In the afternoon, I buy a coffee and sit outside at the square. I chose the bench with its back to the road and facing the square. Most people walk past me without looking at me. Of the many people, two women, both walking slowly and dreamily past me, make eye contact with me and smile. Another woman walks up to me and asks me if I am waiting for someone. As I say no, she retreats, and when I try to explain to her about the ethnographic study she shows a complete lack of interest. Car sounds behind my back are loud and unpleasant. It is unpleasant to stay sitting because of passing cars and the flow of (ignoring) people. Nobody else is sitting down. What if the cars did not make sounds? What if the roads were rivers? What if people greeted each other?

The square feels like an urban waiting room or corridor. Considering the short meetings that the square is used for and the constant flow of passers-by and the benches that invite us to walk past along the diagonal path rather than inviting us to sit down.

The snow stays on the ground where there is no salt. On the corner all the footsteps are visible in the snow – the paths of users. This adds a great dimension to the square. It becomes much more interesting to observe – both for me and for the other people. People walking past look down and cover their faces from the snow, but more people today are walking slower, and look around, up and down at the snow. For the first time during the observation days, the road is not the most visible thing – today it is the white carpet of the snow. The snow makes the air between the buildings visible – I realize that the (air) space above the crossroads is very big and usually invisible. The snow, inviting me to look up, also makes me realize that the wall on the other side of the crossroads is covered in green grass – before it blended in with the grey road, now it stands out.

As the sun comes out, I take a walk around the corner and crossroads. I cross to the other side following the flow of people going away from the corner. As upon my approach to the corner on all the other days, it is clear that the corner is nearly invisible from the other side of the road; it becomes visible only when crossing the big roads. It feels like a place to walk past to get away from the cars. It doesn't feel as a place in its own right.

In the three days of observations, I had shifted my attention from observing the corner in isolation from the roads to the relation between the corner and the crossroads. Whereas it was possible to register affordances by observing person-environment interactions at the corner (and to identify its features as I did on my first site visit), it was not possible to register the atmosphere at the corner without registering the atmosphere of the crossroads (its sounds, affect, color, air). With atmosphere having a central role in my theoretical framework, I decided to further explore this difference. In fact, my unexpected experience

of the atmospheric significance of the crossroads evoked the substance for my further design process. Understanding the relation between the corner and the crossroads – and, theoretically, between affordances and atmosphere – became the central aspect for the next phase in the design process.

#### ANALYSIS AND FIRST PRELIMINARY CONCLUSION

The beginning of my design process shows both the reactive and reflexive aspects of the design trajectory. This is particularly evident in determining the site for my research through design process. The site of the Nobelparken corner at the Nordre Ringgade-Randersvej crossroads was already decided upon for the student workshop that I was invited to organize. Then, after the workshop was cancelled, I decided to continue working with the site. In both cases, I reacted to unplanned events. In the first case, my decision to accept organizing the workshop and working on the site was based on my design tactic of collaborating with an architect (in this case, students in the workshop) and realizing an installation for a public space. My decision to continue working with the site was driven by my reflections and insights from my observations on-site. These observations were based on my design tactic of using theory. I used theory to organize my observations into registrations of affordances and atmosphere and, through this, identify general values in people's activity. My observations showed an interesting correlation between Anthropocene, atmosphere and affordances, marking the beginning of my concept generation and exploration. This gave input into my further design process.

My first site observation, which was based only on the method from the ecological theory of perception, showed that there were many affordances for social activity on the Nobelparken corner that were not perceived. For instance, there were benches that people walked past without interacting. This meant that there was a visible difference between the field and the landscape of affordances. I also noticed that there was a view of the sea from the corner, but there were no affordances for gazing at the sea. Following this line of thought, my first concept generation and working hypothesis was that, by creating an affordance for looking at the sea, all other affordances for social activity (the landscape of affordances) would be perceived and this would catalyze agency. This influenced my design exploration as I sketched an object that added height (to view the sea) and was connected to the existing benches. Furthermore, I concretized this abstract concept into a design goal for the students' workshop. My internal concept critique came from making more in-depth observations.

The in-depth site observations registered both the affordances and the atmosphere on-site by following an adapted version of the Commented City Walks method. These observations showed that the atmosphere of the corner extended beyond the crossroads. I identified the edge of the atmosphere along the approach on Nørregade. This meant that I could not work with the concept and design exploration on the corner without addressing the atmosphere of the crossroads. This resulted in a critique of my initial concept generation

(that addressed affordances *only* on the corner) and stimulated a new concept generation that explored a link between all three concepts – Anthropocene, atmosphere and affordances.

I explored a potential link between the three concepts with the design tactic of writing. I expressed my observations through narrative writing to capture my multisensory and affective experience (i.e. the atmosphere) of the corner. This narrative writing, in turn, gave rise to imaginative design thinking and generative metaphors. For instance, while making observations, I asked myself what if cars did not make sounds, what if roads were rivers, and whether the unidirectionality of the road creates the unidirectionality at the corner. The metaphor of roads as rivers (intuitively) linked two seemingly unrelated sites and was further explored in the next design phase. Furthermore, I imagined how materials could react with the weather (e.g. that it would be nice with a copper roof that would stand out on the grey sky). And, finally, imaginative and metaphoric thinking operationalized things I would normally overlook – the air above the crossroads is ‘big’, the corner ‘disappears’ behind the big roads and only ‘appears’ when crossing the road, it is possible to hear seagulls, etc. Although it was difficult to translate this concept exploration into a design idea, I concretized it by identifying a focus for design – the air above the crossroads and the seagulls. These metaphors and concretization, in turn, sensitized me to the Anthropocene entanglements on the crossroads and directed my conceptual analysis towards the impact of the atmosphere of the crossroads on the perception of affordances on the corner.

In conclusion, the beginning of my design process illustrates both how concepts influence a design process, and how a design process influences conceptual analysis (my research questions two and three). The concepts helped me to identify general values in the users’ behavior, understand and expand the site, and formulate a design direction. Design thinking and metaphors, in turn, stimulated conceptual analysis by focusing on materials that interacted with weather, the entanglements in the air above the crossroads and linking two seemingly unrelated sites. This interrelation between design thinking and concept analysis led to formulating two preliminary links between the concepts of atmosphere and affordances (research question one): First, that adding an affordance to invite people to have an aesthetic experience (e.g. looking at the sea) will change the perception of the existing affordances. Second, that the atmosphere of the corner and crossroads are the same. So, to explore if atmosphere affects the perception of affordances, the site should include the crossroads. Affordances of the corner cannot be addressed without addressing the atmosphere of the crossroads.

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## THE RIVERBANK

### From affordances and atmosphere to path design

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Taking off from the cancellation of the student workshop in February 2017, I began the first stage of the design process by revisiting my site observations. Especially poignant were the questions that I asked myself while observing, such as:

*Is the unidirectionality of cars on the road contributing to the unidirectionality of people movement on the square?*

*What if the cars did not make sounds? What if the roads were rivers? What if people greeted each other?*

These questions led me to explore the relation between atmospheres and affordances both theoretically and through design. I explored the connection theoretically by writing and submitting a manuscript to the scientific journal *Frontiers in Psychology*. I submitted the abstract in April 2017, the manuscript in August 2017, received a peer-review in November 2017, and submitted a revised manuscript in January 2018. Ultimately, I did not agree with all of the reviewers’ comments, and I decided to withdraw the article from publication. However, formulating the thoughts ignited by my observations of the corner and crossroads into a theoretical analysis and argument was an important part of the design process.

Concomitant to writing the manuscript, I continued to explore the relation between the corner and crossroads through design. My design exploration was strongly influenced by my research stay with architect Ariane Lourie Harrison at Harrison Atelier in New York in May 2017 and by my dialogue with architect Hiroshi Kato in the summer and fall of 2017. Harrison Atelier is specialized in post-humanism and design for multi-species. This influenced and informed my design exploration towards multisensory orientation and invisible matter. My collaboration with Hiroshi Kato began in July 2017. After the cancellation of the student workshop, I was looking for an architect to collaborate on the design and realization of my installation for Nobelparken because I had no prior technical training in architecture. Hiroshi Kato was interested in my project and theoretical explorations of atmosphere, and expressed an interest in collaborating. Our collaboration lasted until May 2018, continuing into the second stage of the design process. It ended before the third and conclusive stage of my design process; that is to say, before the design and realization of *Urban Carpet*. Ultimately, we failed to find a common design language and vision (and had conflicting schedules). Despite this, my dialogues with Hiroshi Kato influenced my design process, in particular, by helping me to understand

the Nobelparken site in its urban context and connecting my theoretical exploration to the site.

This first stage in the design process is characterized by the continuous dialogue between my design explorations and writing the manuscript for the *Frontiers in Psychology* journal. Accordingly, I have structured this section in two parts – first, the design and theoretical explorations around my research stay at Harrison Atelier, and, second, the design and theoretical explorations connected to my dialogue with Hiroshi Kato. Each part consists of quotes from my manuscript, design sketches, reference projects, and a reflection on the mutually enriching relation between the theoretical and design explorations. The development from the first part to the second is based on an internal evaluation of a speculative design proposal developed as a conclusion to my stay at Harrison Atelier. The second part of the design process does not have a clearly defined ending. However, in October 2017, I received external feedback for my project, especially my design exploration with Hiroshi Kato, at a PhD course at the University of Copenhagen, which marked a turning point in my formal exploration. I therefore conclude this section with this feedback. The turning point in the theoretical exploration came a little later, after January 2018. Until then, I worked on a revision of my manuscript for the *Frontiers in Psychology* journal. There is little difference in the theoretical idea and conceptual analysis between my original and revised manuscript; the difference is mainly in the number of references and clarity of argumentation. I therefore quote my revised manuscript throughout this section, although it was written after the conclusive external feedback for the design exploration of this stage.

#### HARRISON ATELIER AND DESIGNING THE SURFACE

Prior to arriving at Harrison atelier, I worked with understanding the relation between the corner and the crossroads

by organizing and analyzing my observations in relation to my theoretical framework. First of all, I noticed that the crossroads and corner seemed to share the same atmosphere. The border of an atmosphere is usually determined during the Commented City Walk – and, in my autobiographic version of this walk, I detected the same sensory and affective experiences as on the corner already during my approach to the corner along the main road, Nørrebrogade. The atmosphere of the corner, then, extended at least into the crossroads and, possibly, even further down the main road. During this analysis, I also noticed that the sounds that I heard from the crossroads seemed to influence my *motivation* to interact with the affordances on the corner. It also seemed that my mood was tintured by the affective tone of the crossroads. Could an atmosphere be understood as a motivation to explore the available affordances?

The theory of atmosphere does indeed argue that the tone of a place influences *how* things are done, and that an atmosphere might motivate a person to take certain actions that further enhance this atmosphere (this is, however, discussed in relation to desirable atmospheres, such as coziness – see, for instance, Linnet, 2012 and Bille, 2015). Hence, it was possible to assume that the crossroads

influenced the way people walked (at the same fast pace as when crossing the road) and motivated people to act in the same way on the corner (and therefore not sitting down on the benches or looking at the sea). However, the theory of atmosphere did not offer any perspectives on whether an atmosphere could change a person's perception of invitations for actions, nor did it offer any perspectives to how to change this without changing the whole atmosphere.

I continued this theoretical exploration in the ecological approach to perception, i.e. the theory of affordances. The theory of affordances makes a distinction between the field of affordances (the perceived and actualized affordances) and the landscape of affordances (all the available affordances). However, the factors that create a field of affordances are attributed to individual factors (personal experience, mood and skill) or socio-cultural context (making certain actions inappropriate). The role (or even existence) of an atmosphere is not considered, and design is often thought to contribute to maintaining a socio-cultural context, particularly through the design of objects with canonical affordances. My observations of the corner and crossroads could not be explained by either theory, but seemed to point towards a potential connection between the two theories: could atmosphere be an environmental factor that gives rise to a certain field of affordances and therefore motivates certain actions? I decided to explore this connection driven, in part, by a theoretical curiosity and, in part, in searching to find a way back to design. I found my way back to design through the concept of medium.

#### DESIGNING ALONG THE VERTICAL AXIS

To understand atmosphere as an environmental factor, I looked at the understanding of environment in the

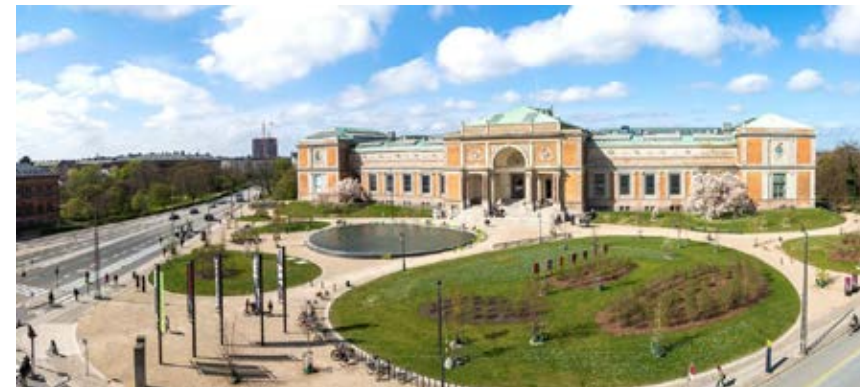
theory of affordances. Environment consists of the medium, substances and surfaces. The medium is the air through which everything is perceived – and it is in the medium that light, sound, heat and chemical waves move, being directed by the surfaces of substances, and ultimately being processed by the sensory organs of a person, leading to multisensory perception. The medium and, more broadly, environmental factors, are not a focus of research in ecological psychology. There is also no research on the perception of affordances at the border of two different socio-cultural contexts (such as the crossroads, where one behavior is appropriate, and the corner of a university, where another behavior is also appropriate). Just like the medium, atmosphere is the invisible air in-between objects. I therefore decided to focus my exploration on the concept of medium in the ecological theory of perception and formulated the following argumentation in my manuscript (Chebotareva, 2018a, p. 6).

Furthermore, Gibson (1986[1979]: 18) points out that movement of information in the medium is vertical, rather than horizontal, guided by gravity and the increase of air pressure towards the ground. This introduces an alternative axis to the understanding and design of landscapes. Landscapes, and places in general, are usually understood as a composition of visible elements on a horizontal

plane – for instance, a playground is often understood as a cluster of objects (slide, seesaw, monkey bars) often with of a small fence or change of surface (e.g. asphalt to sand) at its limits. The notion of medium adds a vertical axis to this understanding consisting of a cluster of invisible elements. Taking the example of a playground, it can also be understood as a cluster of sounds of children’s playful shouting, laughter and possible banging of objects with each other. In this case, the limits of the playground extend the limitation of a fence on the horizontal level. Without a separation by substances along the vertical axis, the elements of the medium move freely without a sharp transition. Thus, several places can share one medium. And the information carried in the medium of e.g. a tennis court next to the playground will be ‘tintured’ by the sounds of the playground. This was also the case at Nobelparken where the crossroad and public square shared one medium. If we understand information in the medium as the environmental factors affecting the perception of affordances, it follows that the solicitation of affordances in two different places that share one medium may be comparable – that is, the what of interactions will be different, but the how of interactions might be similar.

This very simple observation has a profound effect on landscape and architectural design, which is still today very object-oriented (Lukas, 2012). By taking into account the medium, the design focus shifts from the affordance in isolation to the affordance in a medium. This implies that design is no longer only concerned with creation of object(s) and transitions along the horizontal axis, but also must be concerned with the elements on the vertical axis and the creation of transitions between different mediums. Thus, the movement of sensory information in the medium around the object becomes just as important to take in account during a design process as are the object’s visual features.

My exploration and argumentation on the importance of medium led me to discover the ‘vertical axis’. I began exploring precedent projects that worked with the air along the vertical axis. The most significant precedent project I identified was the Blur Building by Diller Scofidio + Renfro, which gains its ever-changing form from the fog it creates along its vertical axis. I also explored the typology of corner buildings for comparative analysis. In particular, I looked at the SEB Bank in Copenhagen designed by Lundberg & Tranberg and SLA and the entrance to Statens Museum for Kunst (SMK) in Copenhagen designed by Polyform and Karren En Brands. Both of these buildings have a corner towards a large road crossing, making them comparable to the Nobelparken corner. Both corners had been designed within the past decade, and both work with the strategy of creating a green public space that separates the crossroads from the entrance to the building.



Both the corner of SEB Bank and the corner of SMK are designed as public green spaces. The public green space creates a transition between the crossroads and the building – the corner becomes a green boundary with its own atmosphere. While this undoubtedly creates multisensory interactions on the corner and stimulates social interactions, the corners do not interact with the atmosphere of the crossroads. This differs from the Blur Building, which takes in water from the lake on which it stands and transforms it into a fog that gives it its form. In this way, it visibly interacts with its surrounding medium (and atmosphere). Drawing inspiration from this, I wondered whether (and how) the Nobelparken buildings could visibly engage with (and potentially transform) the medium of the crossroads. In the development of my own sketches of the site, I began giving the crossroads (i.e. its medium and atmosphere) increasing significance, depicting the whole crossroads rather than the corner in isolation.



My increased interest in the crossroads and its medium and atmosphere through design was in part also driven by a more in-depth reading of the vertical axis of the site. In the process of precedent analysis, I revisited my site observations to identify elements along the vertical axis of the corner. Exhaust emissions from cars, snow, rain and seagulls stood out as interesting elements on the vertical axis. All these elements seemed to add texture to the air above the crossroads and corner: exhaust emissions added smells and rhythm (through the change in odor) to the air, snow made the air over the crossroads visible, rain made the asphalt wet and thereby changed the sounds of cars and color of the crossroads, and seagulls added bird sounds which disrupted the monotone soundscape of the traffic. Additional research on seagulls showed that birds use the heat from large road crossings for upsurge and tall buildings for an overview, just as they use cliffs in other environments. In particular, seeing Nobelparken as a habitat for the seagulls was interesting for me, as it highlighted the entangled relations between humans and other species and the complexity of urban nature.

What if the walls of Nobelparken were designed as cliffs – for people to climb on at the bottom to see the sea, and for birds to rest on at the top? Could working with the medium and atmosphere make people more aware of their coexistence with other species? Following this exploration of the vertical axis (and the resulting questions), I decided to work with a design strategy that would visually engage with the medium of the crossroads. Thus, I would not work with creating a separate atmosphere on the corner by making a multisensory boundary such as the SEB and SMK projects. With these atmospheric and post-humanist thoughts, and the decision to work with the medium of the crossroads, I arrived at Harrison Atelier.

## DESIGNING SENSORY GRADIENTS

Harrison Atelier specializes in architectural design for multiple species, specifically for birds and

bees. Their approach to designing for multiple species is based on post-humanism – that is to say, they work to support a coexistence between humans and nonhumans. For instance, they design façade enhancements as habitats for birds and bees that can be used on buildings in an urban context. I spent fourteen days working at the studio. During this time I was involved in their studio work, specifically, in developing a competition entry for a bird observation tower in Estonia. I was involved in the initial concept and design development. Working on the concept for the bird observation tower allowed me to explore my theoretical exploration of the link between affordances and atmosphere through architectural typology. Drawing on the idea of designing the medium around the object, rather than just an object, I suggested designing a collection of bird observation paths that extend into the landscape and come together as a ramp resembling an observation tower. This would both mediate people's motion in the surroundings and attune people to the atmosphere of observing birds already by their approach to the observation ramp tower. The idea of working with the approach and paths in the landscape was accepted by the team and the design was developed in the month after I left the studio. Because the design was developed after my stay at the studio, it was the discussions of the path typology that were important for my future design process.

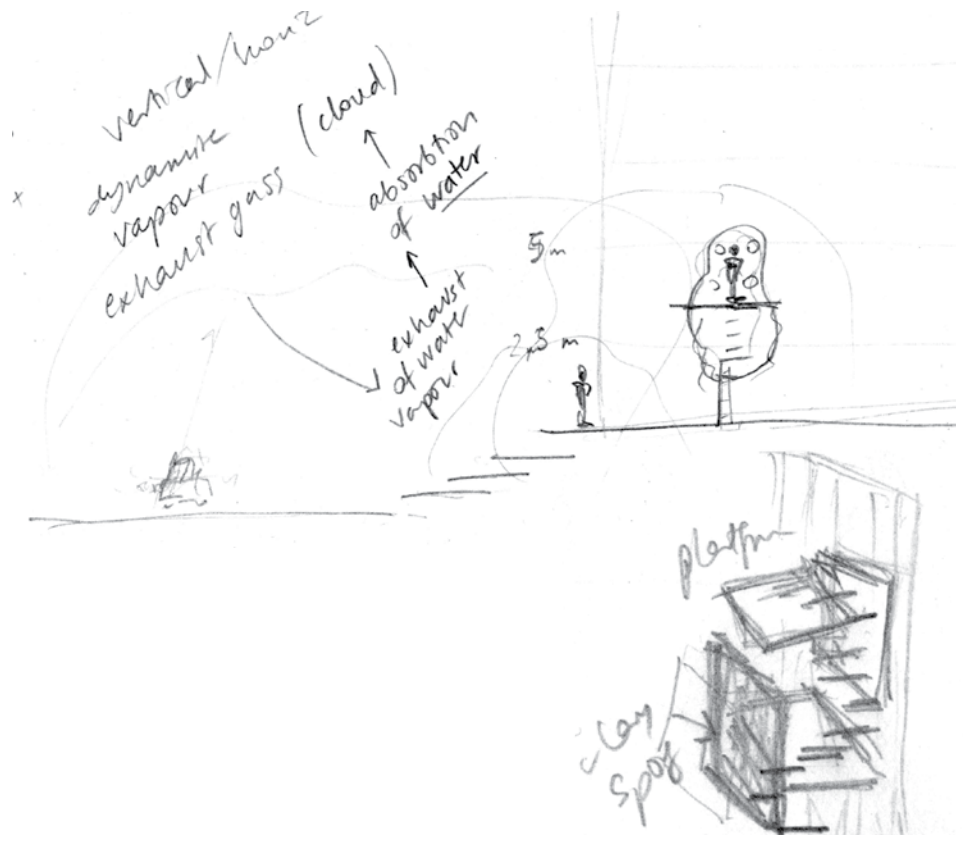
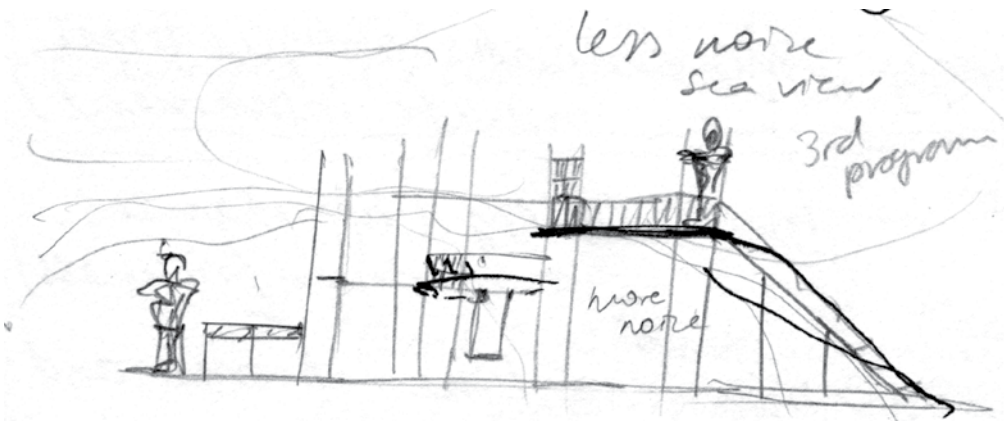


In discussions on path typologies, Ariane Harrison pointed out that paths support the multisensory orientation in space used by animals (and, according to ecological theory of perception, also by people). As Ariane Harrison explained, it is very difficult to attract bees and birds to new objects (even if the objects are specifically designed for them) because they tend to avoid changes in their surroundings. By integrating the new object into the surroundings through paths, the architecture acts as a beacon. The architectural object is extended to attain several sensory thresholds that allow for the gradual adaptation of

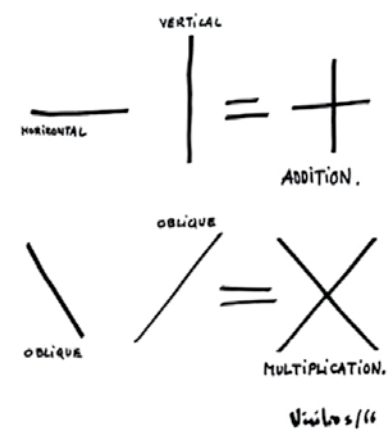




sensory orientation for all species. The idea of the extension of the architectural object through sensory thresholds was also a central theme in the feedback that I received from Ariane Harrison on my design ideas for the Nobelparken corner. By working with the vertical axis on the corner, I extended the walls of Nobelparken and added sensory thresholds to them. In addition, Ariane Harrison suggested that instead of adding verticality to a new object for the site (such as a staircase or bench), I could work with the height already present in the buildings of the Nobelparken. That is to say, I could extend their walls with a façade enhancement that interacted with the medium. The feedback and design ideas of extending the Nobelparken walls are reflected in my notebook sketches.



In the feedback, Ariane Harrison made many references to other projects, some of which I was not familiar with. There were in particular three projects that stood out and became influential in my continued design process. These are the 'Ethics of Dust' by Jorge Otero Pailos, where the surface of a building is covered with a coating that collects dust and, after some time, can be peeled off to reveal the dust; the 'Museums in the City' by David Gissen, where museum lighting is applied to overlooked aspects of the cities (the so-called subnatures, such as large roads) to signal their importance; the oblique forms of Architecture Principe and the perforated floors of Arakawa and Gins that activate people and stimulate continuous movement by working with an uncomfortable surface.



The four projects are in many ways far removed from the specific context of creating an installation for the Nobelparken corner – Museums of the City is a conceptual project based on renderings, The Ethics of Dust is a project for exhibitions in museums, the perforated floors of Arakawa & Gins is a highly experimental private residence, and the potential of oblique forms is a theoretical project by Architecture Principe. But the ideas of working with a material that collects the invisible matter of the crossroads, of drawing attention to the overlooked crossroads, and of creating an uncomfortable surface to activate people when walking, became key directions in stages two and three of my design process. My time at Harrison Atelier also directed my design exploration towards a path typology. Although I began my design process with the idea of verticality at the corner, I realized, after working on the bird observation tower, that there was a great potential in working with the approach towards the corner. Namely, I envisaged an installation that creates sensory thresholds on the crossroads itself.

I began exploring this design idea upon returning to Denmark. In a first exploration, I made a speculative design where the surface of the crossroads itself is changed from asphalt to brick. I chose brick because the university buildings on the corners of the crossroads are all made from this material. The idea was to extend the corners onto the crossroads through materiality and, thereby, show that they share an atmosphere. Also, this change of the surface would impact the soundscape of the crossroads because cars driving over bricks sound different than cars driving over asphalt. And, potentially, the changed soundscape would influence the approach to the corner. I did this design test as a simple photoshop manipulation with help from Jennie Schneider, who at the time was a student at the Aarhus School of Architecture.



Working on this first design exploration strengthened my interest in designing an installation for the crossroads rather than the corner. However, the design idea itself was not interesting because it did not interact with and make visible the medium and atmosphere of the crossroads (only contributing to a change in sound of the traffic). And, most importantly, it did not create any sensory thresholds or a path, so the approach to the corner remained largely unchanged. I continued to work with the idea of sensory thresholds along the approach to the crossroads in the next part of the design process with Hiroshi Kato.

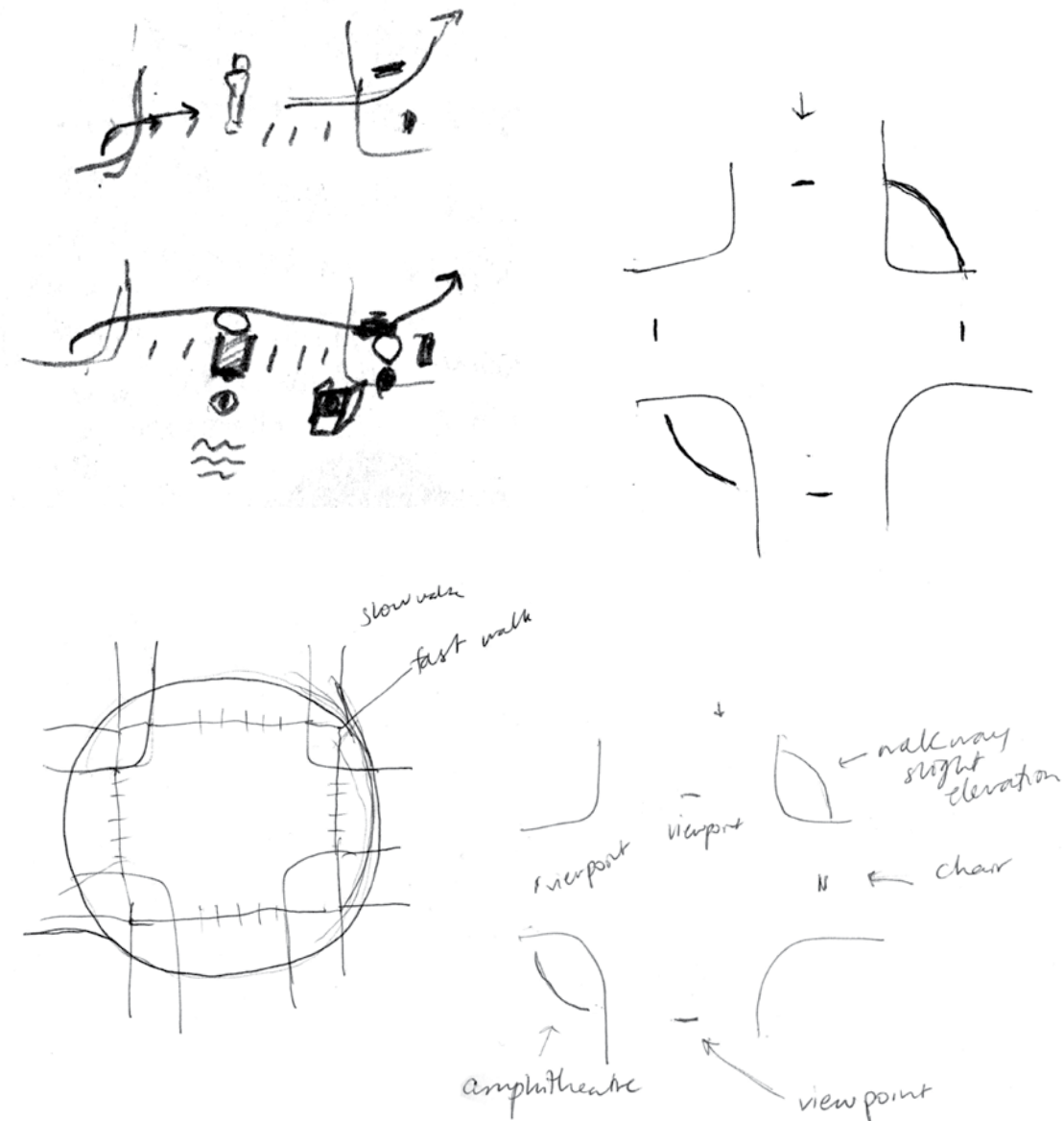
#### HIROSHI KATO AND DESIGNING THE RIVERBANK

I began the collaboration with Hiroshi Kato with a design vision of creating a path around the crossroads. My idea was to extend the project site from the corner to the crossroads and design sensory thresholds on the approach to the corner of Nobelparken. My vision was that the installation would be experienced on the way across the road to the corner, but that its effect would be seen on the corner. That is to say, I envisioned that the sensory experience on the crossroads would activate the senses and motivate an exploration of the existing affordances on the corner. I did not have a specific design idea for this vision and I was still influenced by my explorations of designing along the vertical axis and using materials that interacted with the invisible matter of the crossroads. Hiroshi Kato and I began our collaboration with a common site visit in July 2017. In my own site analysis, during the spring of 2017, I was focused on understanding the sensory and affective experience of the site and the perceived invitations for actions. My site visit with Hiroshi Kato, on the other hand, was focused on understanding my design vision in relation to site, and on analyzing the site in its urban context.

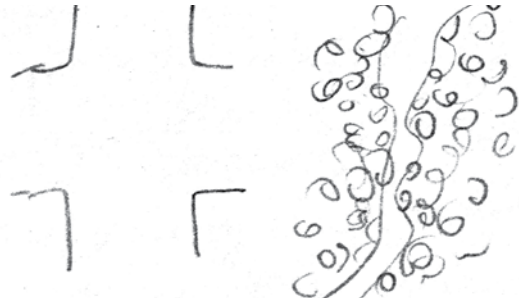
Our site visit began by exploring the corner at Nobelparken and, in particular, the walls, to find opportunities for working with verticality. However, we quickly shifted our attention to the crossroads itself. This was in part because the walls were difficult to activate with design – they were behind trees and not that visible on the approach, and there were windows, an art installation and the university logo, thus giving little space to work with for an installation. However, primarily, our shift in attention was caused by spending time in the crossroads while we were exploring possibilities for working on a path typology. Walking slowly across the pedestrian crossing and waiting in the middle of the crossing on the pedestrian islands gave us a very strong affective experience. The cars, the sounds, the speed and the sheer expanse of the space coming together in one singular experience was truly impressive. Furthermore, we realized just how many (18 in total) pedestrian islands there were in the road crossing, that they were all quite large in size, and that the view to the sea was even better from the islands in the middle of the road than from the corner. This led us to identify the traffic islands as a possible site for design.



Furthermore, while walking around the crossroads, we spent time on all four corners of the crossroads. Walking from corner to pedestrian island to corner formed a type of path around the crossroads. We therefore also identified the three other corners of the crossroads as a potential site for an installation. Early sketches of this 'path' are depicted in my notebook.



We finished our site visit by taking a different way home. Instead of walking back along the large Nørregade road (as I had done in all my site visits), we walked through Universitetsparken of Aarhus University – a green park in the old university campus, running along the length of Nørregade and protected from the atmosphere of the road with the walls of the Aarhus University buildings. Hiroshi Kato suggested walking this way to understand the site in relation to the urban context. Universitetsparken had a completely different atmosphere to the crossroads and Nobelparken corner. It was, as with many parks, relaxing and appealing to sit down and spend time there. There was a small stream flowing through it and a green amphitheater. The asphalted paths in Universitetsparken were curved and rolling, in contrast to the straight paths and stairs of the corner of Nobelparken and the crossroads.



The contrasting landscapes seemed to correlate with the contrasting atmospheres (and perceived affordances) in the two locations. The hilly, green and curvy landscape of the park invited the opportunity for slow walking and an exploration of the available affordances, while the straight, asphalted landscape with stairs of the Nobelparken corner invited fast walking with no exploration. This difference between the two sites resulted in different patterns of behavior. In Universitetsparken, people showed explorative behavior of the ‘classic’ elements of nature such as water and grass. However, in Nobelparken, people walked quickly without exploring the subnatures on the crossroads such as exhaust fumes, heat and seagulls. Although it would not be possible to change the soundscape at the crossroads, I wondered if our installation could introduce some of the landscape elements (curvy paths) on the crossroads. That is to say, I returned with new insight into the question I originally asked while making observations on the corner in January 2017: *What if the roads were rivers?* Then, I reasoned inspired by the Universitetsparken landscape, we would design a walking bridge over the ‘river’ or some ‘stepping stones’ to stimulate exploration of the ‘river’. Usually people stand in the middle of a bridge and look down upon a river – could the installation at the crossroads invite (and motivate) people to stand in the middle of the pedestrian crossing and look down upon the road? I continued to explore these questions and the metaphor of a riverbank by revisiting my theoretical exploration and making visualizations with Hiroshi Kato.

## SHARED REGIMES OF ATTENTION

The comparison between the green park of Universitetsparken and the road crossing at Nobelparken compelled me to revisit my original theoretical assumption that atmosphere, understood as an environmental factor giving rise to a certain field of affordances, was to be explored through the concept of a medium. Surely it was more than sensory phenomena that differed between a riverbank and a crossroads. For, even if the mediums (smells, temperature, humidity, sounds, light array, etc.) of the two sites were switched without changing anything else, it is unlikely that people would start walking slowly, exploring the crossroads and looking down the roads. Of course, this is both technically impossible and theoretically incorrect (because the medium is dependent on the substances and surfaces, so switching the medium would also necessitate switching these), but this thought experiment urged me to explore another connection between atmosphere and affordances.

Thinking back to my site visit with Hiroshi Kato, I realized that the crossroads experience held a perceptual paradox – although it was a very strong affective experience, it was very difficult to bring it to attention. I had walked past the crossroads many times since my first site visit to Nobelparken. But it was only when I shifted my attention from the corner to the crossroads that it became a spatial and affective experience in itself. Specifically, I felt that only by consciously shifting my attention to the crossroads and walking slowly around it, could I experience the crossroads as a sensory and affective totality. That is to say, I could have an aesthetic experience of the crossroads (following the definition of aesthetic experience by John Dewey, 2005 [1934]) only by breaking the habitual way of behaving. This made me wonder whether the atmosphere of the crossroads affected people’s actions and attention in such a way that the crossroads itself slipped out of awareness. Furthermore, could bringing an atmosphere into conscious attention (and, thus, having an aesthetic experience) stimulate an exploration of the available affordances?

Both research on atmosphere and on ambiance argues that the atmosphere/ambiance is perceived and affects people subconsciously. Furthermore, ambiance research, which is more focused on perception and the social situation, also argues that an ambiance is the specific rhythm (in actions, gestures and sensory information) of a situation (Thibaud, 2015) and that an ambiance only becomes consciously perceived by disrupting this rhythm by acting inappropriately (Roquet, 2016). The theories of atmosphere and ambiance, then, do not speak directly of attention. However, they stress that ambiance is connected to the whole social situation, not only to its sensory information, and that situationally inappropriate behavior can bring the ambiance to awareness.

In order to gain a better understanding of how an ambiance might impact attention and perception of affordances, I looked at the understanding of a social situation and situationally appropriate behavior in ecological psychology. A social situation (also referred to as a behavior setting and socio-cultural context) can be understood as a shared regime of attention – that is to say, people

in a situation all perceive the same field of affordances and their attention is therefore drawn only to some of the available affordances (Ramstead, Vassiere & Kirmayer, 2016). Because all people perceive the same affordances, they also behave in the same manner, leading to situationally dominant behavior that, with time, becomes considered to be appropriate. Such situations and regimes of shared attention lead to the development of habitual behavior and become institutionalized through the design of canonical affordances and organizational structures. One example of this is the classroom, where some behavior is clearly inappropriate. Another example could very well be the pedestrian road crossing. Furthermore, ecological psychology argues that learning to perceive and interact with new affordances is a process of educating one's attention – that is to say, learning to pay attention to novel aspects in the environment (Rietveld & Kiverstein, 2014). However, ecological psychology does not have any research on environmental (sensory and affective) factors that constitute and maintain a shared regime of attention. So, whereas I was first interested in atmosphere as a sensory phenomenon and explored it in relation to the concept of medium in the first part of this design process, I now explored atmosphere as an environmental factor that affects attention and maintains a shared regime of attention. Could this be the link between the theory of affordances and the theory of atmosphere? My theoretical exploration is summarized in the following passage of my manuscript for *Frontiers in Psychology* (Chebotareva, 2018a, p. 9).

Applying terms from ecological psychology presented earlier in this article, the ambience of a situation can be understood as a field of affordances that is shared among multiple individuals. The ambience of a situation directs attention to sensory information in the medium and creates a shared intentionality, thus soliciting behavior that further enhances the ambience. It is perceived as a uniting and connecting quality of the environment. However, there is an important difference between the shared regimes of attention and intentionality created by cultural affordances (Ramstead et al., 2016) and by the ambience of a situation. The ambience of a situation does not solicit what to do, but rather how one should do it. Thereby it creates a homogeneity of gestures – or, the affective expression of actions. One can say that it tinctures all individual-environment interactions with the same expressive quality. Following, it also tinctures all self-perceptions with the same affective quality. This affective quality cannot be understood as a single emotion, but rather as a complex affective state – such as e.g. 'sense of loss of time' (Bille, 2015). Furthermore, by soliciting a specific way of doing things, it is possible to conceive that an ambience can also either instigate or deter individual exploration of the environment. So, if an ambience solicits to walk with buoyancy it is likely that the individual will be more playful and explore alternative possibilities for action. However, if an ambience solicits to walk with determination, it is likely that very few alternative possibilities for action will be explored. Therefore, it can be considered an environmental factor influencing

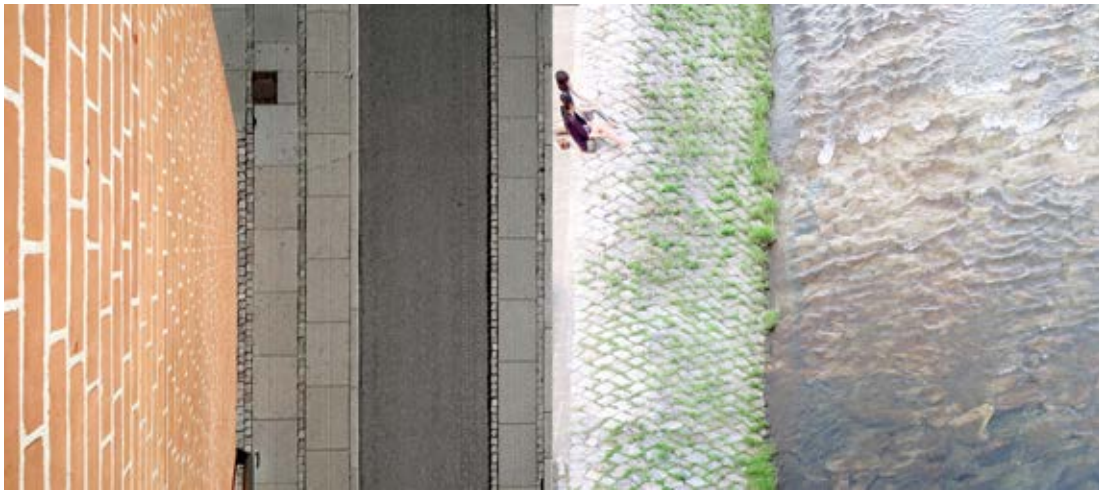
the agency of an individual in a situation. The influence of ambience on agency can nuance the discussion of ecological agency (Withagen et al., 2017) and also the ecological understanding of the value of landscape aesthetics (Heft, 2010).

Following this theoretical exploration, I arrived at the following working hypothesis. The atmosphere of a site is not 'only' the medium and sensory phenomena, rather, it is the shared attention towards certain sensory phenomena in the medium. This shared attention impacts how to perform an action, and this manner of expression is what gives rise to the affective state of a social situation. This affective state can then either motivate or hinder people to explore new affordances and ways of behaving in this situation. Therefore, linking this to my comparison of the green park at Universitetsparken with the road crossing at Nobelparken could mean that the ambience of the riverbank in the park solicits people to walk with buoyancy and explore new affordances, while the ambience of a road crossing solicits people to walk with determination and hinders exploration of new affordances. By preventing the exploration of new affordances, the ambience of the road crossing (and corner at Nobelparken) diminishes people's agency. Could drawing attention to other sensory phenomena of the crossroads, then, disrupt the shared regime of attention and motivate people to explore new affordances, thereby empowering people's agency?

Applying this to design, I reasoned, would mean that it is not only important to make separations and transitions between different mediums (sensory thresholds), but also to direct people's attention to other sensory phenomena at the crossroads. That is to say, I envisaged an installation that breaks the shared regime of attention maintained by the ambience by drawing attention to other sensory phenomena, thereby stimulating situationally inappropriate behavior that brings the ambience to awareness. The design exploration in this part of the process therefore became focused on how to direct attention to sensory phenomena.

#### VISUALIZING THE ROAD AS A RIVERBANK

My design process continued in dialogue with Hiroshi Kato. Following our site visit and my theoretical exploration we met two times in late August and September 2017 (and then again three times in stage two of the design process, described in the next section of this chapter). Our meeting and dialogue were guided by the metaphor of the riverbank. During our two meetings, Hiroshi Kato visualized this metaphor through photo manipulation, and his visualizations helped us connect my theoretical exploration to the Nobelparken site. The riverbank metaphor became a mediator between theory, site and design, and guided our discussion of the design vision in relation to the site. Our collaboration did not actually result in the design of an installation, but the visualizations stimulated my design exploration. Hiroshi Kato produced three such visualizations.

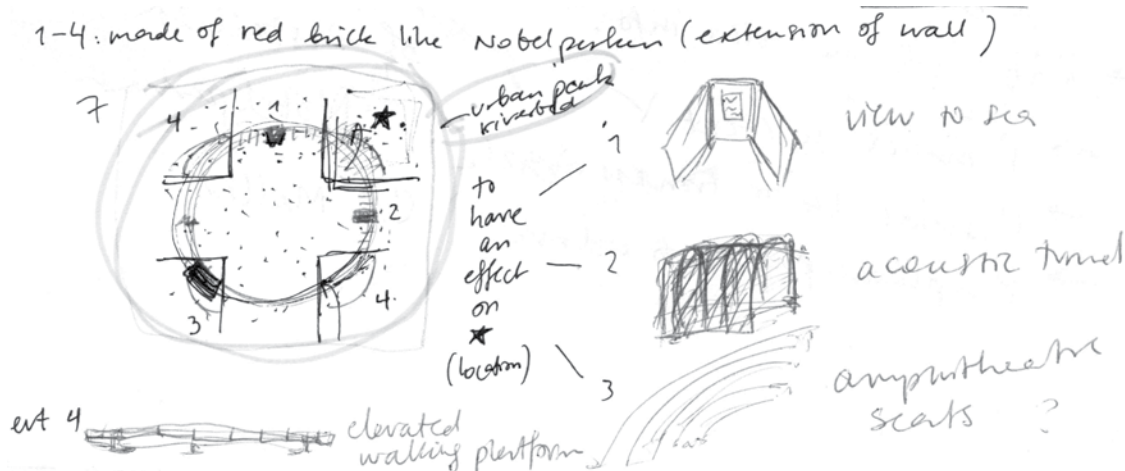


In the first image Hiroshi Kato interpreted my first theoretical idea that the atmosphere at the crossroads is a medium filled with exhaust fumes, speed, heat and sounds from traffic. In Kato's manipulation of an ancient Japanese painting, the clouds (air) are replaced with cars. Furthermore, the visualization depicts a bridge through the car-filled air. The second and third image are manipulations of photos from our site visit at Nobelparken. In these images, the main road is replaced by water and the bike path is turned into a riverbank where people sit and rest. These three visualizations did not depict or contribute to developing specific design ideas, but they visually highlighted my theoretical assumption that the atmosphere influences people's attention and the *how* of their actions. This is particularly evident in the second and third visualization. The people in Kato's photo manipulations are lying on the riverbank at the exact location of the bus stop on the Nobelparken site, a place where people normally sit and wait for the bus. In the visualization, Kato changed the affective expression of people's sitting without changing their behavior. Thus, people are sitting in a relaxed manner and talking to each other in the visualization in line with the imagined relaxed atmosphere of the riverbank. Kato also changed the surface of the bike path from asphalt to cobblestones and grass. This change implies that the tactility of the surface is an important aspect of changing how an action is performed. Furthermore, the people on the visualizations are looking at the road itself, while the people on-site at Nobelparken were looking at the traffic light/pedestrian crossing, their mobile phones, their bike or the bus.

These visualizations helped us to formulate some design directions. Our installation would motivate people to walk slowly, sit in a relaxed way, and look at the road, and not the traffic light (or some other action-related object). We continued to work with a site distributed between the corners of the crossroads and the pedestrian islands. I was particularly interested in working with the corner diagonally across from the corner of Nobelparken, and the traffic islands in the middle of the two pedestrian crossings to and from the corner of Nobelparken – on the crossing over Randersvej (from this island there was a sea view) and on the crossing over Nordre Ringgade. I identified these two traffic islands as important because they were directly on the approach to the corner across the road. Thus, the installation would give a sensory experience and invite people to walk slowly on their way to the corner. The corner diagonally across from the Nobelparken corner was interesting because it was part of Universitetsparken and there were more people on that corner than any of the other three corners. Also, from this corner, both the crossroads and the Nobelparken corner were in direct visibility. This made the corner a good site for inviting people to sit in a relaxed manner and look at the road without compromising safety (inviting people to sit in the middle of the crossroads would have clearly been dangerous).

For the corner, I worked with the idea of an amphitheater-like construction for sitting and looking at the crossroads and the Nobelparken corner. The construction drew inspiration from the green amphitheater seats in the Universitetsparken (that I photographed on the site visit) and invited an opportunity for relaxed sitting in a safe location. For the traffic island on the

pedestrian crossing across Randervej, I worked with an idea of framing the view to the sea by creating a three-wall structure with a window isolating the view to the sea. And for the traffic island on the pedestrian crossing across Nordre Ringgade, I had an idea of creating a sound-isolated tunnel that people would pass through. The change in sound before, during and after walking through the tunnel would draw people's attention to the soundscape of the crossroads, I imagined. These ideas are depicted in the sketches in my notebooks.



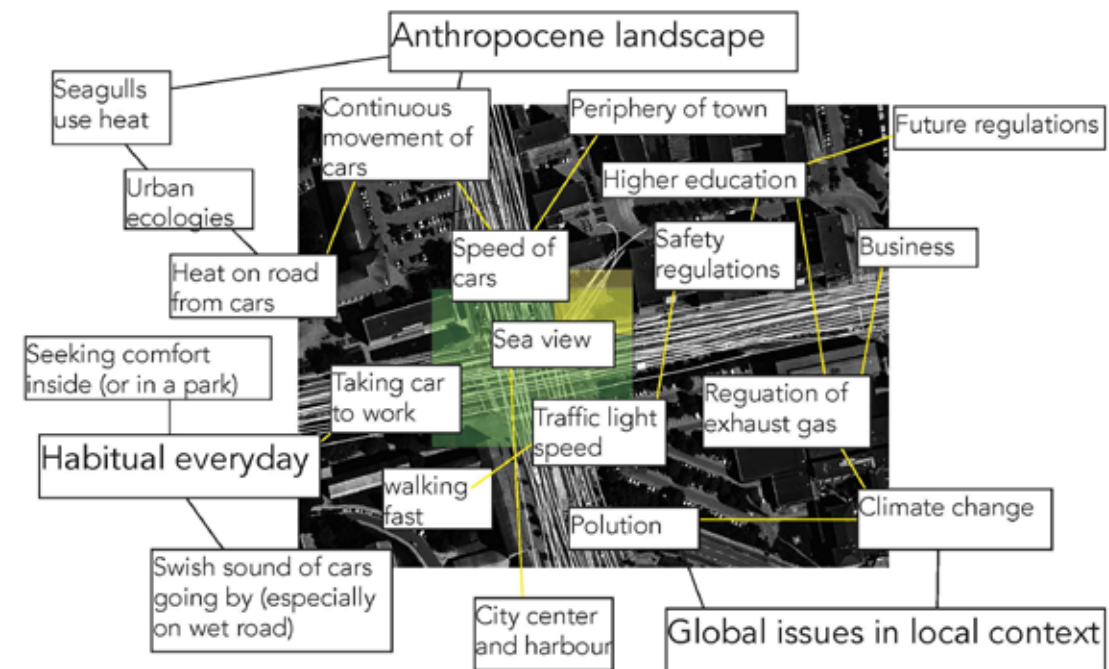
These design ideas were a good start for exploring a path typology around the crossroads. However, they seemed disconnected from each other (three individual installations rather than one, path-based installation) which meant that they would not give people one, singular, aesthetic experience (like the experience I

had of the crossroads during my site visit with Hiroshi Kato). Also, although the installations invited people to sit in a relaxed manner and, most likely, to walk a bit slower, they did not visibly engage with the invisible matter of the crossroads or draw people's attention to the ambiance of the crossroads. The framed sea view drew attention away from the crossroads and the sound tunnel disrupted the soundscape for a moment. In this way, both installations drew attention away from the ambiance for a moment (and in this way disrupted the shared regime of attention) but they did not draw attention to the ambiance of the crossroads directly. That is to say, they did not interact with the air full of cars depicted in Hiroshi Kato's first visualization.

I therefore decided not to develop these design ideas further, and to continue working with a path around the crossroads in a slightly different direction: the installation, on the corner and the traffic islands, would disrupt the shared regime of attention by drawing attention to the ambiance of the crossroads through a materiality that visibly interacted with the invisible matter of the medium. I continued the design exploration with this direction in the next

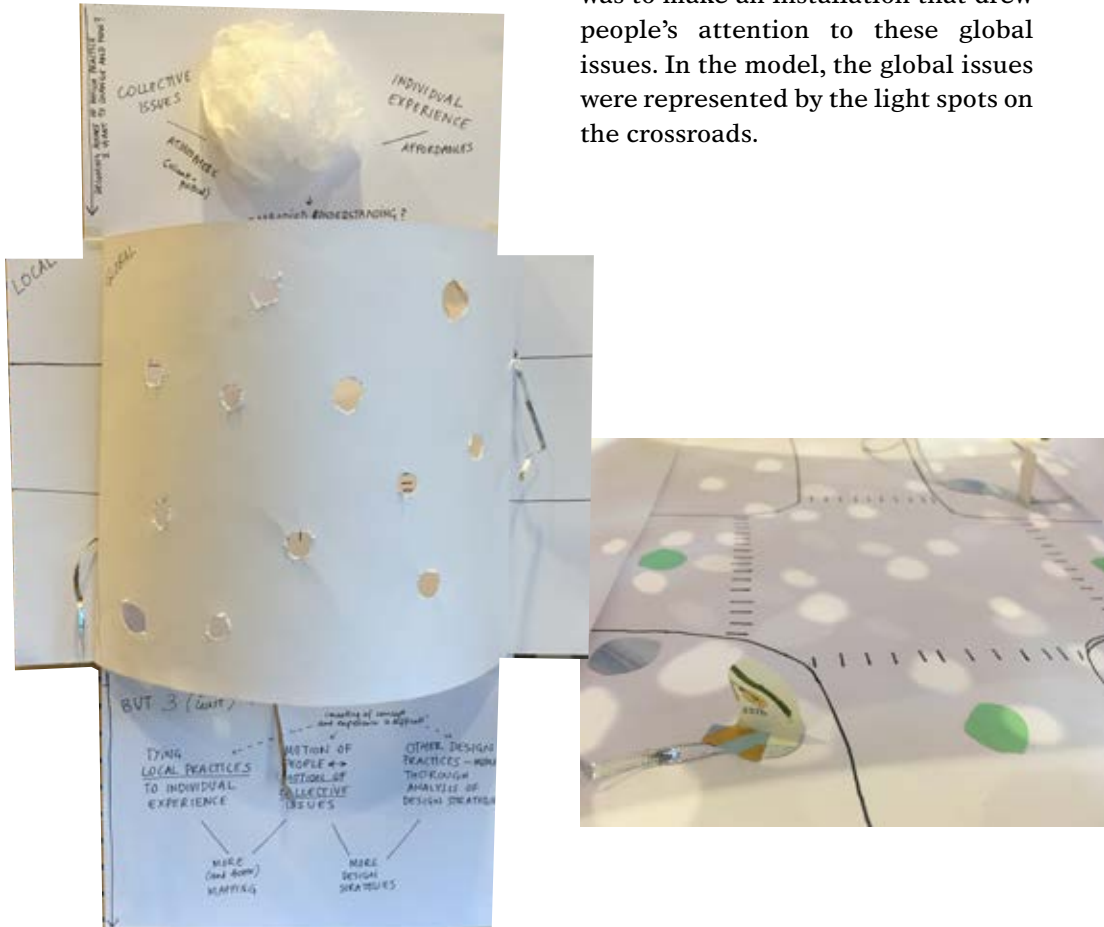
design stage. As a transition to the next stage in the design process, and as an external evaluation of my design exploration in the first stage, I participated in a conference organized by Walter Unterrainer, at the time Professor MSO at the Aarhus School of Architecture, and a PhD course organized by Peter Connolly at the University of Copenhagen.

The conference did not give any specific feedback or critique to my project. However, to present my site analysis of Nobelparken, I made a mapping. This mapping, although graphically unremarkable and simplifying my analysis, connected my affective and sensory experiences on-site with the socio-political situation of the crossroads. For instance, the fast speed of walking was connected to the safety regulations, which was connected to research in universities (Nobelparken being a university campus), which was also connected to regulations concerning exhaust fumes and climate change. The mapping connected global issues to the local context and, following arguments by Latour (2016) and Morton (2010), illustrated that global issues are all around us (especially on the crossroads), but are overlooked in our habitual behavior of taking the car and walking fast across the road. This mapping triggered me to understand and articulate the site as an Anthropocene landscape, an articulation that became a key driver in my next design stage. Furthermore, it made me realize that the consequence of the shared regime of attention (and ambiance) of the crossroads is a de-sensitization to global issues. Realizing this, I recalled the very first question of this thesis – could frictional encounters indeed change the world by disrupting the regimes of attention and drawing people's attention to global issues? Although perhaps going a bit too far, in the next design stage, I continued to theoretically explore the significance of linking ambiance and affordances in relation to the Anthropocene.



I presented my project and these thoughts at the PhD course at the University of Copenhagen. During the course we were also asked to make a very rough model of our project in three hours. The point of the exercise was not to make a precise model of a prototype or design, but rather to make a physical illustration of the project ideas to stimulate dialogue and discussion of the project. In my model, I attempted to visualize how the global issues in the air above the crossroads are also present on one's path across the road. That is to say, people walk through the global issues on their way across the road but, due to their habitual fast pace, do not notice the issues. The revised vision for my installation

was to make an installation that drew people's attention to these global issues. In the model, the global issues were represented by the light spots on the crossroads.



The model, despite its simplicity, shifted focus away from affordances, the medium and sensory thresholds and people's behavior on the corner, to highlight the abstract and invisible socio-political aspect of the site. At the course, however, my project was critiqued for having a gap between my proposed path design and the very abstract issues that I wanted to address. Would it really be enough to sit and look at the crossroads on the amphitheater-like construction to become aware of the invisible Anthropocene landscape? Is drawing inspiration from a riverbank metaphor enough to stimulate critical awareness? With these questions and critique, and with a new attention to the concept of the Anthropocene, I began the next stage in the design process.

## ANALYSIS AND SECOND PRELIMINARY CONCLUSION

Stage one of my design process is characterized by a reflective back and forth exchange between my design

tactics of writing and collaborating with an architect. I wrote a manuscript for a scientific article concurrently with exploring designs for the Nobelparken site. Both processes generated concepts for understanding how the atmosphere of the crossroads affects the perception of affordances on the Nobelparken corner, and how this can be expressed through design. The concepts derived from writing an article were based on the theories of affordances and atmosphere. The concepts derived from my collaborators, on the other hand, were based on the prior design work of the architects and on the identification of restrictions and possibilities on-site. The concepts in these processes were different, but they reinforced each other through my reflection. By integrating concepts from praxis in my reflection, I was reacting to the events and encounters in my design trajectory. Writing an article gave me an opportunity to analyze, contextualize and bridge my observations from site visits, insights from praxis and the concepts from theories. The design explorations gave me an opportunity to express this analysis in an installation. The conceptual and design explorations took place in two parts.

The first part theoretically contextualized my observations from the site visits in the previous part of my design and formulated concepts for design (medium and vertical axis) that were explored with Ariane Harrison. This design exploration was reactive to the current project at Harrison Atelier – designing a bird observatory. Sketching out this project led me to identify a path typology and the concept of sensory thresholds. Furthermore, Ariane Harrison suggested that I work with the surface of the walls of Nobelparken instead of designing an object for the corner. By working with materials that interacted with the air, I could design sensory thresholds on the walls. Returning to the site, I identified a challenge in working with the walls (because of windows and logo). I reacted to this by focusing on sensory thresholds along the horizontal axis – on the surface of the sidewalk. This exploration led to the formulation of the hypothesis that atmosphere is an environmental factor that gives rise to a certain field of affordances and therefore motivates certain actions. Materials that interacted with these environmental factors could expose the landscape of affordances and, thereby, stimulate exploration. The first exploration concluded with visualizing a design idea – changing the surface of the crossroads from asphalt to brick. However, this idea was abandoned after a reflective process of internal validation, in which I found that the design did not express the theoretical assumptions (it did not interact with the medium or create sensory thresholds).

In the second part of the explorations, I used article writing to formulate new concepts for design exploration (shared regime of attention and habitual behavior) and nuancing the hypothesis. My revised hypothesis was that ambiance maintains a shared regime of attention by directing attention to only a small selection of available sensory phenomena. Following this understanding, by directing attention to other sensory phenomena on the approach to an



affordance, an installation could stimulate a shift in attention and expose the landscape of affordances. This might motivate explorative behavior and the perception of new affordances. I explored these concepts and the hypothesis with Hiroshi Kato. Our exploration was reactive to our experiences on the site, especially to my experience of being in the middle of the crossroads and spending time on the traffic islands. I realized that the affordances on the corner of Nobelparken are approached by crossing the road. And that people walk past the traffic islands on this approach. Furthermore, spending time on the traffic islands brought the atmosphere of the crossroads to my awareness. I therefore reasoned that an installation that would stimulate people to spend time on the traffic islands could have the same effect. Thus, I identified the traffic islands as a site for the design of an installation. Accordingly, I used the design tactic of metaphor to communicate visually the logic of my analysis to Hiroshi Kato. I used the metaphor of the road as a riverbank to link the sensory experience at a riverbank with the situation of crossing the road. The design exploration ended with an idea for three smaller installations – a framed view and sound-isolating tunnel on two of the traffic islands and an amphitheater on one of the corners. This design idea was abandoned after an external validation found that it did not express the theoretical assumptions. However, the identification of a new site and use of metaphor capture the essence of my conceptually driven research through design process.

Identifying the traffic islands as a site for design exploration pushed the logic of the physical conditions of the project. This was made possible by using theory as a design tactic. Through conceptual analysis, I identified that it was important to bring the ambiance to awareness of the approach to an affordance in order to stimulate agency. This would expose the landscape of affordances and stimulate explorative behavior. Thus, I identified ‘the approach to an affordance’ as an abstract site for my research. To explore this conceptual analysis through design, I needed to locate the abstract site in real life. Following this, I looked at how people approached the affordances on the corner of Nobelparken. This happened when crossing the road and walking past traffic islands. Consequently, I identified the traffic islands as a site for my design exploration. In this way, my conceptually driven site analysis surpassed all considerations of functionality, programming and people’s current needs. Instead, it identified a potential future activity – becoming aware of the ambiance of a crossroads. Furthermore, my identification of an abstract site makes it possible and relevant to continue my research project in the future in other locations. For instance, this could entail identifying the approach to an affordance on a playground and exploring whether drawing attention to the ambiance can stimulate agency there. In this way, this project is not about the design of traffic islands, but rather about finding the link between perception of atmosphere and affordances (research question one) and exploring it through design (research question two).

To stimulate a design exploration of the theoretical link, I used the design tactic of metaphor to concretize and visualize my abstract analysis. My metaphor of the road as a riverbank achieved three aims. First of all, it visually mapped the relation between the concepts of affordances and atmosphere. The metaphor

did not add any new affordances – it is still a road with a traffic light, traffic signs and cars, and there are no added objects, such as, for instance, chairs or picnic blankets. But the metaphor adds a different affective and sensory experience of the road – the sound of water, the sense of grass, the relaxed way of sitting. In this way, design focus is shifted to the sensory and affective elements on the site. In Kato’s visualization, this new atmosphere is added by changing the surfaces of the crossroads – the asphalt of the road is switched to water, grass and cobblestones. In so doing, the theoretical link between the concepts is expressed with specific design elements. Second, the metaphor was an attempt to create a shared vision and language in our collaboration. Hiroshi Kato is from a very different cultural-epistemic background than my own. This meant that he was unfamiliar with the design tactic of using theory to surpass the restrictions of site and with the three theoretical concepts. The metaphor allowed us to talk about changing the approach to an affordance based on the visualization. For instance, we discussed how we could create a different sound on the approach (with a sound-isolating tunnel) and slow down people’s pace (by framing a view to the sea). However, the road as riverbank metaphor was also quite abstract, and it is unclear whether Hiroshi Kato and I ever reached a shared vision and translation of the vision through design. Finally, the third impact of the metaphor was a critique of the design exploration. As was pointed out in the external design critique, the metaphor and our design ideas do not accentuate any of the Anthropocene entanglements of the crossroads. In this way, the metaphor was both an enabler of my design collaboration, yet also a barrier for its continuation. This urged me to revisit my concepts and explore the theoretical link anew.

In conclusion, this stage of my design process illustrates both how concepts influence a design process, and how a design process influences conceptual analysis (my research questions two and three). Most importantly, the three concepts prompted me to change the site from the corner to the traffic islands. And my design tactic of using metaphor gave new insights about the importance of surfaces for sensory experience and the overlooked Anthropocene entanglements in my conceptual link. This illustrates the mutual enrichment between my design tactics of working with theory, collaborating with an architect and working on a public site. Furthermore, this stage of my design process illustrates how I continuously nuanced and developed my understanding of the link between the concepts of atmosphere and affordances (research question one). During this stage I explored several different formulations of this link through design. At the end of this stage, I arrived at a new formulation – the ambiance maintains a shared regime of attention that creates a field of affordances and a de-sensitization to global issues.

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ISLANDS OF COAL

From path design to framing the Anthropocene

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During the second stage in the design process, taking place between October 2017 and May 2018, I was particularly interested in developing a greater understanding of how the theoretical link between ambiance and affordances could be understood in relation to architecture in the Anthropocene, and expressing this understanding through the design of my installation for the Nobelparken corner. *How could an installation draw attention to the ambiance of the crossroads and, through this shift in attention, stimulate people to perceive overlooked affordances and global issues?* Just as in the first stage of the design process, my approach to developing this understanding was the intertwining of a theoretical and a design exploration. During this exploration, I wrote and published a book chapter, wrote the first manuscript for an article to the scientific journal *Ambiances*, and participated in a group exhibition organized by the Aarhus School of Architecture. The book chapter and article manuscript helped me organize and structure my theoretical exploration, while the group exhibition helped to test out my design idea and materiality.

My theoretical exploration was connected to a research stay with Professor Jean-Paul Thibaud at École Nationale Supérieure d'Architecture de Grenoble (ENSAG) in January and February 2018. Professor Jean-Paul Thibaud and his research group, Cresson at ENSAG, specialize in the theory of ambiance. I began my theoretical exploration just before leaving for Grenoble, in December 2017, and continued it throughout my stay at ENSAG. The theoretical exploration had two elements. First, I sought to develop an understanding of my design idea and theoretical work on affordances and atmosphere in relation to architectural practice. I formulated this part of my exploration in a book chapter for a publication by Walter Unterrainer. The book chapter was submitted and edited in January and published in March 2018. Second, I wanted to analyze new precedent studies in more detail in relation to the theoretical link between ambiance and affordances, and in relation to a theoretical understanding of architecture in the Anthropocene epoch. I formulated this part of the theoretical exploration in an article for the scientific journal *Ambiances*. I wrote the article together with Nina Rask, architect and industrial PhD fellow. The first manuscript was submitted in February 2018, revised in September 2018, and published in December 2018. Although our revision of the article took place in the third design stage, writing the first version of the manuscript had an impact on the design exploration of the second stage. Particularly impactful was our narrative inquiry of the text 'General Principles of Architecture' by Marc-Antoine Laugier. In our narrative inquiry, we re-wrote the text and, thereby, connected architectural theory, theory of ambiances and affordances and our precedent analyses. Our narrative inquiry gave a new perspective for my design

exploration and this resulted in a revised design vision. The revised vision was first manifested in the design of my installation during the third stage of the design process. Accordingly, it can be understood as a transition between the second and third stage of the design process. I therefore include parts of the final article connected to our narrative inquiry in this section of the chapter to reflect upon the second stage of the design process.

My design exploration took place in two phases – before and after my theoretical exploration and research stay at ENSAG. During the first phase, I revisited my earlier precedent analyses and explored new precedent projects to discover architectural materials and forms that could visibly interact with the invisible matter of the crossroads. My precedent analysis inspired and informed the choice of material and development of a design proposal. My design proposal was visualized by Gaochao Zhang, architect and PhD fellow. I concluded this phase with an external critique of my design by Stephan Holst, renowned climate engineer and co-founder of Transsolar. During the second phase of the design exploration, which began upon returning from Grenoble, I made more detailed visualizations of my design proposal with the help of Hiroshi Kato and initiated a dialogue with Aarhus Kommune (the local municipality) and Aarhus Festuge (a local art festival) to acquire the necessary permissions for realizing the installation. The design exploration – and the second stage in the design process – concluded in May 2018 because I was denied safety permission for my design proposal and received a rejection to make any installation for the Nobelparken crossroads. Determined to realize an installation, I asked Aarhus Kommune if there was another crossroads at which I could develop an installation. They suggested a different site, which marked the end of the second stage and beginning of the third stage of my design process, described later in this chapter.

Another significant event that marked a transition between the second and third stages in the design process is my participation in a group exhibition in April 2018. Entitled *Forsk!* and curated by Karen Kjærgaard, this was an exhibition of the research at the Aarhus School of Architecture. I decided to develop a new work for the exhibition. My work experimented with the impact of my design approach on people's perception at the exhibition. This exhibition gave me an opportunity to make internal and receive external feedback on both the theoretical and design exploration. This feedback marks the conclusion of the second stage in the design process.

ISLANDS OF COAL AND  
WIND CHIMNEYS

I began my design exploration by addressing the questions raised during the critique of my project at the University of Copenhagen PhD course, in particular, whether sitting on the amphitheater-like construction and looking at the crossroads would be enough to become aware of the invisible Anthropocene landscape. I decided to abandon my design idea for the corner and two traffic islands and, instead, search for architectural materials that interacted with the invisible matter on the

crossroads. This also meant that I adjusted my design vision for the project. Whereas I was, in the first stage of my design process, interested in creating a sensory experience that would have an impact on attention and exploration of affordances on the corner of Nobelparken, I now envisioned an installation that had an impact on people's attention and awareness of global issues while they were crossing the road. To understand how to approach this design vision I first revisited the Ethics of Dust project by Jorge Otero Pailos and the Museums in the City project by David Gissen. In the Ethics of Dust project, Otero Pailos used a sprayable latex to collect the dust and dirt off the surface of a heritage site. As the latex was peeled off, it revealed the dust and dirt of the surface. Subsequently, this translucent sheet of latex imprinted with dust and dirt was exhibited. In the conceptual Museums in the City project, museum lighting was applied in overlooked areas of the city to signal the importance (and artifact-status) of these places.

Inspired by the Ethics of Dust project, I explored the possibility of working with a material that would gather pollution and, as the level of CO<sub>2</sub> saturation increased, change color or form. My research pointed both to many technologically advanced materials that absorbed CO<sub>2</sub> from the air and simple 'materials' such as green plants – however, none of these materials absorbed or transformed the invisible matter in such a way that made it perceptible for people. Rather, they 'cleaned' the air without drawing any attention to its polluted pre-condition. I realized that, following my design vision, it was important that the material not only interacted with the invisible matter, but also activated the people's senses so that the shared regime of attention would be challenged.

I also explored working with a light installation at the crossroads akin to the Museums in the City project. Here, I imagined, a spotlight in the middle of the crossroads would undoubtedly draw attention to it and the traffic and, possibly, even to the exhaust fumes which would become more visible with the correct lighting. However, an installation like this would change the regime of attention to such a degree that the crossroads would be unsafe. Also, it seemed highly unlikely that I would be given safety permission to make such a light installation. The material and installation, then, would need to only subtly change the regime of attention, so as to not disturb the function of the crossroads. I therefore decided to look for other precedent projects that worked with more subtle and low-tech materials that interacted with invisible matter without comprising the functionality of everyday settings.

I found this approach in projects of Japanese architect Hiroshi Sambuichi. Sambuichi works with what he has termed 'energyscapes' and 'moving materials' – that is to say, landscapes of air, sunlight and water. And, with his design, he seeks to make these moving materials visible and felt on the human scale. His intention is to re-connect people to the energy and circular processes of nature. Although Sambuichi does not work with the Anthropocene and subnatures such as the crossroads, his work with making the invisible matter perceptible was very inspiring and informative. There were two projects that were particularly interesting in my exploration. First, the Rocco-Shidare observatory in Japan,

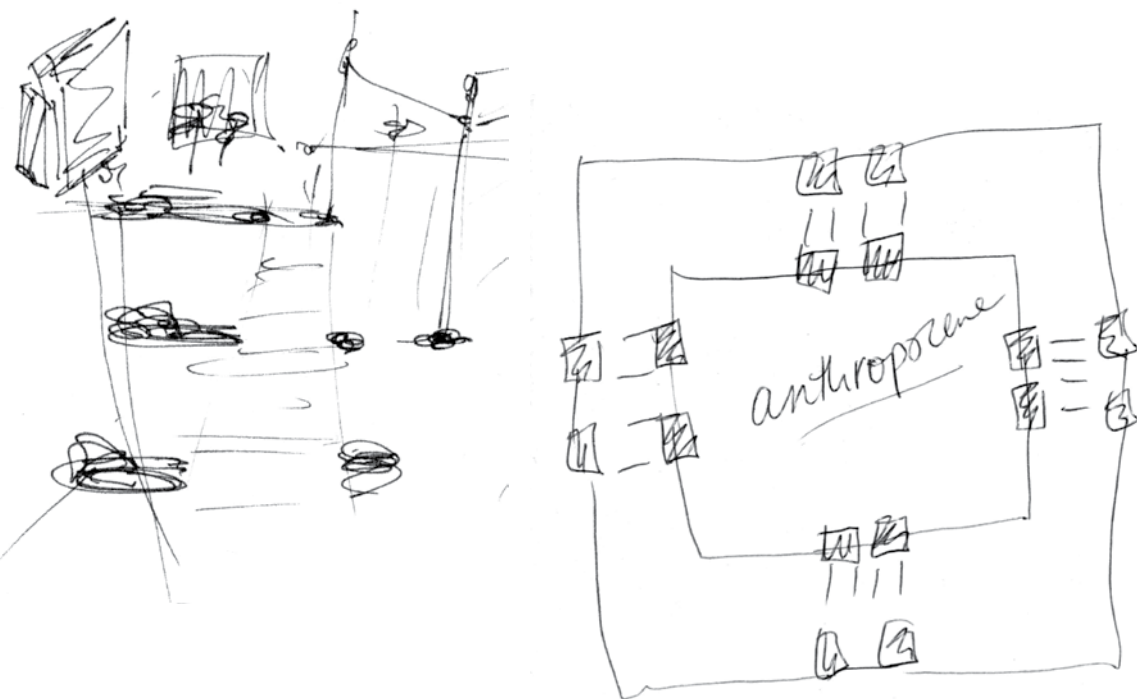
where Sambuichi designed an observation platform that is covered by a dome of thin wooden staves in a geometric construction that is especially designed so that ice forms on the staves and covers the dome in low temperatures. When standing and observing, people are looking through the ice. Thus, it is not only the landscape that becomes visible in the observatory, but also the water in, and the cool temperature of, the air. The second project by Sambuichi that was very inspiring was the Orizuru Tower in Hiroshima, Japan. The top floor of the tower is designed as an observation platform – a hilly landscape fully exposed to surrounding air (no windows, just steel cables for safety). The hilly landscape is designed to enhance the wind flow through the platform, making the wind felt as a quality of the city while people are looking over the skyline. In both projects by Sambuichi, I noticed that it was not the materials themselves that interacted with the invisible matter, but rather their shape and position in the landscape also enhanced the expression of the invisible matter. In the Rokko observatory, the form made water turn to ice more quickly than it otherwise would have done, making it visible. And in the Orizuru tower, wind flow was enhanced through the observation platform to make the wind felt.

With the idea of enhancing the 'moving materials' of the site in mind, I revisited my analysis of the crossroads. Although I did not have the tools to conduct a precise meteorological study, it was clear that the most noticeable moving material on-site was the airflow, i.e. the wind. This was clear because there was no water on-site and (sun)light did not stand out in my site observations. And, in general, sunlight is highly seasonal, so a temporary installation could risk not being exposed to many sunny days. Airflow over the crossroads, on the other hand, was a constant and dominant moving material on-site. My installation, then, could enhance or change the airflow, and, through this, draw attention to an invisible material of the medium. Furthermore, because the air on the crossroads is filled with exhaust fumes, drawing attention to the airflow would also draw attention to the smell of traffic and, thereby, the ambiance of the crossroads and the global issue of pollution in the Anthropocene. I continued my precedent exploration to find materials that interacted with wind.

In my exploration of Japanese architecture, I discovered the architecture of Terunobu Fujimori and found it very interesting for my project. Fujimori uses the Shou Sugi Ban technique of charring cedar wood in all of his projects. This technique protects wooden planks that are clad on outer walls of buildings from insects, rain and decomposition. It is a sustainable method of protection because the wood requires no other artificial coatings. Charred wood also has an interesting and distinctive aesthetic expression – velvety black and deeply textured, forming cracks on the surface. In his projects, Fujimori burns the surface of 2.5 cm planks, leaving about a centimeter of charcoal. More traditional Shou Sugi Ban practices burn the surface of 1.75 cm planks and then brush off the charcoal, leaving a light-brown surface. Both traditional Shou Sugi Ban practices and Fujimori char the surface of the planks by forming triangular chimneys from three planks and making a controlled flame inside the chimney. More contemporary and DIY practices simply use a gas burner to char the surface of each plank.

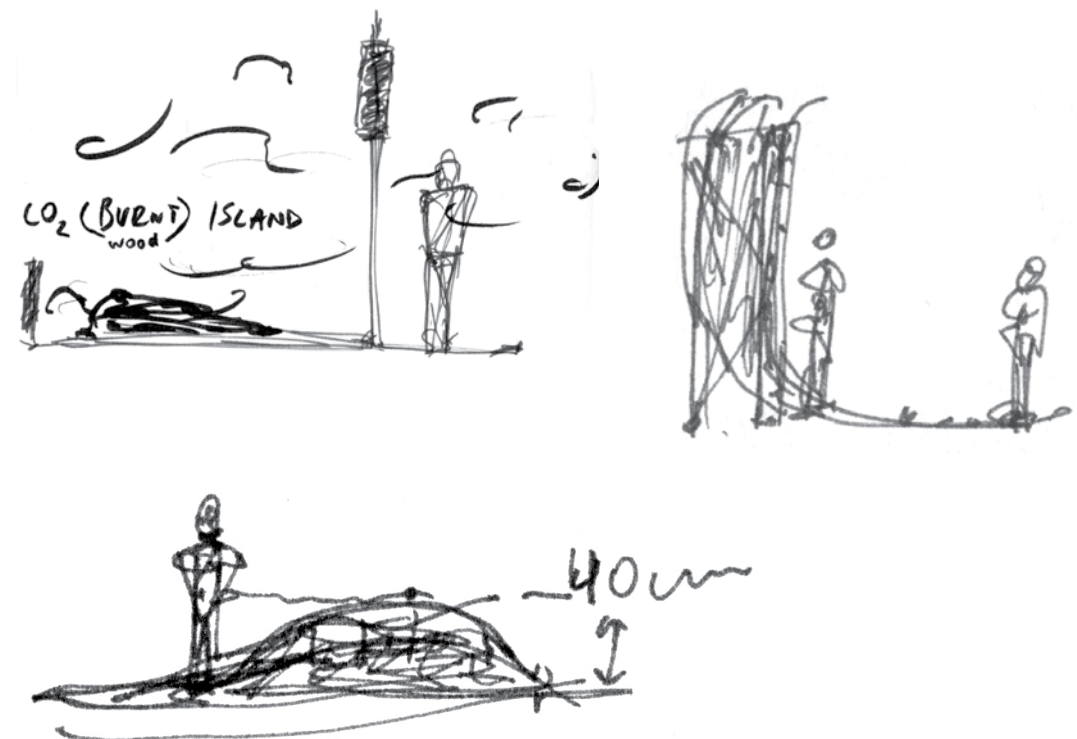
What I found particularly interesting about the Shou Sugi Ban technique for my project was the interactions of the burnt wood surface with the invisible matter in the surroundings. The charred surface interacts with rain and wind, soon leaving a visible weathering effect. Furthermore, although this is not discussed by Fujimori or other Shou Sugi Ban practitioners, I believed that burnt wood would give off a faint smell. Additionally, the charcoal surface, if it is not brushed off, leaves traces when touched or walked on. Also, coal is an interesting symbol for the CO<sub>2</sub> and pollution of the crossroads (itself being a pollutant), and its black velvety color makes a distinct, yet subtle, expression on the grey asphalt surface. The texture of it is distinct from, but not disruptive to, the expression of asphalt. Finally, charred wood is a material and technique that is both economically accessible and realistic for me to accomplish for an installation. I decided that this would be the material for my installation at the crossroads.

In the next and final step of the design exploration, I examined where on the site I could work with charred wood to enhance the airflow. I started by revisiting the traffic islands. Whereas I first analyzed them in relation to people's approach to the corner of Nobelparken, I now analyzed their position in relation to the airflow of the crossroads. I realized that the pedestrian islands formed a square shape around the crossroads when looking from above. They 'framed' the crossroads with their geometry. Furthermore, I noticed that each island has two elevations covered with cobblestones on the right and left sides, with the middle being flat and asphalted for people to walk on. The two elevations surround the people walking across the road. I made rough sketches of this in my notebook.



In the cobblestone-clad elevations, I recognized a potential for an intervention – the cobblestones could be temporarily replaced with a surface of charred wood, either as one sculptural rock-like elevation on each side, or as small stubs of charred wood replacing each cobblestone. I called this idea 'Islands of Coal'. The islands would create a black boundary around the crossroads, metaphorically framing the Anthropocene. This black frame around the middle of the crossroads would be visible when standing on the corners and looking out on the whole crossroads. While walking across the pedestrian crossing, on the other hand, the elevations on the left and the right of each island would attract people with their textured materiality and smell. This, I imagined, would draw people's attention to the road and its traffic, rather than the traffic light and zebra of the pedestrian crossing. The faint smell would also activate people's olfactory registration of place and, possibly, lead them to smell the air of the crossroads.

I also explored whether the shape of the sculptural elevations of each coal island could enhance the wind flow around the crossroads. They could not be too tall, because they would then cover the view to the crossroads, so I worked with a 40 cm estimated height of each elevation. Furthermore, on each corner of the crossroads, I imagined a wind chimney could be designed to direct a gust of wind upwards through the chimney. The chimney would be clad with charred wood on the inside, and the wind gust, I imagined, would provide a strong smell of coal in the air of the corners.



To gain a more precise illustration of my design idea, I reached out to Gaochao Zhang, who made the following illustration.



The illustration is made on a Google Map because it was impossible to find a map of the site with the traffic islands drawn in it. The available maps would have the roads, buildings, trees, lights – but no traffic islands. This was because their design, placement and maintenance were administered by road and safety engineers, and not the landscape and city architects of the municipality. I created a more precise map of the islands and further developed their design in the second phase of the design exploration.

After developing this design idea, in December 2017 I had the opportunity to meet with Stephan Holst from Transsolar and get some feedback on my proposal. I was particularly interested in whether a design of the sculptural form with a height of 40 cm on the elevations could enhance the wind flow and/or direct it in a circle around the crossroads. Also, I wanted to know whether the wind chimneys could create a strong enough wind upsurge to spread an odor to the corners. Stephan Holst found my design proposal very interesting; however, judging by the size of the crossroads, he quickly evaluated that the elevations on the islands (regardless of their shape) could not direct the airflow. He was also hesitant about the wind chimneys – they would need to be very high for a clearly sensed effect. However, he also evaluated that it was possible that people passing between the two elevations of charred wood on each pedestrian island would smell the burnt material.

Following this feedback, I decided to abandon the idea of the wind chimneys and focus on the traffic islands – on the odor that they gave when a person passed through them on the way across the road, and on how they visually created a black frame around the crossroads that shifted attention from the traffic light to the traffic on the crossroads. I also wanted to understand how and whether this new design idea and vision impacted my theoretical understanding of the connection between affordances, atmosphere and Anthropocene. With this in mind, I began my theoretical exploration.

## FRAMING THE ANTHROPOCENE

My theoretical exploration in the first stage of the design process was focused on the theories of affordances and atmosphere and was formative for my first design vision – that a sensory experience on the approach would have an impact on the attention and perception of affordances on the corner of Nobelparken. However, my design exploration at the end of the first stage and beginning of the second stage of the design process shifted this design vision, introduced a new concept, the Anthropocene, and new precedent analyses. My new design vision was that the installation would have an effect on people's attention on the crossroads and make them aware of the global issues in their surroundings. This vision went beyond sensory experience and perceiving possibilities for action (like sitting on a bench). It was a vision for an architecture that stimulated a critical awareness and political engagement in people. I articulated and discussed this vision in relation to architectural practice in the Anthropocene by writing a book chapter for a publication by Walter Unterrainer.

Analyzing architectural practices in the Anthropocene, I noticed that architects' response to the climate crisis was, first and foremost, to reconsider their construction processes and use of resources. The consequence of this is, for instance, new sustainable building requirements and upcycling materials to reduce CO<sub>2</sub> and waste. However, there was little consideration of the users' behavior and people's perception of issues in the Anthropocene. Following my vision for the design installation, architects could, on top of making their own professional practice more energy efficient, also help people to see the global issues in their surroundings and support users in exploring new habits and behavior.

This would also demand that architects reconsider their relation to 'nature'. Architecture, following a long tradition, strives to protect users from unpleasant aspects of nature, such as pollution, debris and deterioration of materials, and draws attention to the pleasant parts, such as a landscape vista or, in the case of Sambuichi, ice forming on staves. But if users are to become aware of pollution, rising sea levels and diminishing biodiversity, their attention must be drawn to the unpleasant phenomena in everyday surroundings. Accordingly, my design vision implies an alternative approach to the role of architecture and understanding of nature. Specifically, this entails an architecture that does not necessarily make a site more pleasant, functionally efficient or comfortable, but, instead, makes the unpleasant 'moving materials' perceptible on the human scale in everyday surroundings. I summarize this argument in the following passage from the chapter (Chebotareva, 2018b, p. 57).

Going beyond designing for functionality and future habits, architects can design for a user to become sensitive to the complexity of the environment. Rather than to program an action and communicate a value, the architect can stimulate users' individual exploration and interpretation of site. The focus of design shifts from communicating through an object to mediating through the users' exploration of the

surroundings. (...) In shifting the intention of architectural design from communicating values to stimulating exploration, the architect works with enhancing the presence of the uncanny by framing the atmosphere. The user becomes an active agent, interacting and interpreting the site to develop a felt understanding of the climate and an increased responsibility. Thus, working at a site such as a busy crossroad, the omnipresent but invisible global issues can be made felt in our local everyday through architectural design.

In formulating my argument and considering the role of the user in architecture, I realized the importance of stimulating individual exploration and interpretation of the site (contrasted to programming for specific behavior). To understand how and whether a shift in attention can stimulate individual exploration, I revisited the theory of affordances. Ecological psychologist Reuben Baron (2008) argues that when a person's body is brought out of balance or when there is a visual disorientation, all sensory organs are activated and the person is stimulated to explore the surroundings anew to regain balance and orientation. In this process of exploration, the person might discover new aspects of the surroundings and perceive new affordances, thereby altering habitual behavior. Baron's argument is based on an analysis of Richard Serra's artworks and the architecture of Arakawa & Gins. Following Baron, architecture can induce a tentativeness in the environment that demands continuous re-orientation by the user. Such tentativeness can be achieved by working with ambiguous forms that bring the body out of balance.

This reading gave a new perspective for my design exploration – to stimulate a person's agency and exploration of the environment, it was important for my installation to bring the body out of balance. Drawing attention to the crossroads, then, might not in itself be enough to stimulate a person to explore the environment anew and become an active agent. Only when architecture (and my installation) stimulates continuous re-discovery of the environment, might it catalyze agency.

Design that stimulates the continuous rediscovery of the environment, in theory, links the concepts of atmosphere, affordance and Anthropocene. When a designed artifact brings the person's body out of balance or disturbs visual orientation, all the users' senses are activated to find a new orientation, and so the shared regime of attention is broken and the multisensory ambiance/atmosphere is brought to the users' awareness. A person, then, might begin to explore the environment anew and, in this process, perceive the landscape of affordances (not the field of affordances), which allows the person to discover new action possibilities. If the installation is placed strategically on a site where Anthropocene issues are overlooked due to habitual behavior, the process of exploration and becoming aware of the ambiance/atmosphere, also helps people to become more sensitive to invisible (and unpleasant) phenomena in their surroundings and, following this, to see familiar places from a new perspective and explore new ways of behavior.

Having arrived at this theoretical argument, I sought to gain a better understanding of how my installation could work with tentativeness by finding new precedent studies to supplement the analyses of the architecture of Arakawa & Gins. Furthermore, working on the book chapter helped me to realize that my theoretical exploration connecting affordances, atmosphere and Anthropocene has an impact on the understanding of the architecture-nature relation and the role of architecture. I decided to explore this relation and the new precedent studies in more detail by writing an article for the scientific journal *Ambiances* together with architect and PhD fellow Nina Rask.

For this exploration, Nina Rask suggested that we conduct a narrative inquiry of a famous historical text that continues to have an impact on the understanding of the role of architecture and the architecture-nature relation in architecture. The text, entitled *General principles of architecture*, was written by Marc Antoine Laugier in 1755. It is part of the curricula in most architecture schools and continues to be referenced in academic discussions of the architecture-nature relation. Narrative inquiry is a method where an analysis of relevant concepts inspires the rewriting of a seminal text. We decided to base our rewriting of the *General principles of architecture* on precedent analyses. We chose the architecture of Hiroshi Sambuichi as one precedent analysis focusing on how architecture can make invisible moving materials perceptible on the human scale. And we chose Sou Fujimoto as the second precedent analysis, focusing on how architecture can work with tentativeness and continuous exploration of habitual environments.

Sou Fujimoto was particularly interesting for this exploration because he analyzes the cave as an architectural typology. Marc-Antoine Laugier also conducts an analysis of a cave in the *General principles of architecture*. However, Fujimoto and Laugier arrive at opposing conclusions. Laugier argues that the cave is a defect of nature and is unsuitable for habitation. This, Laugier argues, necessitates the architect to provide homes for humans that make up for the neglect of nature, provide comfort, and protect from the inconveniences of natural phenomena such as cold and heat. Fujimoto, on the other hand, sees the cave as an environment filled with opportunities and undiscovered potential, stimulating people to continuously explore their surroundings. For these reasons, Fujimoto argues, all future architecture should possess cave-like qualities (Chebotareva & Rask, 2018). In relation to my theoretical exploration, cave-like qualities can be understood as ambiguous forms and a tentativeness in the environment that requires continuous adaptation.

Looking at Fujimoto's oeuvre, it is possible to identify many projects with such tentativeness, for instance, the bus stop designed as a staircase running in-between metal rods in Austria, which was a precedent study in the beginning of my design process. Another project that we found especially interesting to analyze for the article is House NA in Tokyo, Japan. This building is a 'stacking' of transparent thin slabs in an irregular pattern, resulting in floors of the house which also functions as a staircase and walls between neighboring spaces. In some 'rooms' of the house, the stacking of the slabs is so close to each other

that the floor of one room might function as a table or shelf in another room. Inhabitants of this house must continuously re-interpret their surroundings based on their current activity – there is not *one* programming, but an indefinite amount, just like in a cave. Furthermore, the translucent material makes activities from other rooms and the outside become part of one’s visual field. Equally, the irregular pattern of the stacking of the slabs creates multiple points for orientation. Thereby, House NA creates a disorientation that demands continuous exploration to regain perspective and balance. Following my theoretical analysis, this would awaken one’s senses and bring the *ambiance/atmosphere* to one’s awareness. This analysis is summarized in the following section of our article (Chebotareva & Rask, 2018, p. 9, 12).

House NA not only re-invents dwelling through the architectural form, but also through the interactions of the social and natural environments with the building. The skewed floors of the building can be said to enhance the users’ sensibilities towards their environment because they continuously challenge the users’ perception, body and social interactions. The inhabitants in a house of transparent walls and furniture-sized floors must continuously explore their architectural surroundings as they move around. The function of each ‘floor’ is not pre-defined (such as, a bedroom or an office) but must be continuously re-interpreted. Furthermore, in our fictional narrative, we suppose that the transparent floors and walls produce ambiguities and shadows that invite the user to focus on the ambient background rather than fixating on an object. This awakens a playful gaze and a curiosity sparked by the ambiguity. (...) These cave-like qualities necessitate continuous re-interpretation and can make users sensitive to the ambiguities of the city and the complexity of nature by drawing the users’ attention to the invisible aspects of the surroundings. The complexity of nature and invisible aspects of the surroundings is extended in our fictional narrative to also include the urban environment. Therefore, the ‘inconveniences of nature’ include not only rain but also, for instance, burnt oil at a crossroads. However, contrary to Laugier’s vision of an architecture that protects from these discomforts, we envision that the architect and the user of architecture become sensitive to and critically engage with both comfortable and uncomfortable aspects of atmospheres.

Rewriting the *General principles of architecture* and, especially, conducting an analysis of Sou Fujimoto’s architecture as part of this process, gave a new perspective to my design exploration. How could the crossroads be designed to have cave-like qualities? That is to say, how could my installation add a tentative quality to the traffic islands in the pedestrian crossings that would stimulate continuous exploration? It is by stimulating such exploration that my installation could re-direct people’s attention, reveal the landscape of affordances and, possibly, raise an awareness of pollution and other issues of the Anthropocene. This new perspective nuanced my vision for the installation. My installation would not only draw attention to the crossroads but, rather, create

a slight disorientation or ambiguity that activated the body and stimulated an interest in exploring the surroundings anew. Following this line of thought, the effect of my installation would be the exploration of new affordances on each traffic island, and, through this process, possibly an awareness of the global issues of the Anthropocene. In other words, through my theoretical exploration of the concept of Anthropocene in relation to affordances and atmosphere, I realized that to raise an awareness of global issues, it was necessary to stimulate an exploration of the immediate surroundings. Such an exploration on each island, then, would be the effect of my installation. This would also make it possible to observe the impact of the installation – I would simply register if people started to interact in new ways with the pedestrian islands (and thereby perceive new affordances). Thus, I would not need to interview people regarding their awareness of global issues, which could be a very difficult endeavor as an awareness of global issues is often difficult to articulate.

Furthermore, this theoretical exploration brought me back to my theoretical starting point in the first stage of the design process – that the surfaces of the site mediate a link between affordances and atmosphere. However, whereas I analyzed surfaces only in relation to the medium in the first stage of the design process, I now also recognized their significance in relation to bringing the body out of balance and stimulating exploration. This nuanced design direction, however, was first explored in the third stage of the design process. Having concluded my theoretical exploration with the submission of the article manuscript to the *Ambiance* journal, I returned to the design exploration with a more practical concern – to obtain official permission to make the installation.

#### NEW PERSPECTIVES, REGULATIONS AND SITE

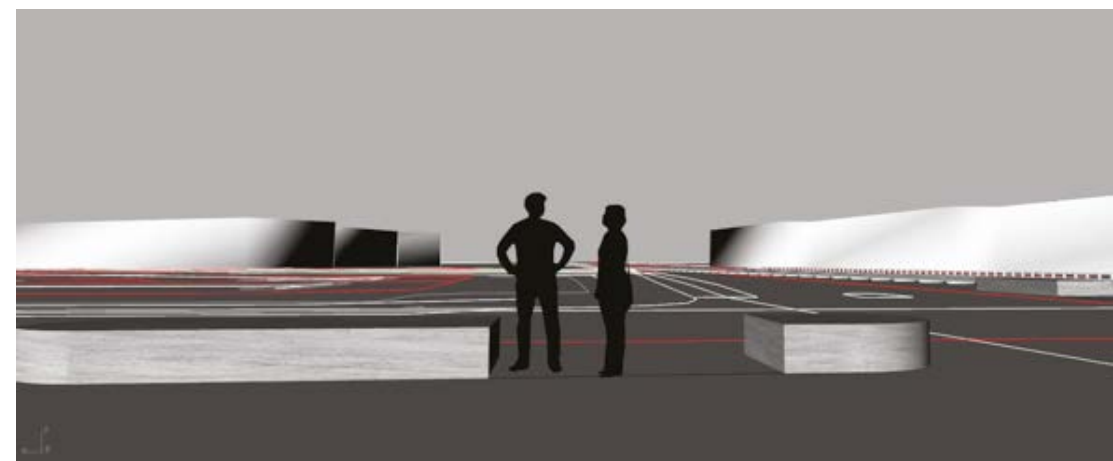
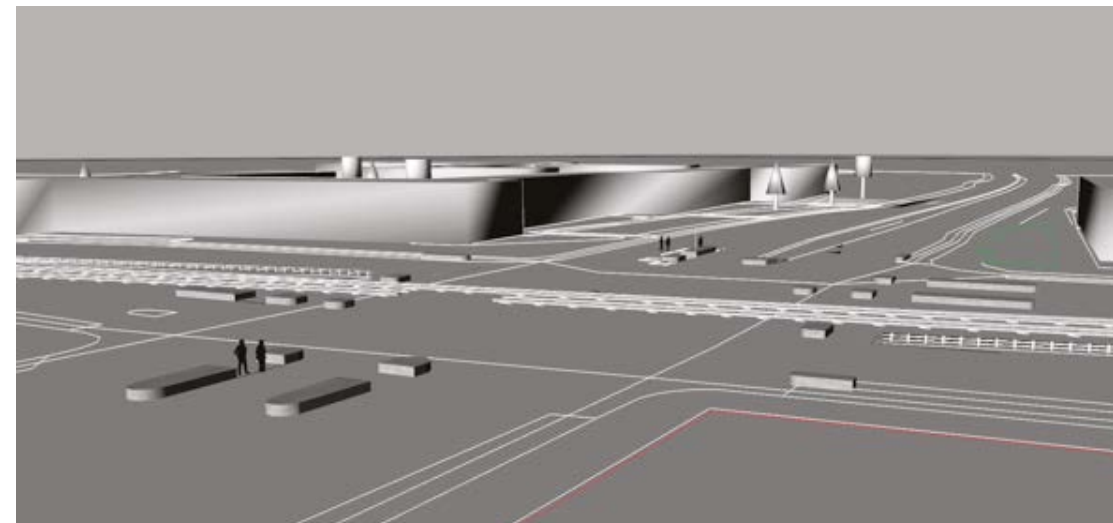
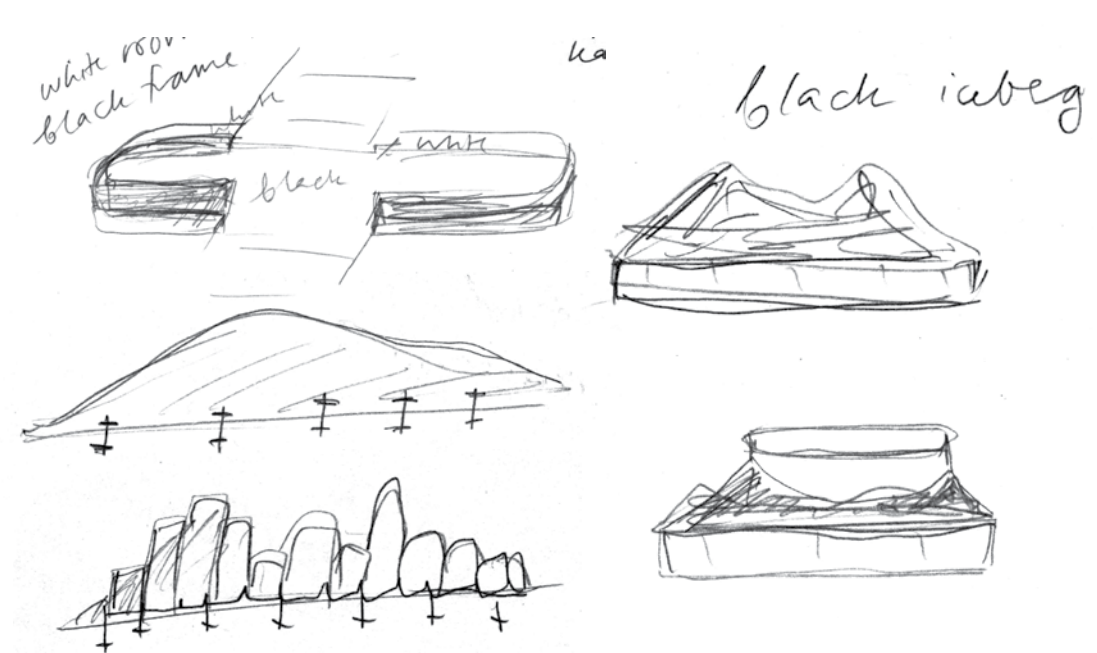
The second phase of my design exploration was defined by my dialogue with Aarhus Municipality and Aarhus Festuge between March and May 2018. I initiated the dialogue by contacting the city architect, Stephen Willacy, to get a recommendation for realizing my traffic island installation. Receiving this recommendation, Stephen Willacy also advised that I make the installation as part of the annual urban art festival, Aarhus Festuge, to be held in the beginning of September 2018. Consequently, I began a dialogue with the organizers of Aarhus Festuge, who were supportive of the idea and proposed to facilitate the dialogue with Aarhus Municipalities to obtain safety permission for realizing the installation. For this process, I was asked to write a safety brief and make visualizations of the installation.

My dialogue with Aarhus Festuge and, in particular, writing the safety brief, illuminated a different, less academic perspective for understanding the effect of my proposed installation. The festival organizers were particularly interested in the installation because it added materiality to an overlooked urban space and, through sensory experience, empowered people to ‘take back’ their city from cars and traffic. The installation, in their eyes, activated the human potential of the city. Furthermore, in writing the safety brief, I realized that

an increased attention on the crossroads would not only make people aware of global issues in the Anthropocene but also, more simply, of the current traffic situation. By activating people's body and senses, the installation drew their attention away from personal thoughts and mobile phones and made people more aware of the cars around them. Accordingly, I argued that the installation makes the road crossing safer by drawing people's attention to the traffic. These two perspectives gave a much more pragmatic understanding of the effect of the installation. Could catalyzing agency through aesthetics (and theoretically linking affordances, atmosphere and Anthropocene) also contribute to urban safety and human-centered cities? Although these perspectives and questions did not affect my design exploration, they gave a new angle for analyzing my design process, artifact and theory.

Concomitant with my dialogue with Aarhus Festuge and process of writing a safety brief, I met with Hiroshi Kato three times and spent a day on-site measuring all of the traffic islands with the help of Jennie Schneider, who also made a precise map of them. I anticipated that I would develop the final design for the installation together with Hiroshi Kato. Following this, on our first meeting, I presented my revised design vision – that the installation would draw people's attention to the crossroads itself, not the corner of Nobelparken, and that people would explore new affordances on the traffic islands. The installation would make people aware of (and give an aesthetic experience of) the crossroads and, in this way, make the road crossing safer by drawing attention to traffic and highlight an overlooked landscape of the Anthropocene. I also presented my design idea of Islands of Coal – to replace the cobblestones on each elevation of the traffic islands with charred wood in an ambiguous shape approximately 40 cm in height. And, finally, I shared my interest in further developing the design idea in an even more subtle direction, perhaps of an uneven charred surface that could be stepped on to activate people's bodies and create a slight disbalance. Hiroshi Kato, however, was critical of this design idea. He argued that it would not stand out visually on the crossroads and, further, that this seemed more of a landscape architecture design proposal than an architectural installation. Landscape architecture was not his interest or specialization, and he would rather have continued working on the three-walled pavilion that framed the sea view on a traffic island that we had discussed in stage one of the design process. I, on the other hand, argued that the concept for the installation (linking affordances, atmosphere and Anthropocene) was conveyed exactly in the visually subtle expression of the installation. With a subtle visual expression, the installation first activated people's bodies through the sense of smell and, then, drew visual attention to the surroundings and not to itself. The design vision was for people to become aware of and interact with what was already present on the crossroad, and not to focus on the designed object.

Ultimately, Hiroshi Kato and I did not agree on the vision, and this disagreement marked the end of our collaboration. However, Kato agreed to make a rough digital visualization of my design idea. Kato's visualization is based on the sketches in my notebooks and our dialogue.







Hiroshi Kato's visualizations, in particular the visualization of the charred wood traffic islands on the precise site map, helped me to evaluate the design idea. Although the perspective visualization is very rough, it shows that the design accentuates the traffic islands. This, in my opinion, makes them stand out in the landscape and draws attention to

the crossroads. And, I imagined, their textured and fragrant materiality (that was not visualized) would affect people on their way across the road. Finally, most importantly, the design summarized my theoretical exploration – my design altered the surface of an Anthropocene landscape with a material that interacted with the atmosphere and activated people's senses and, thereby, shifted the shared regime of attention and exposed the ambiance and landscape of affordances. For the first time in the design exploration process, form and substance were connected. I was interested in working with the design further to develop the surface and work with ambiguity to create a bodily imbalance. However, because this version of the design summarized my theoretical exploration, I decided that it could be realized and evaluated for the hypothesized impact (that people would attend to the crossroads and explore new actions on the traffic islands). I submitted these visualizations to Aarhus Festuge together with my safety brief.

However, in the end of May 2018, I received notification from Aarhus Festuge that they could not get safety permission for my installation. I decided to contact Aarhus Municipality myself to gain a better understanding of their reasoning. I learned that my installation was rejected because it did not respect two traffic safety regulations: First, that any object in a crossroads with a height over 2 cm must be placed at least 1 m from the edge of the road. Second, objects of 2 cm in height must be 50 cm from the edge of the road. Finally, the crossroads by Nobelparken was the largest and most dangerous in Aarhus, so the municipalities would not allow for any design experimentations. As this was the first time I learned of these safety regulations, I suggested to the municipalities that I adjust my design proposal in respect to the safety regulations and that they propose a different crossroads site for my installation. The municipalities responded positively and gave me a new site – the crossroads at the beginning of Ryesgade, in front of Aarhus Banegaardsplads. This new site was the beginning of the third stage of the design process described in the next section of the chapter.

Before beginning the third stage of the design process, and concomitant with finalizing the visualizations with Hiroshi Kato, between March and April 2018, I developed a contribution for the Forsk! exhibition. Receiving feedback for my contribution was an external evaluation of the design and theoretical exploration of the second stage of the design process, marking a change in my design exploration and the conclusion of this section of the chapter.

#### FORSK! AT GODSBANEN

The Forsk! exhibition at Godsbanen in Aarhus was curated by Karen

Kjærgaard and held from April 13 to 26, 2018. PhD fellows and other researchers from the Aarhus School of Architecture were asked to exhibit their research through design projects. At the time of preparing for the exhibition, in March 2018, I only had my design idea of Islands of Coal for the Nobelparken crossing. I had no visualizations or models, and only very rough sketches from my notebooks. I therefore decided to make an installation for the exhibition that would test my idea that the burnt wood materiality and ambiguous objects could create a shift in attention and motivate people to explore other possibilities for action. The exhibition space seemed like a good context for testing this idea because it is, like the crossroads, also a situation with a strict regime of attention and appropriate behavior – people walk around looking at each exhibited artifact and rarely stop to explore the space itself. Could my installation motivate people to explore other affordances in the room?

I also wanted to use the exhibition as an opportunity to test working with Shou Sugi Ban. To find an appropriate form for my installation, I drew inspiration from one of the precedent projects that was formative in the beginning of my research project – Berliner Treibholz by Olafur Eliasson. Berliner Treibholz is an unannounced artwork, performed in 2009, consisting of driftwood from Iceland placed in overlooked sites of Berlin to create frictional encounters that activate people and the urban site. As a result, I decided on an installation of burnt tree trunks placed around the exhibition in-between other works and without a sign describing the tree trunks as an installation. My intention was to, first, learn more about the qualities of charred wood and, second, observe people's interactions in the exhibition hall and whether the tree trunks stimulated any new actions (and, thereby, a shift in attention). The latter intention is summarized in the following passage from my text for the exhibition catalogue (Chebotareva, 2018c).

I would like to introduce you to my research and exhibited work. But first, if you don't mind, take a look around you. Try not to look only at the objects and the people. Instead, focus on the air in-between. And don't just use your eyes, use all your senses. Take a deep breath. How does the air smell? What are the sounds travelling through it? Take a moment to sense how the in-between space makes you feel. Perhaps moving around the room might give an even stronger experience of the surroundings. While doing this, my work might escape your attention. And this is exactly my ambition. My exhibited work is

designed to draw your attention to the surroundings and invite you to explore the in-between space. Just like this small exercise.

There are several burnt tree logs placed around the exhibition space. This is my exhibited work, inviting you to experience an idea that I explore in my research. In themselves – as an object – the tree logs might seem rather insignificant. There is nothing to read, not so much to study. But as you walk past them, their burnt materiality and seemingly ‘out-of-place’ presence might give an uncanny feeling and invite you to look around and re-orient yourself. While you look around, you become more aware of your body, of your senses, and this might make you aware of how the surroundings affect you. As your attention is drawn away from the object, you begin to explore the environment. Such exploration, according to theorists from ecological psychology and ambience theory, can lead to developing new habits and more reflected actions.



In the process of preparing the installation and charring tree logs with a gas burner, I learned two things: First, that different degrees of burning the wood gave different textures and aesthetic expressions. Second, all the tree trunks were charred to different degrees, in accordance with the texture of each tree trunk. I was also impressed with the transition between charred and

non-charred parts of the tree trunks and, accordingly, most of the tree trunks are only partially charred. I also experienced that the tree-trunks did give off a strong smell, especially in the first two days after being charred. After this, however, the odor was very faint and could only be experienced if the airflow came in the right direction or if a person bent down to smell the tree trunk.

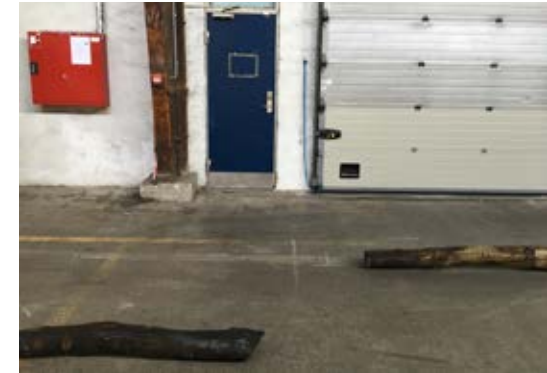


At the exhibition space, I distributed the tree trunks around the whole room, in-between other installations and in relation to features of the exhibition space that I found interesting. Some of these features invited for interaction (for instance, an industrial weight had the affordance of standing on the weight), so I was interested whether my tree trunks could motivate people to explore these affordances. The tree trunks were quite small compared to the large room. This

was intentional. In part due to their heavy weight – if the tree trunks were any longer, I would have needed a crane to handle them, and I did not have the budget for this, but also in part to mimic the comparatively small traffic islands in relation to the large road crossing.



I only had the chance to spend two half-days observing people’s interactions with my installation at the exhibition. This was primarily because the exhibition had scheduled events on many days (such as workshops and seminars) and had an ‘exhibition guide’ each day. The events and guide altered the social context and shared attention regime of the space, making it very difficult to detect if the tree trunks had an impact on people’s attention. Also, I did not make any before observations for comparison because the exhibition hall was closed before the Forsk! exhibition. Regardless of this, in the two half-days of observation, I did not observe that the tree trunks motivated people to explore the room or had a noticeable effect on their attention. However, one exhibition guest did tell me that, for her, the tree trunks stood out and were very ambiguous. This compelled her to explore the tree trunks in more detail, but it did not motivate her to explore the exhibition space itself.



In conclusion, my observations of interactions with my installation at the exhibition showed that people simply stood or walked around the tree trunks. To shift attention, it seems, my installation had to be in more direct contact with the people so that they could not just walk around or pass by the installation. It needed to activate their body directly. Furthermore, at least in this case,

ambiguity attracted attention to the object itself, not to the surroundings. Comparing my installation to the two precedent studies of artworks working with frictional encounters – Berliner Treibholz and Erosion, both by Olafur Eliasson – my installation can be understood as somewhere in-between the two artworks. In contrast to Erosion, it did not necessitate that people interact with it and thereby it did not activate their bodies. Moreover, the tree trunks were not ambiguous enough in the exhibition context to stimulate interactions – in contrast, the driftwood placed around Berlin appeared so out of place in the urban context that the authorities removed it from the streets very quickly after the installation of Berliner Treibholz. This external feedback, precedent analysis and my experiences with charring wood were important for the design development in the third and last stage of the design process.



#### ANALYSIS AND THIRD PRELIMINARY CONCLUSION

The second stage of the design process illustrates the enriching exchange between my design tactics of using theory and designing an installation for a public site. This stage is driven by a design exploration in relation to the site and to materials. This is also reflected in the theoretical exploration of this stage. Here, I use theory to contextualize insights from my design exploration and site restrictions within the theoretical framework to further develop the link between the three concepts of Anthropocene, atmosphere and affordances. This is different to the first two parts of the design process, where I used theory to organize my observations of people's behavior and register the affordances and atmosphere on the site. Consequently, it is my design explorations in this stage that lead to a revised formulation of the link between the three concepts. Whereas the first stage was theoretically driven and principally focused on the stages of concept generation and exploration, this stage of my design process is primarily focused on internal concept critique, design of artifacts and external design critique.

My design exploration is both driven and triggered by my spatial analysis of the site and reactions to its restrictions and regulations. In the first stage of the design process, I analyzed the crossroads and traffic island site from an abstract theoretical perspective of 'the approach to an affordance'. In this stage, however, I approached it from the specific spatial context and its material properties. In my analysis of the traffic islands on the Nordre-Ringgade Randervej crossroads,

I identified three key features: First, that they formed a 'square' around the crossroads. Second, that they each had two elevations of cobblestones that surrounded a person that was passing by on the way across the road. Third, that respecting traffic safety was necessary for designing an installation for this site. These three features had a significant impact on my conceptual and design explorations.

The first feature, the square shape of the traffic islands in the landscape, shifted my focus to the crossroads itself. This resulted in a change of goal for my design exploration – the installation would stimulate explorative behavior on the traffic islands, not on the corner. Following precedent analysis of Hiroshi Sambuichi's architecture and his concept of 'moving materials', I realized that not only materiality, but also form and location, were important for making the invisible moving materials perceptible. I identified air as the moving material that I would work with, because it was so dominant on the crossroads and because it carried the smell of pollution. The square shape of the traffic islands, I figured, could create a circulation of airflow. In this way, I analyzed the traffic islands in relation to their potential to affect the airflow and not only in relation to people's approach to the corner. However, the external design critique from Stefan Holst refuted my logic regarding airflow, and suggested that I focus on giving a sensory experience while people walked past the traffic islands.

The second feature of the traffic islands – the cobblestone elevations – could be used for this purpose. The cobblestones, I thought, could be temporarily exchanged or covered with another material. I explored potential materials that would interact with atmospheric elements such as weather and people's actions and, as a result, give a sensory experience. I found charred wood – Shou Sugi Ban used in Japanese architecture – to be a very interesting material for this purpose. It was both quite easy to work with, gave off a faint smell, and had a weathering effect. Furthermore, its textured black color was not visually disruptive at the crossroads. This was very important in consideration of the third feature of the traffic islands – safety at the crossroads. I realized that my intervention must only slightly disturb the shared regime of attention, so that the function of the crossroads would not be disrupted. This restriction of the site led to a theoretical realization – that there were degrees of disruption of the shared regime of attention.

Overall, the spatial reading of the site gave the project a new focus and design goal. The new aim was to stimulate explorative behavior on the traffic islands themselves and not on the approach to the corner. This new aim had an impact on my conceptual analyses of the installation. In relation to the pragmatic safety regulations, I realized that if people attend to a crossroads, they also attend more to traffic. In this way, my installation might increase their safety when crossing the road. In relation to theoretical analysis, I realized that by exploring immediate surroundings, people become sensitized to global issues of the Anthropocene. This new aim for the design of my installation succeeded in linking all of the three concepts – a shift in attention exposes the landscape of affordances, brings the atmosphere to awareness and stimulates the exploration

of global issues of the Anthropocene. Finally, this new aim also contributed to making the city more human-friendly by adding sensory experience to an overlooked space dominated by cars. With this new aim, the installation could be seen as a contribution to critical spatial practice (research question four).

I contextualized my spatial analysis and design exploration of the site through the strategy of writing a scientific article. In my article I discussed the aim of my installation in relation to architectural theory, arguing that it contributes to a renewed relation between architecture and nature. I also argued that it introduced a new perspective to the theory of atmosphere – instead of studying how an ambience can be staged, design research in this field could also study how an ambience can be brought to awareness. Furthermore, I explored design approaches from the theory of affordances that could stimulate explorative behavior without disrupting the functionality of a site. I identified that bringing the body out of balance and working with ambiguous shapes are relevant for this purpose. These strategies could, to use a term from my precedent studies, add cave-like qualities to a crossroads. Furthermore, through this conceptual contextualization, I realized that not only was the surface important for its material qualities of interacting with the atmosphere and medium (as I explored in the first design stage), but the form of the surface is also a design strategy for bringing the body out of balance. These interrelations between the design exploration and writing an article illustrate how the site, materiality and form studies nuanced my conceptual analysis and theoretical arguments (research question three).

The design exploration and conceptual analysis gave rise to my design idea 'Islands of Coal'. The charred wood on the elevations would have a rock-like ambiguous shape. First this design idea was visualized on a map by Gaochao Zhang and, later, by Hiroshi Kato. The idea received positive external evaluation and I evaluated that the design expressed my theoretical assumption of the link between the concepts of Anthropocene, atmosphere and affordances. I also evaluated the theoretical assumptions about working with ambiguous shapes and Shou Sugi Ban materiality at an exhibition. This was the first external evaluation where an artifact that I designed was exposed to the public. By observing people's interactions with the designed artifact (charred tree logs), I learned that their form was too ambiguous and they did not activate people's bodies. The charred tree logs drew attention to themselves as objects, rather than to the surrounding environment. This led me to revise the design concept – the form and aesthetic expression of the installation should be so discreet on the site that it draws attention to the surroundings. Furthermore, it was important that the installation had a direct interaction with people's bodies.

Finally, this stage of the design process was characterized by collaborations with both an architect and the municipalities. There were three barrier events in these collaborations. First of all, the traffic islands were not registered in any available maps – I was necessitated to measure them by hand. This illustrated that I was working in new territory. The traffic islands are usually only designed and evaluated by safety engineers. This is most likely the reason for the lack in

available maps for architects. My installation challenges this professional divide. A second barrier event was that Hiroshi Kato and I did not share a design vision for the installation. Kato was critical of my design idea for the traffic islands and argued that it was a landscape architecture proposal. This disagreement stopped our collaboration. Furthermore, the disagreement also illustrates how my installation crosses the disciplinary divide between landscape architecture and architecture. It represents a critical spatial practice. The third and most important barrier event was that the municipalities did not grant their safety permission, making it impossible for me to realize the installation. This barrier event ended my design process for the Randersvej- Nordre Ringgade crossroads. However, the municipality suggested a new site and informed me of the safety regulations at a crossroads (e.g. 2 cm height limit). Reacting to this barrier event changed the course of my design process.

In conclusion, this stage of the design process illustrates how the site and spatial context can influence and inform both a design and a theoretical exploration (research question three). The site shifted the goal for the design project and, through this, suggested a link between the three concepts, which I then further elaborated through conceptual analysis. My conceptual analysis, in turn, identified the contribution of my design project for developing empirical research on atmosphere, and found new design strategies for the installation (research question two). Furthermore, the site and my collaboration with municipalities had barrier events that strongly affected the course of my design process. This illustrates the complex nature of a design trajectory and that a design process is both reflective and reactive. Finally, the new aim of my design project also exposed the project as a spatial critical practice that transcends disciplinary boundaries (research question four).

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URBAN CARPET

From framing the Anthropocene to surface design

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The third and final stage of my design process marked its culmination with the design and realization of the installation Urban Carpet for the crossroads in front of Aarhus Banegårdsplads in Aarhus, Denmark. This stage in the process was also the shortest, lasting from just June to December 2018, with Urban Carpet installed on-site from August 29 to September 5, 2018. It was characterized by a very intensive design period, in one week in mid-June, and a very intensive production period, in the last two weeks of August. The two months between design and production were focused on obtaining safety permissions for the installation, including sending the design proposal for approval to the police, the fire department and the Danish Society of Blind and Visually Impaired People. The month following the installation was spent analyzing the impact that the installation had on people's actions on the crossroads.

Most defining for this stage in the design process was my design exploration with a new collaborator, Elias Melvin Christiansen, architect and PhD fellow at Aalborg University. I reached out to Elias at the very beginning of this stage, just after my collaboration with Hiroshi Kato had ended and the municipalities gave me a new site in the beginning of June. Elias and I first met at the PhD course at the University of Copenhagen in October 2017. Consequently, Elias was already familiar with my project and research through design methodology. He agreed to join the project and collaborate to develop the final design of the installation. Furthermore, his own research project on Urban Tectonics was also based on the theory of atmosphere and was relevant for my design idea for the traffic islands. The design exploration and realization of this stage in my design process was accomplished in collaboration with Elias Melvin Christiansen. The design exploration concluded with external feedback to the Urban Carpet installation. The feedback consisted of my observations of people's interactions on-site before, during and after the installation, citizen complaints to the municipality, and reviews of the installation in the media.

This design stage did not have a theoretical exploration. Instead, this stage was the design articulation and transformation of my theoretical and design explorations of all preceding stages in the design process. In October 2018, following the realization of Urban Carpet, I worked on the revised manuscript for *Ambiances Journal* in which I included the results from my first analyses of the impact of Urban Carpet. The revised manuscript, published in December 2018, marked the conclusion of my design process. A second conclusion of my design process or, perhaps, a perspective on the design process, was my contribution to the second *Forsk!* exhibition, curated by Karen Kjærgaard and held from November 2 to December 20, 2018 in BLOX in Copenhagen. For the

exhibition I chose to exhibit parts of Urban Carpet as artifacts for observation; that is to say, without any intention to have an impact on people's attention or exploration of affordances. This gave me a possibility to internally evaluate, for the first time in the process, the design for its qualities as an object (in contrast to evaluating its effect on perception).

DESIGN EXPLORATION

My design exploration with Elias stretched for just over one week, from

June 14 to 22, 2018. During this time, we only met twice: first for a site visit and then for an exploration of materials and construction techniques in the Mock Up space at Aarhus School of Architecture. During this week we also had some design discussions over the phone and email correspondence. Needless to say, this design process was very intense and efficient. We could not spend time exploring different design options or making many prototypes because I needed to send our design proposal to Aarhus Municipality by late June, before their summer holiday closure in July. We made design decisions quickly and held our explorations within the framework of my design vision, the site safety regulations and a small budget.

Our framework was as follows: an installation for the pedestrian island on the road crossing in front of Banegårdspladsen that could have a maximum height of 2 cm if removed 50 cm from road, and a maximum height of over 2 cm if removed 1 m away from the road. Additionally, the installation could not leave any marks or damage the traffic island, so it needed to have a carefully designed mounting technique. Following my material and precedent studies, the installation would be made out of charred wood to interact with the atmosphere. Furthermore, the installation, in accordance with my design vision, had to activate the bodies of people crossing the road and draw their attention to the surroundings and not to itself as an object. Finally, with reference to my reflections on the *Forsk!* exhibition in April 2018, I aimed for an installation that necessitated people to directly interact with it and was not too ambiguous or visually disruptive.

We began our first meeting and site visit, on June 14, by discussing my design proposal for Nobelparken in relation to the new site. The road crossing at Banegårdspladsen is very different to Nobelparken. It is also very busy, albeit primarily with pedestrians. It is a crossing over a two-lane road (that is to say, a much smaller road than at Nobelparken) with lower speed limits than at Nobelparken. It is in a very central location, in front of the main train station and at the beginning of the main shopping street, Ryesgade. There is also a great deal of bus and taxi traffic at the crossing, with both a major bus stop and taxi parking in front of the main train station. There are cafes and shops on both sides of the crossing and the pedestrian crossing is used by very many people daily. Both Elias and I had been there many times before. What was interesting, however, is that, despite my many visits to this crossing, I had never looked around the traffic island on the crossing and remarked upon its features.

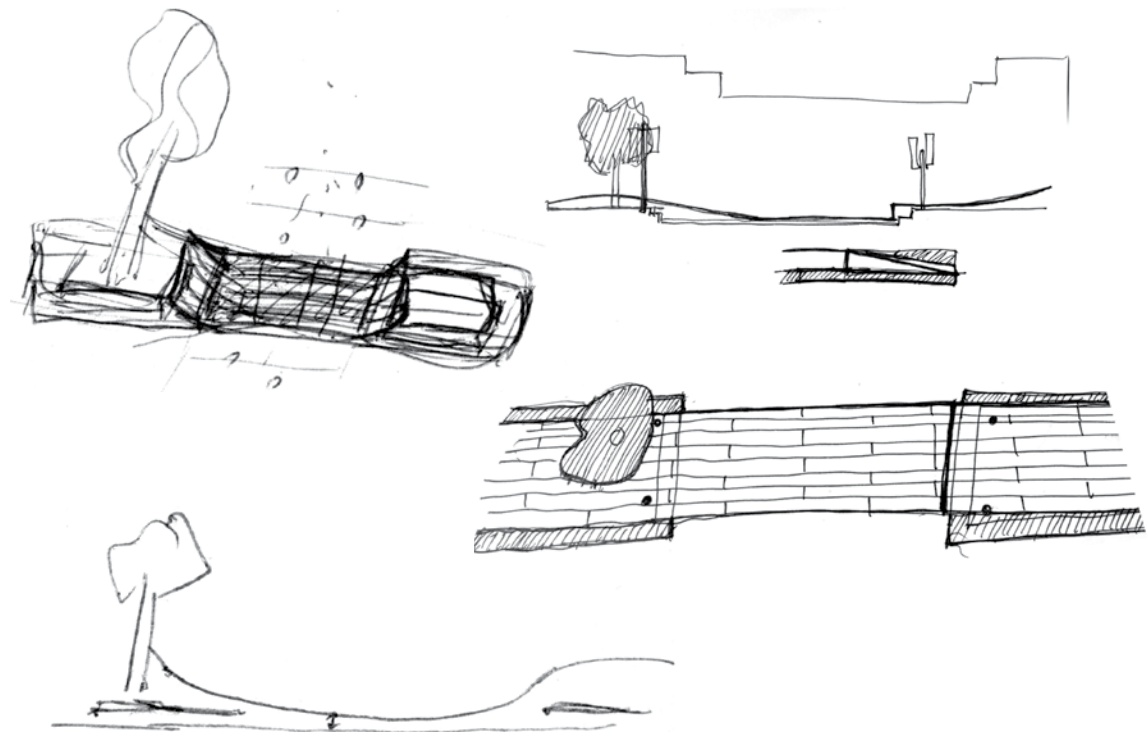
This crossing had just one traffic island. However, this single island was much larger than any of the traffic islands on Nobelparken and had a tree on one of the elevations. I remarked straight away that working only with the surface of the elevations would not work on this site because the middle, asphalted part of the island was so large that the two elevations were barely noticeable when looking at the traffic island from afar and, especially, when crossing the road. The two elevations were experienced as separate to the middle part of the island, so a design for each of them would not create a unity of sensory and affective experience when crossing the road. Furthermore, the elevations did not frame anything, like they did in Nobelparken. Thus a change in their design alone could not stimulate a shift in attention.

Following this, Elias suggested to look for other urban elements around the crossing that could be designed together with the traffic island elevations to create a unity in experience. We looked at, for instance, tiles in the pedestrian street on one side of the crossing, but we evaluated that this, also, would not give a unified expression to the installation and experience of the road crossing. Working with the tiles is comparable to my first design exploration of changing the surface of the corners on Nobelparken to brick, which did not result in an interesting installation. Furthermore, it was unlikely that we would get permission to redesign the tiles. We therefore decided to work only with the traffic island. But instead of only changing the surface of the two elevations, I suggested to also change the surface of the middle part of the island. This, I reasoned, would encourage people to interact with the installation because they had to step on it to cross the road. Furthermore, we both agreed that this would visually connect the two elevations and the middle part and give the island a unified expression. Doing so, I imagined, would accentuate the island and create a place to notice and explore, thereby inviting people to spend longer time in the middle of the road with their senses activated.

Next we began to explore design ideas. We agreed that the installation should not be 1 m away from the road because this would give us very little space to work with and the installation would not create a unity of expression on the island. Consequently, we could only work with a height of max 2 cm and our installation needed to follow the landscape at the two elevations so that it would also be raised on the sides. Furthermore, compared to the cobblestones on the elevations which could, potentially, be temporarily removed and replaced with stumps of charred wood, the asphalt could not be removed. So our installation would need to be put on top of the traffic island, but mounted in such a way so that it did not damage the asphalt. By the end of the day we had developed two design ideas. The first idea was to create a ramp-like construction of charred wood, which, in the middle of the road, had a height of just 2 cm. Skate ramps were both thin, very durable (making it appropriate for a busy pedestrian crossing) and had a mounting that would not demand attaching anything directly (i.e. drilling holes in and damaging) to the asphalt in the middle of the island. A ramp construction was also very sculptural and ambiguous at a road crossing, and the idea was inspired by my design proposal for Nobelparken (which also worked with sculptural elevations). However, I

was concerned whether a ramp could be just 2 cm high on the middle and Elias was concerned about building a very gradual elevation on the sides.

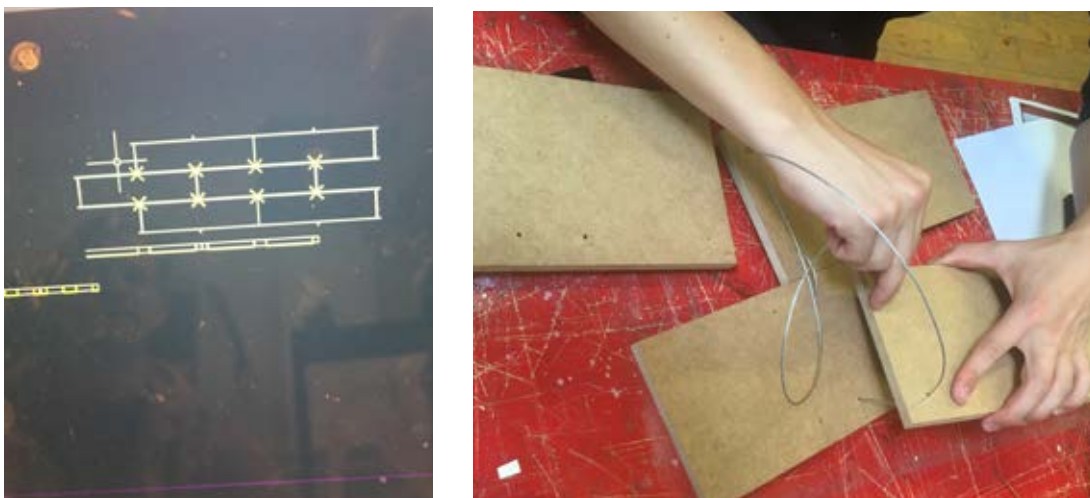
We therefore continued to explore and developed a second idea, based on an adaptation of the construction in the first idea. We wanted to continue working with the top sheet of the ramp but make it more flexible on its own, so that we did not need the ramp construction holding it up. The thin top layer of a skate ramp is made of rectangular planks of wood stretching the breadth of the ramp and hammered onto an underlying ramp construction. We imagined that it would be possible to replace the rectangular planks with small pieces of wood woven together to make the sheet much more flexible and the ramp construction redundant. This flexible sheet could lie flat on and cover the whole island, including its elevations. The sheet would be less sculptural than the ramp because it would lie on top of and simply follow the landscape. This, we both felt, was very interesting because its form would be the exact form of the traffic island. It would accentuate the features (and affordances) that were already present on the traffic island without introducing any new forms (and affordances). Furthermore, I imagined that by being so thin, black and following the landscape, it would also be visually very subtle and, thereby, first stimulate a shift in attention when people walked over it in the middle of the road crossing. By being visually very subtle and not ambiguous in its form, I inferred that it would not create a new ambiance or strong change in behavior, but simply draw attention to the already existing ambiance and atmosphere that escape peoples' awareness. We both made rough sketches of this idea in our notebooks.



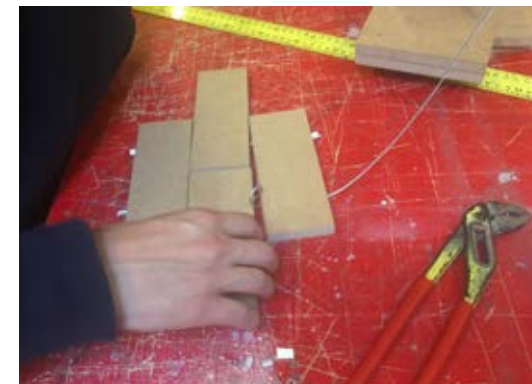
The next step was to research the construction techniques for our two ideas and begin making technical drawings. We did this between our first and second meeting and communicated by email. There were no available precise maps of the traffic island so, just like on Nobelparken, I spent a day measuring the traffic island with the help of Anyanna Zimmermann. The traffic island turned out to be approximately 100 m<sup>2</sup> in size, larger than any of us had expected. Elias used our measurements to make the technical drawings. We both conducted research on the different construction techniques, and both came to the conclusion that the weaving technique was more interesting and realistic to realize. Building a ramp of just 2 cm in height seemed to be practically impossible. Also, we were intrigued by weaving wood. Elias was interested by this because it was an unusual perspective for urban tectonics, and I was interested because it would create an installation with a form that did not create any new affordances but simply draped over and accentuated the affordances that were already there. Elias found and shared the following weaving technique, which we decided to test out on our next meeting.



On our second meeting, on June 21, we worked in the Mock Up space. Elias had prepared a rough technical sketch of the zig-zag weaving principle. We cut out small pieces of MDF boards and attempted to weave them together with copper and steel threads. We tried this using a cross-like weaving connecting the four corners of four small pieces.



However, the copper and steel thread created a bulge on the joint corners. That is to say, the four corners that were woven together could not lie flat on the underlying surface. We attempted to fix this in different ways (e.g. with a hammer), but the metal thread would not flatten out in the weaving and the joint corners bulged upwards. I therefore suggested a different weaving technique. I imagined that if the metal thread was to go through the inside of the wooden pieces, we would not have a problem with bulging. My suggestion was to make two holes going through each wooden piece and weave the pieces together like pearls on a thread. They would need to be slightly askew so that all the pieces were interconnected – that is to say, a thread going through the right hole of one piece would need to go through the left hole of the next piece, and so on. We decided to test this idea and were quickly met by a technical constraint that influenced our design – the drilling machines could make a hole of maximum 6 cm in length through a wooden piece that was 2 cm thick (because the drill vibrates, it has an error margin, and does not drill in a precisely straight line, so a hole any longer than 6 cm would demand more thickness for the error margin). Since we could not increase the thickness of the wooden pieces, we were necessitated to work with 6 cm broad pieces. This, in turn, influenced the length of each piece. The weaving technique demanded that each piece



had two holes and they were woven askew to each other. Also, the pieces needed to be small enough to follow the landscape elevations without creating bulges. To do this without leaving a large distance between the woven pieces (which we did not want, so that the many pieces of wood were experienced as a whole), Elias calculated that each wooden piece needed to be roughly 15 cm in length. We then experimented with this technique and proportions.

The weaving technique succeeded in keeping the pieces of wood interconnected and flat on the surface, so we tested how flexible it was on elevations. This was also successful and we were both very happy with the result. We used simple wire clasps at the ends of the woven wood pieces. We were both satisfied because the wire clasps did not visually stand out – we wanted the focus to be on the surface – but we were concerned with the durability of the wire clasps. This issue was also pointed out to us by the Mock Up space supervisors. However, they did not have any other suggestions and we, unfortunately, did not have time to explore other options. We had also



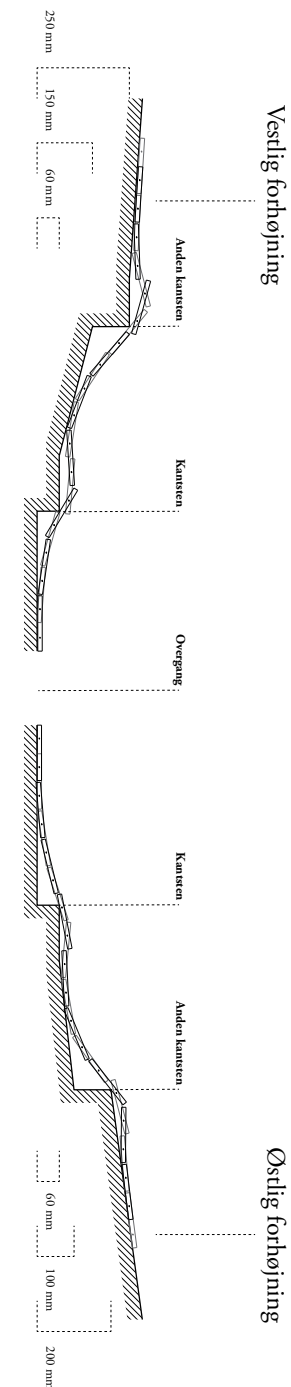
wanted to test the charred wood materiality on the design, but we simply did not have the time or opportunity to do so. We both, however, imagined that the charred wood would work well with the design. In particular, we were both excited about the black traces of coal that we assumed would occur in the zebra crossing when people walked over the charred wood surface of the traffic island. In this way the materiality not only interacted with weather (drawing attention to the atmosphere), but also with the people's movement (drawing attention to the ambiance). Furthermore, assuming that the process of charring the wooden surface would take some height off our 2 cm wooden pieces, we estimated a height of just 12 mm for our installation. Although I originally wanted to work with cedar tree because it is traditionally used in Shou Sugi Ban and also has a strong odor that could enhance the sensory experience of the installation, we decided upon birch wood because this was used for skate ramps ensuring their durability and flexibility and it is a local and accessible material. Following this, we settled on the design and Elias made technical drawings of it after our meeting, which I sent to Aarhus Municipality on June 22, 2018.

*See pages 123-125*

Concluding our design exploration, Elias made a visualization of the installation for the Aarhus Festuge communication team and I suggested entitling the installation 'Urban Carpet'.



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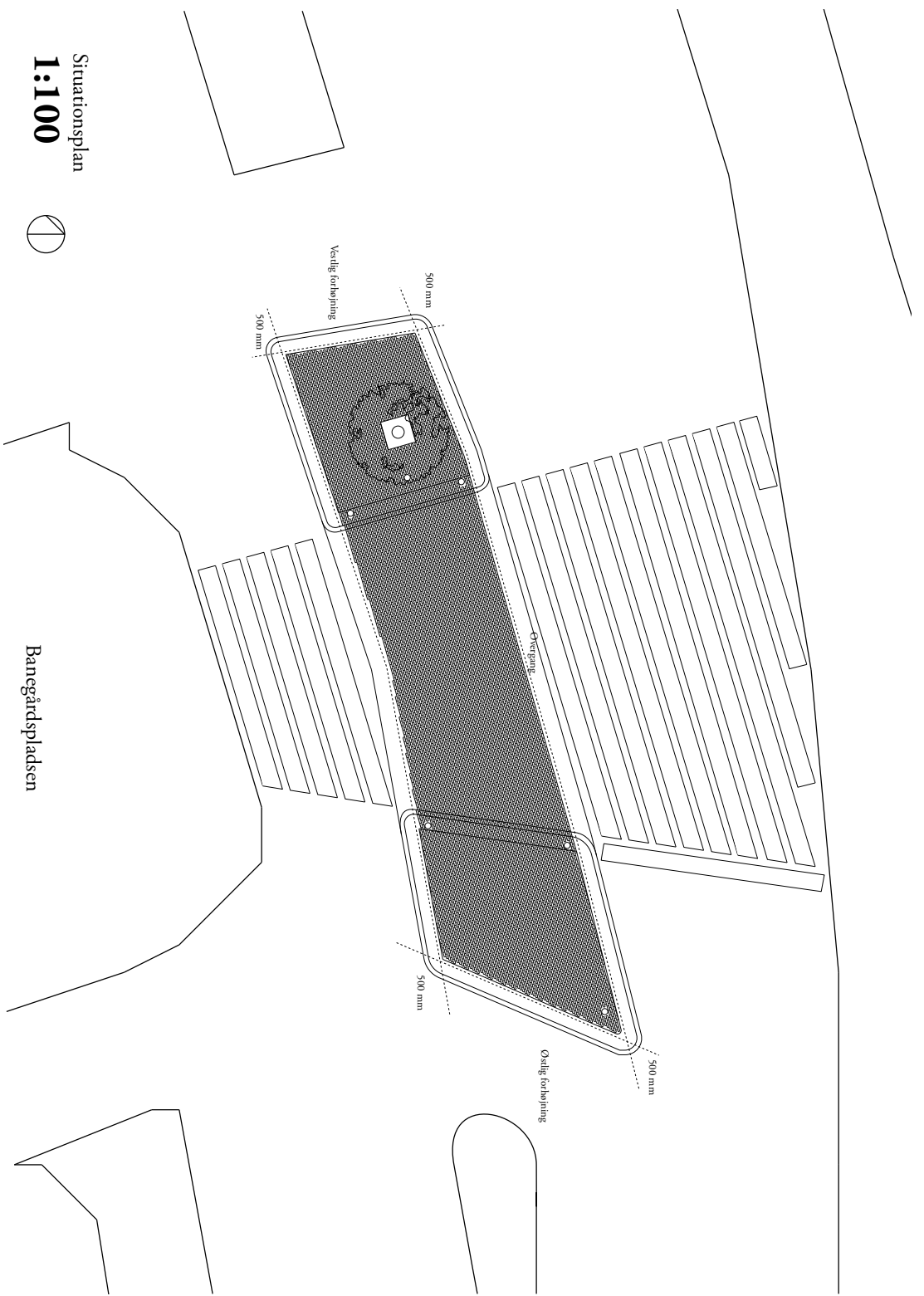




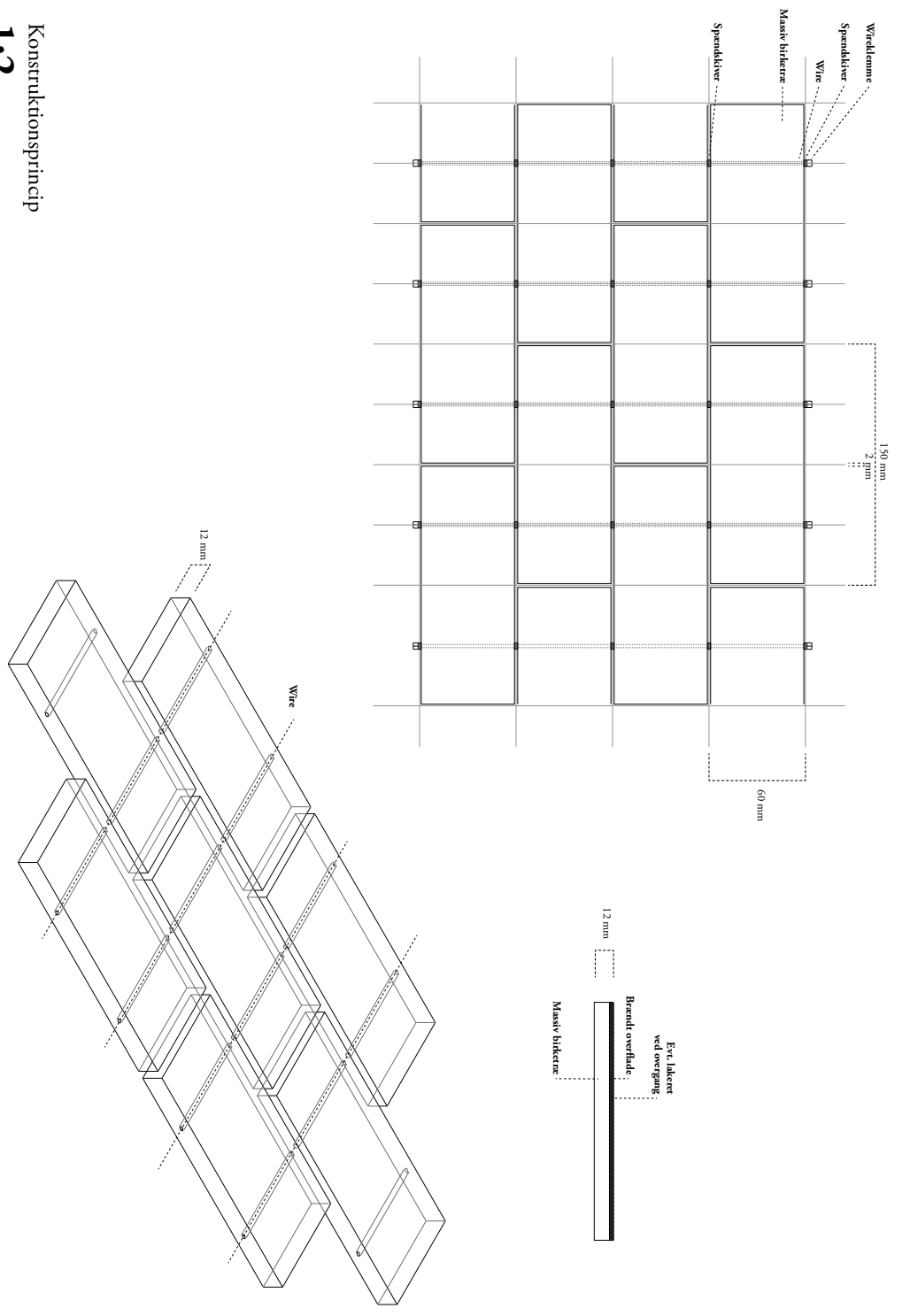
Situationsplan  
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Banegårdspladsen



Konstruktionsprincip  
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## PRODUCTION OF URBAN CARPET

a caseworker from Aarhus Municipality, along with the police, fire department and Danish Society for Blind and Visually Impaired People. None of the parties had any significant concerns with our design and, therefore, the dialogues did not result in any changes to the design of the installation. Although the caseworker was somewhat reluctant to give their safety permission, this permission was finally granted on August 2, 2018, with the caveat that if the municipalities received any complaints, we would need to make changes to the installation on-site.

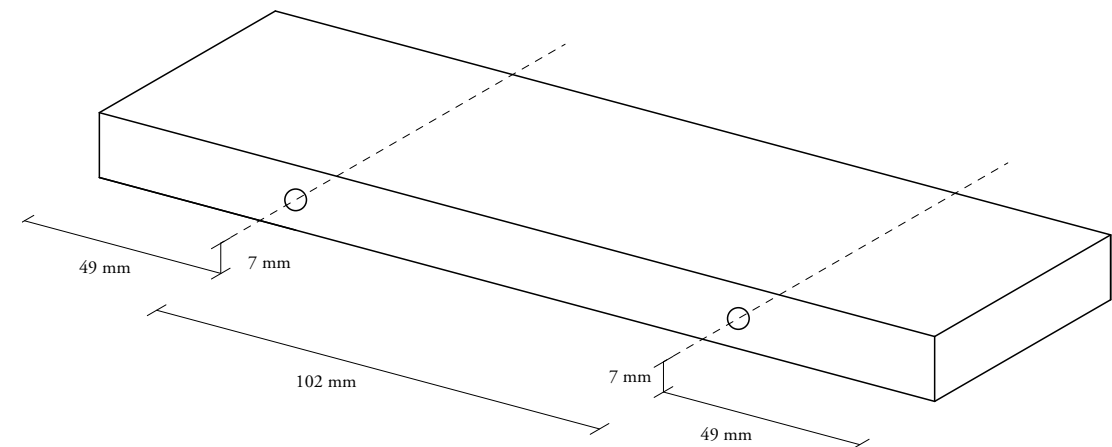
Relieved, we began the production process by calculating the necessary amount of and ordering materials. This process did not have any influence on our choice of wire and wire clamps, but it did impact our choice of wood type. I discussed our installation with a wood expert from the sawmill and was advised to use the most durable type of wood – oak. Oak, however, was too expensive for our budget. Birch was also very expensive. The cheapest and least durable wood type was fir, and in the middle range of both price and durability was Douglas fir. Furthermore, the sawmill also said that Douglas fir was the wood type with most noticeable odor (something I asked about to enhance the sensory experience of the installation and mimic Cedar wood). Elias and I therefore agreed on using Douglas fir. We needed 550 m of wooden planks with a 15 cm breadth and 2 cm height (the lowest breadth and height available at the sawmill) delivered in less than one week. The sawmill agreed on an exceptionally speedy delivery for August 13, 2018.

We knew that a production time of 16 days was very tight, so, on August 6, we spent a preparatory day in the Mock Up space to test and set-up the production and make a larger prototype. During this day we made decisions that had an impact on our design. In the process of making the prototype (sawing wood planks into small pieces and drilling holes), we quickly realized that there would be a bottleneck in the drilling of holes in each piece of wood. It took a considerable amount of time to drill each hole (approximately 20 seconds per hole) and there was only one machine that could drill them efficiently (so only one person could work on this at a time). According to Elias' calculations, we would need 10,300 small pieces of wood for the installation, meaning that we would need to drill around 30,000 holes (taking into account errors during drilling). We knew that we had to reduce the number of wooden pieces to be able to produce the installation in 16 days. Following this understanding, we made a final decision regarding the shape of the installation. Before our preparatory day, in an attempt to reduce the amount of wood necessary for the installation, Elias experimented with an adjusted design that was thinner and more rectangular. At first, we were both reluctant to make a decision on this adjustment because it did not follow the shape of the traffic island as well as the first version. This adjusted design had its own, rectangular shape and we were concerned that it would stand out visually more as an object in itself. However, following the challenges of drilling holes on the preparatory day, we

In the following month of July, I was in dialogue with the safety engineers from Aarhus Municipality,

both agreed to continue with the adjusted design because it demanded fewer wooden pieces.

Challenges with drilling holes also led us to make a second important design decision. The drilling machine was not consistent in drilling straight holes of 6 cm in length (sometimes it just did not go through on the other end of the piece of wood, but mostly the two holes were slightly diagonal). We therefore decided to switch to holes of 5 cm in length. This also meant we could use a thinner drill, giving us at least 2 mm in the wood pieces below the hole (to make sure the hole was lifted off the ground) and a bit over 10 mm on the top (which left room for charring the surface). This resulted in our choice of wood pieces with a breadth of 5 cm. The wood pieces needed to have 4 mm between each piece when woven together (to leave room for wood expansion and ensure flexibility of structure). Following Elias' calculations, this meant that the wooden pieces needed to be 20 cm long. Making the wooden pieces 20 cm long (instead of 15 cm long) would also reduce the number of wooden pieces (and holes) necessary – a much-welcomed result. Following this decision, we would need to make 10,000 wooden pieces in total and drill approximately 20,100 holes. We also compared the two proportions of the wood pieces by making a mock-up of each. Visually, we were content with both prototypes, so our decision was ultimately based on reducing time of production. Elias also adjusted the technical drawing.



As soon as the wood arrived, on August 13, we began our production process. In a final attempt to compensate for the production bottleneck of drilling holes, on the first day of production, we made a structure of five working stations: first, sawing each plank into three thin planks of 5 cm each in breadth, second, sawing each thin plank into smaller 20 cm long pieces, third, drilling two holes in each piece of wood, fourth, weaving the pieces of wood into strips of carpet, and fifth, charring the surface of the strips of carpet. We agreed that we should prioritize producing enough small wooden pieces for one person to begin drilling holes as soon as possible. Following this, insofar as possible, we should always be working on two posts – so, if one person is on the first post, the second is on the second post, and so on. In this way we could produce the small wooden pieces most efficiently. We also made the first strip of carpet to evaluate the results. We were both very satisfied – especially with the charred wood pieces that resulted in a very nuanced surface – so we continued as planned.



In the following 15 days, we worked on production non-stop and with no additional changes to the design. This was in part because the production plan we set up on the first day seemed to be working and we did not run into any more problems that demanded a change in design. But, equally important, we simply did not have time to make any changes, so we also did not allow any experimentation. During the course of the entire production process we were joined by Martin Nolan, an exchange student who volunteered to help after seeing my post on the Facebook Student Bulletin Board of the Aarhus School of Architecture asking for help to produce the installation (I posted this in the week before we began production). We were also helped by our friends Anne Dall, Anyana Zimmermann, Elizabeth Donovan and Galina Skladtchikova. However, for most of the time, there were just two people working at any given moment. I was also the only one allowed to work on the saw and drilling machine outside the opening hours of the workshop (following agreement with the Aarhus School of Architecture).

All of our decisions during this process were made based on our circumstances. For instance, we assembled the pieces of wood together in strips that had the breadth of the working table (and the length corresponding to the breadth of the final installation). And we made the decision to assemble on a working table to make it possible for two people to work on the assembly at one time (and to prevent back pain from working on assembly on the floor, as we had experienced on the first day). This was a circumstantial decision that proved to be very useful for the later transportation of the carpet. The strips of carpet could be rolled in compact 'snails' and transported in a regular van (instead of having to rent a special, long transportation vehicle). Also, these strips had a size and weight so that they could be lifted by two people.



Perhaps the only design decision that was made during this process was regarding the degree of charring the wood. We experimented with different degrees of charring when we charred the first strip of woven wood. We both agreed on a charring that was as deep as possible to give depth and texture to the surface. However, the depth of charring was also conditioned by the metal wire, which caught on fire if the gas burner was held over the wood for too long at a time (although we ordered steel wire without nylon, there must have been some nylon replacement that could catch on fire in the wire which the packaging did not mention). Then, following our production plan, we could spend approximately 30 minutes charring each strip. This, however, was enough to achieve our desired textured surface. It was also because of our time constraints that we decided not to char the wooden planks in triangular chimneys, as is traditionally done in Shou Sugi Ban. We also discussed whether we should brush off the coal (like traditional Shou Sugi Ban) or leave it as it was (like Fujimori) or treat it with oil (like some contemporary Shou Sugi Ban practitioners do for durability). We decided on a middle ground – we would brush off the charred surface very lightly but leave most of it for texture. And we would not use the oil to preserve the texture and its smell of burnt wood. We chose to brush off some of the surface texture because it was very dusty and I

was worried that it would leave too many traces on the crossroads, leading to complaints that would necessitate us to change the installation. Finally, in the process of obtaining the safety permission we were asked to make sure that the carpet did not become slippery when wet. We experimented with the first charred strip of carpet by leaving it out in the rain. We discovered, as we had expected, that the construction of many small pieces of wood ensured that it was not slippery. We were also happy to discover that we left enough space between each wooden piece (4 mm) to account for expansion of the wood when wet – after the rain, the strip of carpet was lying flat on the ground without any bulges and was just as flexible as when dry.



Finally, in the afternoon of August 28, we had charred the last strip of wood and began preparing for the installation on-site. We had planned to install the carpet outside rush hour to avoid many people and expected to be finished by midnight. However, installing Urban Carpet took much longer time than expected – we spent all night installing it, finishing in the early morning of August 29. The unexpectedly long installation time was primarily due to the massive size of the installation. But it was also due to challenges that we encountered while installing. For instance, we needed to weave around different elements of the islands – such as the tree, the traffic light, and other poles. To weave around these elements, we were necessitated to unweave the strips of carpet to the shortest length and then weave them together again around each element. Also, we had anticipated that the strips of Urban Carpet would come together as easily as a puzzle – but it was difficult to fit the pieces together because they were slightly askew. After the strips were fitted to each other, we needed to connect them by threading a wire. Whereas this was easy to do on the individual wood pieces when working in the Mock Up space, it was difficult to thread the strips together on the asphalt. And it was especially difficult to thread along the diagonal edges of each elevation. It also took a very long time to tighten each of the two screws on the wire clamps (because we did this by hand, not having access to or having considered using a drilling machine). This

was also the first time we saw the wire clamps on our installation. When buying materials, we were advised to use wire clamps with screws instead of the ones we used in our prototype, to make sure that they could last for the installation period. However, during the production period, we did not have time to test out how they looked. Seeing the wire clamps on the installation, I was very unhappy with the result because they were very visible and were nearly as thick as the wooden pieces. But it was too late to do anything about it at the time. Elias and I were, on the other hand, both very happy with the overall result of Urban Carpet on the traffic island. It had, as expected, a subtle visual expression. And its black texture reflected light very nicely throughout the day and night, exceeding our expectations.



## URBAN CARPET

Urban Carpet was installed from August 29 to September 5, 2018, on the traffic island in front of Aarhus Banegårdsplads in Aarhus, Denmark. I here present the installation with photos taken on September 3, 2018, by Rasmus Hjortshøj, architect, photographer and PhD fellow. The photos begin with a presentation of Urban Carpet in context and some of its details, such as the dark, textured surface, the 'wave' over the edge of the elevations and the weaving around elements on the traffic island. The photos continue with a depiction of the many people walking over the carpet and a picture that became quite defining of the installation period – myself fixing the wooden pieces of the carpet. The presentation concludes with a time-lapse, showing people's interactions with the carpet during approximately 30 minutes of photographing. I discuss this, and other effects of the installation, in the next section of the chapter.











## EFFECT EVALUATION OF URBAN CARPET

There were six striking effects of Urban Carpet that could be observed from the very first day of installation.

First, it made a distinctive sound as people walked over it. The sound was caused by the wooden pieces gently striking each other as people walked over the carpet, so it was a soft wooden 'clacking' sound. The sound changed depending on how fast people walked and whether they walked with a bicycle, suitcase or something else. We did not design or expect this effect, and we were very positively surprised by it. Although very quiet and not disturbing, the sound was noticeable when walking over the carpet, and people interacted with it by looking down, listening and, sometimes, tapping their feet to produce a rhythm. Second, people stood along the edge of Urban Carpet, not the edge of the traffic island when waiting for the green light. Because the installation was removed 50 cm from the edge of the road for safety, this effect actually made it safer for people to be on the road crossing. Furthermore, it also shows that the carpet had a visual and tactile effect of creating a clear border between the road and traffic island. Third, people tapped their feet on the carpet as they stood and waited for the green light. This was in part due to the sound that the carpet made, but it was, it seems, also caused by the texture and tactility of the surface of Urban Carpet. People would drag their feet along the installation as if feeling the surface, and some, especially children, would bend down and touch the charred wood.

Fourth, people spent a longer time on the island and walked across it. On this road crossing many people cross the road on the red light if there is no heavy traffic. However, it was visible that more (although not all) people waited for the green light when standing on the installation.



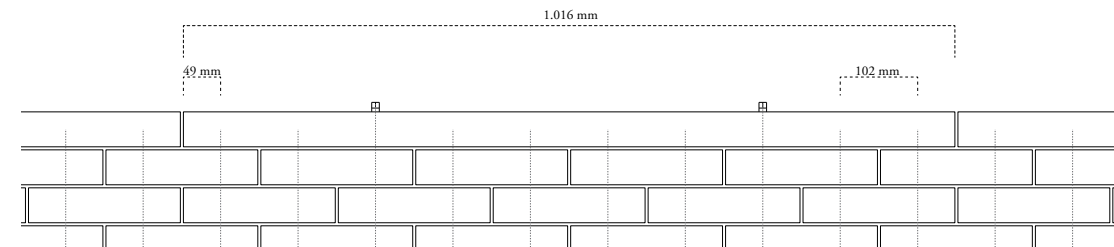
Some people also explored the installation and

traffic island by walking across it from elevation to elevation – something that never happened before or after installation of Urban Carpet. Fifth, people interacted with the carpet on the edges of the elevation by leaning their feet on the elevation or walking up and down the elevation while waiting for the green light. This was one of the most interesting observations because the cobblestones along the elevations were also there before the carpet, so people have always had an opportunity to interact with them; however, it was only with Urban Carpet that this affordance became perceived. Six, people spent time on the two island elevations, for instance while talking to a friend, on the phone or simply while waiting.





There were also two startling challenges of Urban Carpet that could already be observed by the second day of installation. First, some of the wooden pieces on the edge bent upwards. This was primarily due to the wire clamps that people pushed forward when stepping onto the installation (because they were as thick as the wooden pieces). By pushing the wire clamps forward, they bent upwards, pulling on the wire and bending the wooden piece on the edge. In some parts of the edge, the wire clamps got pulled off, resulting in the opposite effect – the wooden pieces on the edge being dragged off the installation. Second, some wooden pieces in the middle of the carpet cracked along the metal thread and made a dent in the carpet. In other places in the middle of the carpet, the wooden pieces simply broke in two. I addressed these challenges by replacing and re-weaving the broken wooden pieces from the middle, and continuously bending the front edge pieces downwards. Elias and I also met on September 3 to discuss a possible way to protect the edge. I suggested making a long strip of wood that would run along the edge, so that it would connect the small pieces but would not visually stand out. Elias made a drawing of it, but we did not have time to produce it, and we were also unsure whether it could solve the problem. Elias also suggested attaching the installation to the asphalt along the edge, but this would leave marks in and potentially damage the traffic island. With few other options, we resulted to buying plastic and metal strips in a carpentry store. However, when we tried to fit the strips on to the installation, we both agreed that it would not solve the problem and would visually stand out. We therefore decided, and promised the municipalities, that I would be on-site continuously fixing the carpet from September 3 and onwards.



Both the effects and challenges of Urban Carpet are reflected in the two reviews of the installation in Danish national newspapers. The installation was reviewed by Karsten Ifversen for Politiken and by Tina Byld for Jyllands Posten, who also interviewed me about the installation (Ifversen, 2018; Byld, 2018). Both reviews note the sensory qualities that the carpet adds to the urban space. Furthermore, in the Jyllands Posten interview, the focus is on how the installation draws attention to overlooked qualities on the traffic island (for instance, the bird boxes on the tree of the traffic island). However, both reviews also note and criticize the poor construction of the installation. This is clearly summarized in the Politiken review by Karsten Ifversen (freely translated from Danish).



*Urban Carpet is a more likable idea that seeks to add a sensory presence to a traffic island. The carpet is made of small pieces of charred wood woven together by a steel wire. The charred wood smells good and, when one walks over it, makes a pleasant sound like a large muffled xylophone. However, it is not at all durable enough for the massive use and the end pieces are already turned upwards, so that people can trip over them. The project fails on durability.*

It is precisely this failure of durability of Urban Carpet that ultimately led to citizen complaints and caused the early dismantling of the installation. Originally, I had planned and was given permission from Aarhus Municipality for Urban Carpet to be installed from August 26 until September 23, 2018. The official opening of the installation was on August 31, on the day of the opening of Aarhus Festuge. And the installation would continue to be on-site after the closure of Aarhus Festuge, on September 7. The intention with a long installation period stretching both before and after Aarhus Festuge was to have enough time to observe people's interactions with the installation in everyday circumstances, specifically, before and after a major annual city festival. The city festival, I reasoned, is a special context for understanding and interacting with an installation and so observing interactions in everyday circumstances was more accurate for evaluating its effect. However, the challenges of construction of the installation led to citizen complaints sent to Aarhus Municipality on August 30, 31 and September 1, 2018. First, Aarhus Municipality demanded that we continuously fix the issues with the carpet. Consequently, to repair the wooden pieces and re-weave the carpet, I was on-site on August 30 and 31, Elias was on-site on September 1 and 2, and I was again present on-site September 3, 4 and 5. However, on August 5, Aarhus Municipality demanded the immediate removal of the middle part of Urban Carpet, covering the asphalted part of the traffic island, due to safety concerns on the road crossing. After dismantling the middle part of Urban Carpet, Elias and I decided to keep the installation on the elevations of the island for another two weeks, to observe and compare the effects. The whole installation (including the strips from the elevations) was dismantled on September 17, 2018.



The municipalities had received only three citizen complaints about the installation, and they are so vague that it is difficult to consider them as a direct evaluation of Urban Carpet. Two of the complaints cite the wooden pieces that had broken, and which Elias and I were continuously fixing. The third complaint cites a general disapproval of the traffic island and carpet installation. None of the complaints cite any accidents or tripping over the wooden pieces, and I had also not observed any such episodes. Needless to say, however, both Elias and I agreed that the construction and durability were not

good enough by far and the use went beyond our expectations (for instance, an ambulance driving over the carpet to make a sharp U-turn on August 31, 2018).

As part of the effect evaluation of Urban Carpet, it is also important to mention that during the installation period I received a great deal of positive feedback. I was sent photos of the installation from people that I did not know. Also, I received emails describing the interesting experience of walking over wood on the crossing, how the experience is always different, depending on one's shoes, and that the installation invites one to walk across the traffic island to explore it. One person even asked Aarhus Festuge if Urban Carpet was for sale. And a Norwegian blog reached out to interview me about the installation. Overall, I interpret both the negative and positive feedback as a sign that the effect of the installation was noticeable. After all, it was perhaps not as subtle as I had originally envisioned.

#### OBSERVATIONS OF URBAN CARPET

To evaluate the effect of Urban Carpet in more detail (beyond the six effects, two challenges, reviews and feedback), I made observations. In particular, the observations were focused on registering the perceived affordances, ambiance and atmosphere, and any change therein during and after the installation. I did not have time to make in-depth observations before the installation due to our tight production schedule. And I also did not have time to conduct interviews following the Commented City Walks method to document how other people experienced the ambiance during and after the installation. Therefore, my observations are based on my own registration of the change in ambiance and atmosphere. I spent three full days observing Urban Carpet when it was installed, from September 3 to 5, then two days when it was installed only on the two elevations, on September 7 and 17, and finally one day observing the road crossing after the installation was completely dismantled, on October 24, 2018. The six days of observations stretched from September to October; however, I chose days with comparably similar, warm and dry weather. I observed from the outdoor chairs and tables outside of the nearby 7-11 kiosk. Sitting at these tables, I could see the whole crossroads and experience its ambiance. I also spent some time observing and taking photos on the island itself, standing on one of the elevations. However, I realized that this drew attention and people became more aware of themselves and interacted less with the installation. I also walked across the traffic island following the traffic light, to experience the installation in motion, like the other users of the road crossing. When walking over the traffic island, I realized just how little of the traffic island and installation one sees due to the many people in one's field of vision. It really is when first walking across the traffic island that Urban Carpet is experienced.

Throughout my observation period, on days with and without Urban Carpet, I experienced the ambiance of the road crossing as being very busy and stressful, primarily filled with sounds of bus traffic and people's conversations.



But, unlike at the Nobelparken crossing, this stressful situation was not unfriendly. During all days of observation, people joined me at the table and asked me about my work. We started conversations and they sometimes even joined me on walks over the installation. People's comments about the installation were positive, but I assume this was influenced by the nature of our conversations and that they knew that I had designed the installation. Furthermore, there were many groups of people going over the road crossing – families, friends, tourists – and this contributed to the lively and relaxed ambiance, albeit its fast pace and chaotic soundscape. The presence of tourists also introduced a diversity of both language and actions (tourists stopping to navigate on either side of the road crossing). There was also a noticeable age diversity – from children in kindergarten groups, with their school class or parents, to elderly people with walking aids – which contributed to the variation in actions. Although all people were walking across the road and not looking around them on the traffic island (especially after the installation was dismantled), their gestures and manner of walking were different. And this diversity of expression of the same action added a certain relaxed feeling to the ambiance. I did not experience Urban Carpet as a significant element of the ambiance. The stressed but friendly ambiance persisted after the dismantling of the installation. However, I did feel the absence of Urban Carpet. This absence was expressed, in particular, by the visual dissolvment of the traffic island in the background of the road crossing. Without the installation, there was nothing that made the traffic island stand out and my attention drifted past it to the cars, traffic light, people and urban surroundings. Furthermore, Urban Carpet contributed to an even bigger diversification of the ways in which people walked over the road and, possibly, I also felt the absence of these micro-actions.

My observations confirmed most of the immediately visible (and audible) effects of Urban Carpet – the sound and tactility of the carpet, and how this afforded people to look down, around, tap or slide their feet on it and walk across the traffic island. As soon as the middle part of Urban Carpet was dismantled, people stopped making exploratory movements (tapping, sliding, stepping) with their feet on the surface of the traffic island. It would seem that the asphalt either does not afford the same exploratory actions as Urban Carpet, or, more likely, that the change in surface (and sound) between Urban Carpet and the asphalted road, drew people's attention to their feet and body and this stimulated the explorative actions. This presumed shift in attention caused by Urban Carpet can also explain why people stopped looking down and around them and walking across the traffic island after the middle part of Urban Carpet was dismantled. They were now focused on the road ahead. Another evident effect of the installation confirmed by my observations was

the interactions with the edges of and the elevations on the traffic island. These interactions – leaning a foot against the edges or walking up and down along the edge or spending time on the elevations – persisted until Urban Carpet was completely dismantled. That is to say, while strips of Urban Carpet were still installed on the two elevations, people continued to interact with the cobblestone edge of the elevations and spend time on the elevations. When Urban Carpet was completely dismantled, these interactions stopped. This observation also supports the presumed shift in attention caused by the installation. Urban Carpet did not create the elevations – it simply followed the form of the island. So the affordance of walking up and down the edges of the elevations has always existed on the traffic island. However, without the black charred wooden surface of Urban Carpet on the two elevations, one's attention simply drifts past the elevations towards the road and asphalted middle part of the crossing, which dominates the visual field. One could say that Urban Carpet adds a solicitation to explore an existing affordance.

My observations also showed that one effect, which was striking at first sight, was, actually, not so evident. In the days following the installation of Urban Carpet, I noticed that people stood and waited for the green light along its edge. Specifically, Urban Carpet seemed to afford people to stand 50 cm away from the road, contributing to the safety of the road crossing. However, following the dismantling of the carpet, I observed that some people continued to stand closer to the middle of the island, away from the edge. Many people tended to stand on the middle of the traffic island. Following this understanding, the effect of standing away from the edge of the road cannot be attributed to Urban Carpet, but it was certainly strengthened by the installation. It seems possible that Urban Carpet created a visible line for orientation, along which most people stood waiting for the green light.

Observing Urban Carpet over a month also showed the effects of its interactions with the atmosphere – both with weather conditions and people's actions. Originally, Elias and I had expected that walking over the charred wooden surface would lead to black footsteps on the zebra crossing. This, however, did not happen. Nevertheless, the middle part of the carpet, where people walked, quickly became brown in color, more so than we had initially expected. Ultimately this had the same effect as the potential black footsteps on the crossing – it accentuated the area where people walked. The elevations remained black for much longer. However, with time and interactions with rain and wind, they also became brown. Furthermore, the delicate odor of burned wood was strongest after rain and when there was a slight wind. Also, grass started growing between the wooden pieces on the elevations. These weathering effects did not seem to impact upon people's attention or interactions with the carpet. In my





observations, for instance, I did not see anybody bending down to smell the carpet or pulling the grass out between the wooden pieces. Still, they may have contributed to some micro-movements or shifts in attention that are difficult to observe. From my first observations of Nobelparken I recall how footsteps in the snow covering the corner on one of the days added ever-changing details to observe. Potentially, the weathering effects of Urban Carpet also contributed to this on the Banegårdspladsen road crossing. Regardless of the effects on attention and actions, the weathering effects are very interesting properties of the material and construction of Urban Carpet. In my opinion, they contributed positively to the overall expression of the installation. The brown color was unique to each wooden piece, adding a nuance to the installation. And the grass growing through the wooden pieces was more visible than when growing between cobblestones because it contrasted the black color and was 'framed' by the bricks. A framing of urban nature, one could say.

In conclusion, my observations indicate that the striking effects of Urban Carpet are all linked to very subtle changes in behavior. So subtle, in fact, that it was difficult to photograph (the explorative behavior of people's feet, for instance). The changes were in *how* people did things, not in what they did. That is to say, people stood and waited for the green light on the traffic island with and without the installation, but their micro-movements (where they looked, how they explored the surface, whether they rested their foot on the elevations) changed. This change in micro-movements was so subtle that it did not impact the ambiance. My experience of the stressed but friendly ambiance at the road crossing did not change in the situations during and after installation of Urban Carpet. However, the feeling of the traffic island and the visual experience of the road crossing did change. Urban Carpet had a significant impact on drawing attention to the traffic island. Consequently, I would argue that my design vision of making an installation that interacted with the atmosphere, activated people's body and drew attention to the surroundings (and not to itself as an object) was realized.

Urban Carpet, then, is the design expression of my theoretical exploration. Thus, an evaluation of the effect of Urban Carpet is also an evaluation of my theoretical hypothesis. I had hypothesized that an activation of the body would cause a shift in the shared regime of attention and that this would bring the ambiance, atmosphere (and Anthropocene) and landscape of affordances to awareness and stimulate explorative behavior. Based on my observations, I would argue that Urban Carpet activated people's bodies by introducing a shift of sensory experience (a change of surface tactility) and new affordances (listening to the sound, tapping one's foot). This caused a shift in the shared regime of attention and stimulated people to perceive and explore the landscape of affordances on the traffic island (walking across, interacting with the elevations). However, based on my observations, it is impossible for me to evaluate whether the ambiance and atmosphere (and the Anthropocene) entered people's awareness. In future research, such evaluations could be made by a Commented City Walk with several people during and after the installation.

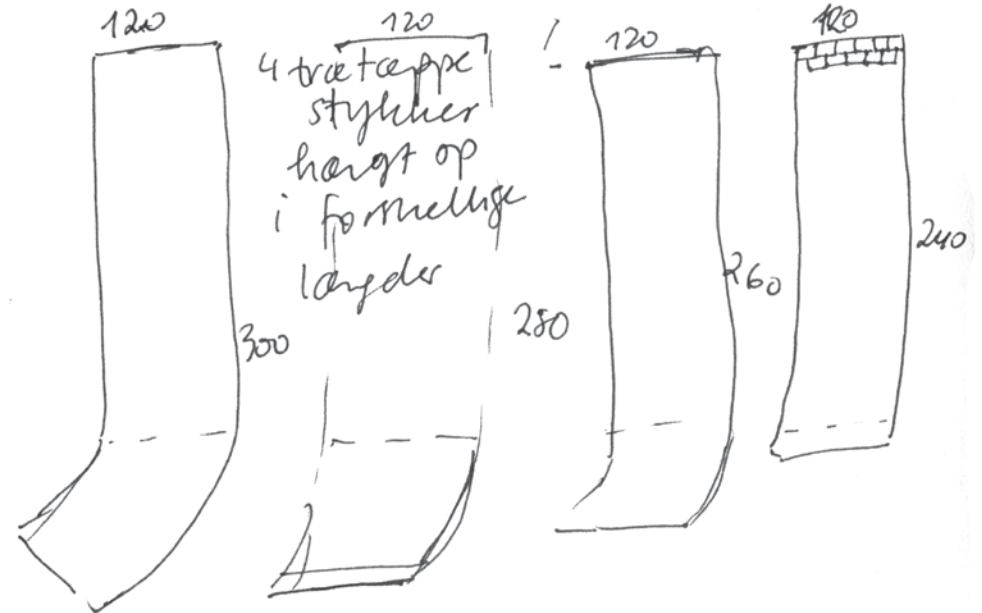


Moreover, an evaluation with comparative Commented City Walks would also nuance my understanding of whether and when an ambiance is changed. That is to say, did the small behavioral changes caused by Urban Carpet alter the ambiance (and introduce a new ambiance) or intensify the already existing ambiance? My hypothesis, based on my current observations, is that Urban Carpet did not create a new ambiance, but it did intensify the diversity of expression of the actions most defining of the ambiance at the road crossing – walking across the road and waiting on the traffic island. This implies that stimulating agency (i.e. the exploration of new actions and perception of the landscape of affordances) through design can be achieved by intensifying the expression of actions in accordance with the existing ambiance. This is new knowledge to better understand the link between the concepts of atmosphere/ambiance and affordances – and, on a larger scale, between architectural aesthetics and agency. Furthermore, it adds a new perspective to the design strategies of introducing tentativeness (e.g. Arakawa & Gins), friction (e.g. Olafur Eliasson), ambiguity (e.g. Sou Fujimoto) and enhancing the expression of the atmosphere (e.g. Sambuichi), all of which I have analyzed during the theoretical exploration of my design process.

Finally, although the concept of Anthropocene is difficult to identify in my observations of the effects of Urban Carpet, it is very apparent in my choice of site for the installation – a traffic island in the middle of a road crossing. In addition, it is apparent in my goal for the design project: to stimulate exploration of an overlooked urban space, rather than to make the space more comfortable or functional. Urban Carpet, I would argue, illustrates how the concept of the Anthropocene can stimulate a new agenda for design – attuning people’s sensibilities to invisible qualities of overlooked urban spaces.

All of my observations are focused on understanding the effect of Urban Carpet on people’s perception. Therefore, they do not contribute to an evaluation of Urban Carpet as an artifact and of its construction. To make such an evaluation and, with this, conclude my design process, I participated in the Forsk! exhibition at BLOX in Copenhagen.

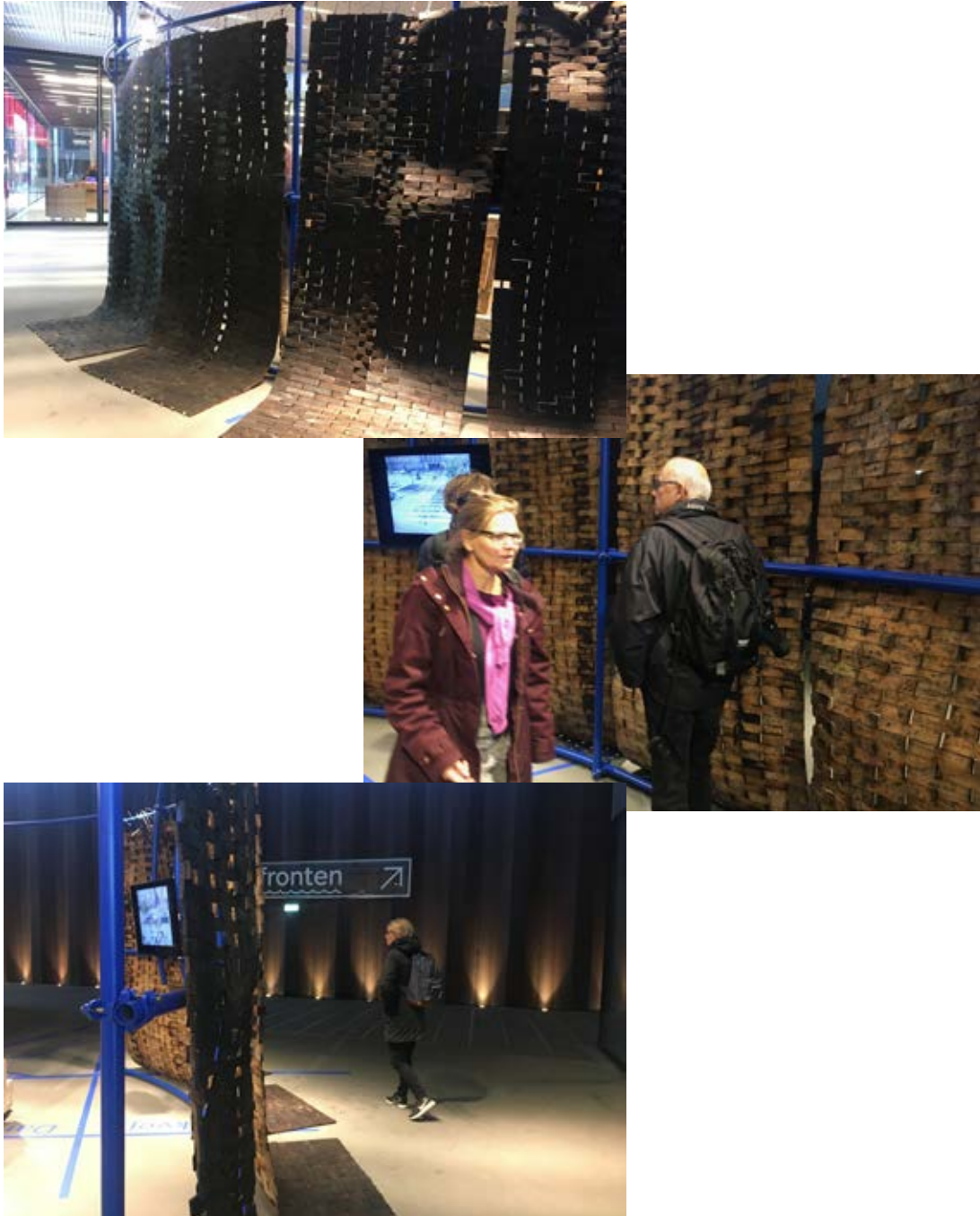
selection of the research at the Aarhus School of Architecture. It was curated by Karen Kjærgaard and ran from November 2 to December 20, 2018. I was invited to participate with Urban Carpet. The exhibition design was a metal structure in the middle of the room. Together with Karen Kjærgaard, we decided to exhibit Urban Carpet in four strips that would be hanging on the metal structure with a short tail along the ground. In this way, we assumed, the carpet would not afford to be stepped on or walked over (and its sound and tactility would, for instance, not be experienced), and its form would appear both when hanging over and lying flat on the floor. This would invite people to look at it and its construction in detail at eye level – something that was not possible at Banegårdspladsen. I prepared the four strips for the exhibition by reweaving the wooden pieces of Urban Carpet that were exhibited under Aarhus Festuge. In this way, the exhibited strips showed the weathering effects of the installation. I wove the four strips with help from Galina Skladtchikova.



I had expected that exhibiting the four strips of Urban Carpet as an object to look at (i.e. an artifact) would reveal some of its challenges of construction. However, taken out of context and without the wearing consequences of excessive use, these challenges remained out of sight. The wire clamps that created problems on Banegårdspladsen did not stand out in an exhibition context. The carpet, now hanging as a curtain, revealed the textured charred wood surface. Hanging on a metal structure in the middle of the room, it also revealed its underside – the side of the carpet that was lying on the ground and had not been charred. This side, even more so than its charred counterpart, exposed the weathering effects and subnatures of the traffic island. Each brick had weathered differently, with significant staining, dirt, debris and possibly



mold accumulating in the cracks of each wooden piece. However, whereas the charred wooden surface had a singular aesthetic expression that invited one to look closer at the weathering effects, the underside seemed chaotic and uninviting to study in detail. This observation confirmed the importance of the unifying expression that the charred surface gave to Urban Carpet. It is therefore possible to assume that without the aesthetic effect of Shou Sugi Ban (i.e. just by changing the surface from asphalt to wood), one would not have achieved the same effect on attention and explorative behavior.

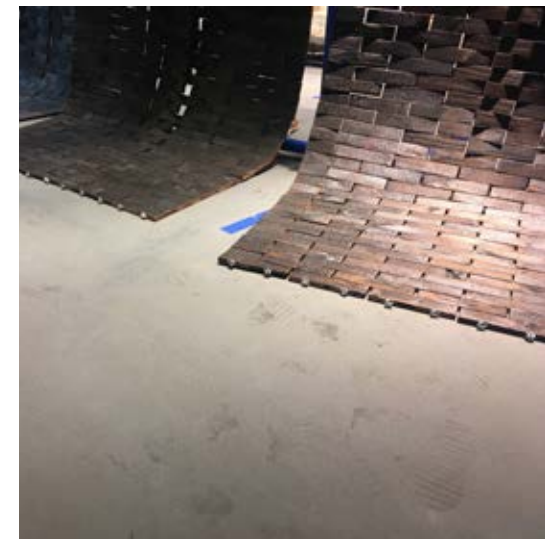


Furthermore, the many pieces of wood hanging as a curtain created holes through which one could peak through. Although my intention was to focus on the artifact, it was this potential for interaction that caught my interest. This, one could say, is the impact (and limitation) of including a theoretical exploration in a design process – it is very difficult for me to see the object and *not* to focus on the affordances. This is expressed in the following extract from the text that I wrote for the exhibition (Chebotareva, 2018d).

The installation consists of 10,000 small pieces of Douglas pine wood that are woven together using a steel wire. The small pieces of wood are burnt on the surface to give the carpet a coherent and subtle expression. This was inspired by the Japanese Shou Sugi Ban technique, where the surface of wood is burned to protect from moisture. In addition to the protective effect, the burned surface adds a sensory and interactive materiality to the carpet. The black color changes with use. The surface becomes slightly less black every time someone walks over the carpet. A brown-colored trace is created, just like when you walk over snow. Suddenly, you can see the effect that your movements have on urban space. Furthermore, just after a rainfall, and especially when the wind is blowing in the right direction, the burned surface gives off a subtle scent. The experience of the carpet is thus never the same. It develops together with the surroundings. In addition, the carpet is designed to make a different sound depending on how it is stepped on by the users. And because the carpet is just 15 mm thin, its form follows and accentuates the existing landscape.

Here, on show at DAC [BLOX, ed.], is just a small piece of the carpet. It is hanging from a wall. The carpet has become a curtain. Now, you can look through the holes between the pieces of wood. Possibly you might see something in the room that you had previously overlooked.

My focus on affordances of an object is not without reason. The affordances of Urban Carpet were also perceived at the exhibition. Although I expected people to look through the holes of the carpet and did not expect people to walk over it, the strips seem to have afforded the latter. People walked over the tails of the strips that were lying on the ground, and this left black footprints on the floor at the exhibition – an unexpected interaction and the witnessing of an effect that I had originally planned for Banegårdspladsen.



Finally, in conclusion of the design process, the exhibition of Urban Carpet in BLOX invited me to reflect on the issues of making an installation for an everyday context. Had my installation been developed for an exhibition context, I would not have run into the challenges of durability. However, I would also not have been able to test the effect of architectural aesthetics on agency in an everyday Anthropocene landscape. To avoid the challenges of durability of Urban Carpet, it would have been necessary to make a prototype of the installation. However, testing this durability would either have demanded specialized technical knowledge (how to stress-test the wooden construction digitally) or permission to install Urban Carpet for two days prior to the official installation opening. The latter, however, would seem highly unlikely due to the challenges I encountered in gaining permission for the installation. This reflection simply highlights the value of an even more diverse trans-disciplinary team to create an installation that is both durable, aesthetic and has an effect on perception in an everyday context.

#### ANALYSIS AND FOURTH PRELIMINARY CONCLUSION

The third stage in the design process is focused on the design of an artifact, external design critique and revisiting

the link between the three concepts. There is no theoretical exploration and only a brief design exploration. The design exploration was brief because my collaboration with municipalities added a time constraint (it was necessary to send a design proposal before their summer holidays). But the brevity is also rooted in the clearly defined design framework and criteria from my previous design stage. The design exploration began with knowledge about the material (charred wood), goal (drawing attention to surroundings and not the object), criteria (activating the body and having a subtle expression that does not disrupt function) and site regulations (2 cm height if removed 50 cm from the road). This only left the task of finding the correct form and construction for expressing the design criteria on the new site – the traffic island on the road crossing in front of Banegårdspladsen.

It is important to highlight that the design exploration phase was also short and efficient because I had established a shared vision with my new collaborator, Elias Melvin Christiansen. Although Elias and I also had different cultural-epistemic backgrounds (respectively, architecture and psychology/art), we were both PhD students in architecture, resulting in a similar current cultural-epistemic situation. This similarity was strengthened because Elias was also working with the theory of atmosphere. As a consequence of this, our collaboration succeeded in both questioning together (stage of transfer), exploring solutions based on our different backgrounds (translate) and merging the explorations through a common language to create the installation (transform). Furthermore, our installation is both evaluated in relation to my background in this thesis and in relation to Elias' background in his PhD thesis. Hence, there is a future potential for a holistic communication of the collected evaluations and new knowledge. My collaboration with the municipalities in this stage also did not have any barrier events (with the exception of measuring the traffic island by hand and

time constraints) and, thereby, contributed to an efficient design exploration.

The design exploration and realization were strongly influenced by the site analysis and construction trajectory. The site analysis was only spatial (that is to say, I did not conduct observations and registrations of atmosphere and affordances because the design criteria were already formulated and because we didn't have time). The road crossing at Banegårdspladsen has just one traffic island. This one island, however, is much larger in size than any of the traffic islands on the Randersvej – Nordre Ringgade crossroads. Accordingly, we adapted the 'Islands of Coal' idea. Since there was only one island, we could no longer work with framing the crossroads. Furthermore, the two elevations of this island were so far apart from each other that they did not surround the people walking by. In order to achieve a sensory effect, we therefore decided on a design that covered the whole surface of the traffic island and connected the two elevations. This surface could only be 2 cm in height and could not be mounted or drilled on to the asphalt, so it had to lie flat on it without any bulges. This resulted in the 'Urban Carpet' idea and construction – a thin carpet woven together from small pieces of charred wood that covered the whole traffic island and followed the landscape (though removed 50 cm from the road for safety). The process of production had a significant impact on the design details of this idea. For instance, the drilling machine and its properties influenced both the size of the individual pieces of wood and the final shape of the installation (smaller than originally designed to reduce the number of necessary holes). In this way, the drilling machine is an actant in the design trajectory, influencing the design process and outcome. Furthermore, due to limitations in budget, we could not afford working with the most durable material, oak, and had to settle for Douglas fir. And, finally, we did not have time to test out other alternatives to wire clamps for the edges of the installation.

These aspects of site and construction were also influential for the effects of the installation. The installation followed the existing landscape and, thereby, necessitated people to walk over it while crossing the road. The very low height made it nearly invisible from afar, thereby first having an impact on attention when people were on the traffic island. The low height also resulted in its very subtle aesthetic expression – it did not stand out as an object on the crossroads. It drew attention to the traffic island, not to itself. The size of the wooden pieces and weaving construction resulted in a muffled 'clacking' sound when people walked over the installation. This meant that it both gave off a faint sound and smell (due to the charred wood materiality), resulting in a multisensory effect. People interacted in particular with the sound of the installation by tapping their feet on the wooden surface. They also dragged their feet along the surface as if exploring its texture. The safety regulation of removing an installation 50 cm from the crossroads resulted in people standing along the edge of the installation, away from traffic. However, the aspects of construction also had negative effects. The non-durable wood type led to the wooden pieces breaking in the middle of the carpet. And the wire clamps resulted in the edges bending upwards. This, in turn, led to external critique, citizen complaints and the early dismantling of the installation.

I continued the external design evaluation by making observations on-site. I registered the atmosphere and perceived affordances during the installation, after the removal of the middle part of Urban Carpet and after its dismantling. My observations showed no change in ambiance in the three situations. But the observations exposed a change in attention. Without Urban Carpet, the traffic island completely blended with the background and slipped out of consideration. Furthermore, I discovered that the installation influenced people's perception of the affordances of walking across the traffic island, interacting with the cobblestone edge of the two elevations and spending time on the elevations. When the middle part of the installation was removed, people stopped walking across the traffic island, and, when the whole installation was removed, people stopped interacting with the cobblestone edge and spending time on the elevations. Furthermore, after the dismantling of the middle part of Urban Carpet, people did not tap their feet on the asphalt, drag their feet along the surface of the asphalt or stand along the same line 50 cm from the edge of the traffic island.

These observed effects made it clear that the installation had an effect on people's perception of affordances on the traffic island. It seems that this effect occurred through the introduction of new affordances (following the visual edge and tapping and dragging their feet on surface) which activated people's bodies (tactility, orientation, sound). This, in turn, created a shift in attention that exposed the landscape of affordances and stimulated explorative behavior (walking across the island, standing on elevations, interacting with the cobblestone edge). However, although I registered no difference in ambiance caused by Urban Carpet, I did not succeed in evaluating whether the shift in attention made people aware of the ambiance/atmosphere and global issues of the Anthropocene. To achieve this evaluation, it is thus necessary to conduct a Commented City Walk with several people before, during and after an installation. This is a potential avenue for future research. From my observations, however, I can conclude that charred wood is an interesting material for further research in this area because it interacts both with elements of the ambiance/atmosphere – the light (different nuances of black in different lighting), weather (smell), nature (grass) and people's actions (changing color where people walk). Furthermore, my observations also show that an installation can be so subtle in its aesthetic expression and impact on behavior that it does not change the ambiance, but only creates a shift of attention.

This external design evaluation led me to revise and nuance my understanding of the relation between perception of atmosphere and affordances (research question one). At the end of the second design stage, I arrived at the hypothesis that the ambiance maintains the shared regime of attention and thereby creates a field of affordances. Activating the body by drawing attention to other sensory phenomena in the surroundings could disrupt the shared regime of attention and expose both the ambiance and landscape of affordances. The third design stage nuances my hypothesis in the following way. A shift of attention can be created by introducing new affordances that accentuate the expressiveness of people's actions through multisensory effects. Urban Carpet achieved this by

adding multisensory expressiveness (sound) to the action of walking over the traffic island. In this way, it did not create new affordances for actions that were not already taking place on the traffic island. But it did create new affordances to increase the expressiveness of these actions. Furthermore, its draping form that followed the existing landscape might have added a solicitation to the affordances that were already there. For instance, it is possible to assume that it is more attractive to walk across the traffic island and interact with the cobblestone edge when it has a soft, wooden materiality. Thus, the specific form and materiality of the installation (which was developed in relation to the site and construction process, not based on theory) has a considerable impact on developing both atmosphere and affordance theory (research question three). It illustrates the relevance of registering which affordances impact the *how* of an action, and not only registering which affordances invite for *what* actions.

Overall, this stage in the design process has shown that an installation with a subtle aesthetic expression can change the micro-actions of people and also have a large and noticeable effect on attention and exploration in overlooked everyday environments. Furthermore, this stage also illustrates the relevance of interdisciplinary collaboration for design research in a public space. At the final exhibition I intended to expose the construction and material qualities of Urban Carpet to closer scrutiny. I did this by exhibiting it as an object without impact on behavior. However, the challenges of construction were not evident in the protected exhibition context. They only came forth when exposed to the everyday wear and tear on a public space. Accordingly, to address the issues of durability of Urban Carpet and rethink its construction in future research, it is necessary to have an engineer or expert in digital wood stress tests on the design team. This argument for the relevance of design research in public space and in interdisciplinary teams can be understood as a contribution to critical spatial practice (research question four). Finally, my focus on the effect of Urban Carpet on people's perception even in an exhibition context shows the impact of using theory in a design process (research question two). The theories color my understanding and evaluation of the installation in all stages of the design process.

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## CONCLUDING THE DESIGN PROCESS

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Following the conclusion of the third stage in my design process, I participated in two activities which contributed with different perspectives to understanding my design and theoretical exploration. First, in January 2019, together with Nacho Ruiz Allen, I was responsible for a History and Theory course for bachelor's students at the Aarhus School of Architecture. This course contributed to nuancing my theoretical exploration. Second, in March 2019, I contributed to the evaluation of the effect on people's perception of the Sense Envelope V installation by AREA Studio. This evaluation also contributed to nuancing my understanding of the theoretical exploration and design process. These activities – and their perspectives – mark the conclusion of the research through design process and suggest topics for future research.

### DISRUPTING ATMOSPHERES

The History and Theory course that I developed together with Nacho Ruiz

Allen was based on my research project and ran from January 17 to 31, 2019. It concluded with an exhibition of the students' work in the library at the Aarhus School of Architecture. To develop this course, I drew on my findings from the research through design process and on my theoretical framework, in particular, texts on atmosphere and ambiance. Nacho contextualized these findings and literature within architectural discourse and skillset. In the discursive contextualization, Nacho pointed out that my focus on the multisensory was an alternative to a visually dominant understanding of cities, and that it drew parallels to the depiction of urban environments in films and stage sets. With regards to the skillset and the final exhibition, Nacho suggested that the students work with photo manipulation and create a postcard of a manipulated atmosphere for the exhibition. Accordingly, for the curriculum, we matched each text on atmosphere with a visually dominant description of the urban by an architectural theorist and with a film for inspiration on how the urban can be depicted atmospherically (e.g. *Learning from Pop* by Denise Scott Brown (2000 [1971]) was matched to *Space, Place and Atmosphere* by Juhani Pallasmaa (2014) and to the film *Mulholland Drive* by David Lynch).

We began the course by asking the students to spend three minutes on a site and take notes of their experience. Then, on the next day, they were asked to return to the same site and spend three hours taking notes of their experience. As we expected, it was only on the second day that the students attuned to and registered the atmosphere. After this exercise, the students were grouped and asked to choose a site, register its atmosphere, analyze the site and atmosphere based on the reading list and, then, drawing inspiration from techniques used in film (e.g. color scheme, framing, exaggeration), photographically (or physically)

manipulate the atmosphere by enhancing and intensifying its defining elements. The manipulated atmosphere would then be presented on an A5 postcard made by the group for the exhibition. The students' registration of atmosphere and postcards showed a different side of Aarhus. Their postcards made visible the elusive feelings that usually escape our attention in the urban everyday. One group, for instance, focusing on Aarhus Ø, made a postcard of shattered plaster in the shape of a 'Home Sweet Home' doormat. Their intention was to highlight both the materiality of the construction sites on Aarhus Ø and to convey the feeling of shattered ideals of home that they registered on-site. Another student, focusing on a Starbucks café, wanted to convey the multisensory experience of the place, which was often drowned by the commercial visual language. His postcard was a 'painting' made of coffee on a paper that was water- and odor-absorbent. The postcard gave an unexpectedly multisensory experience of a Starbucks café. Other students chose to exhibit invisible materials from the site, such as sounds and smells – in one postcard, the atmosphere of Aarhus Rådhus is depicted by a xylophone of metal rods that mimics the sounds made by striking one's hand along the railings on-site. And others still made photomanipulations that strongly enhanced one element that the students' felt when registering the atmosphere on-site (e.g. mist or the feeling of isolation).





There are two interesting perspectives that this course contributed with to my research. First of all, the students' descriptions of a place in 3 minutes, and then 3 hours, raised an interesting question of time in relation to atmosphere. Many students expressed a feeling of discomfort and a feeling of being out of place when spending such a long time in one place that was not designed for this (e.g. an alleyway). I had not consciously considered this in my own design process. Although all of my observations of the atmosphere of a site took more than 3 hours, I had been used to doing this in the role of a researcher. The students' comments raised an interesting question – do places have time integrated into their design? And does spending more time than usual at a place disrupt its atmosphere? A second interesting perspective for my research emerged from the title of this course. I had at first suggested to title the course 'Reading the air'. However, following feedback from Nacho, we agreed to entitle the course 'Disrupting Atmospheres – the city as a multisensory field'. It is this renaming and the students' postcards that added a new question to my theoretical exploration: is an atmosphere disrupted when it is intensified? And how is this related to Urban Carpet? Did Urban Carpet, in fact, disrupt the ambiance by intensifying people's expression of actions? These thoughts are summarized in the following extract from an article that I wrote for the student Magazine Kårk in March 2019. I was invited by the students to write about the theme of the course and introduce their work (Chebotareva, 2019, p. 66-67)).

In everyday life, we are often not conscious of the effect of atmospheres on our mood and behavior. As we focus on the visual elements in our surroundings, the multisensory atmospheres remain unnoticed. We passively become part of our surroundings. Sometimes, a disruption is the only way to bring an atmosphere to our awareness.

In 1997, the Danish-Icelandic artist Olafur Eliasson created an

unannounced artwork for the second Johannesburg Biennale. By emptying a nearby water reservoir, Eliasson created a small stream of water flowing through a park and a parking lot before ending in a puddle in front of the entrance to the exhibition hall where a series of his photos were on show. The artwork, titled *Erosion*, forced visitors to jump over the puddle to get to the exhibition hall.

Such small disruptions are important in public space. By slightly disorienting our bodies, they awaken our senses and attune us to the surroundings. The atmosphere is brought to our attention. This makes it possible to discuss the invisible qualities of our surroundings.

Disruptions do not necessarily involve jumping. Sometimes, by simply staying in one place for a long time, one can reveal its atmosphere. This is especially true for places where we usually just spend a few minutes – such as crossroads, alleys, passage ways or record shops. We start to notice the sounds and smells, we become aware of our mood and the mood of our surroundings, we notice other species and details of the weather – spatial qualities that are usually overlooked.

Once the atmosphere is brought to our attention, it becomes possible to articulate the invisible qualities and convey the mood. Aarhus Ø is not only the buildings, but also the dust of construction sites and the feeling of shattering ideals of home, and Starbucks is not only the branded interior but also the smell and materiality of coffee. As these examples of students' work illustrate, there is more to a site than what meets our eyes. By talking about the invisible, we can come closer to discussing the overseen [overlooked, ed.] in our everyday and addressing the climatic and political in architecture.

This text and my reflections following the course go back to the beginning of my research project, to Olafur Eliasson's artwork 'Erosion' and the concept of frictional encounters. Throughout my project I had understood frictional encounters as necessarily being connected to a bodily disturbance and possible discomfort (like the tilted floors in the architecture of Arakawa & Gins). However, the students' experiences pointed out that spending more time than usual on a site can also be experienced as a frictional encounter that brings one's attention to the surroundings. Returning to Urban Carpet, it is possible to assume that the installation also invited people to spend more time on the traffic island (although I would argue that this is not the most evident effect of the installation). On a more abstract level, and with reference to atmosphere and the Anthropocene, it is relevant to consider how much time people spend in which places in a city, and how architecture might stimulate people to spend more time in overlooked places. This offers a new perspective to my theoretical work as it highlights that people's attention can be drawn to the atmosphere of a site by spending time there. In this way, spending time on a site is also a

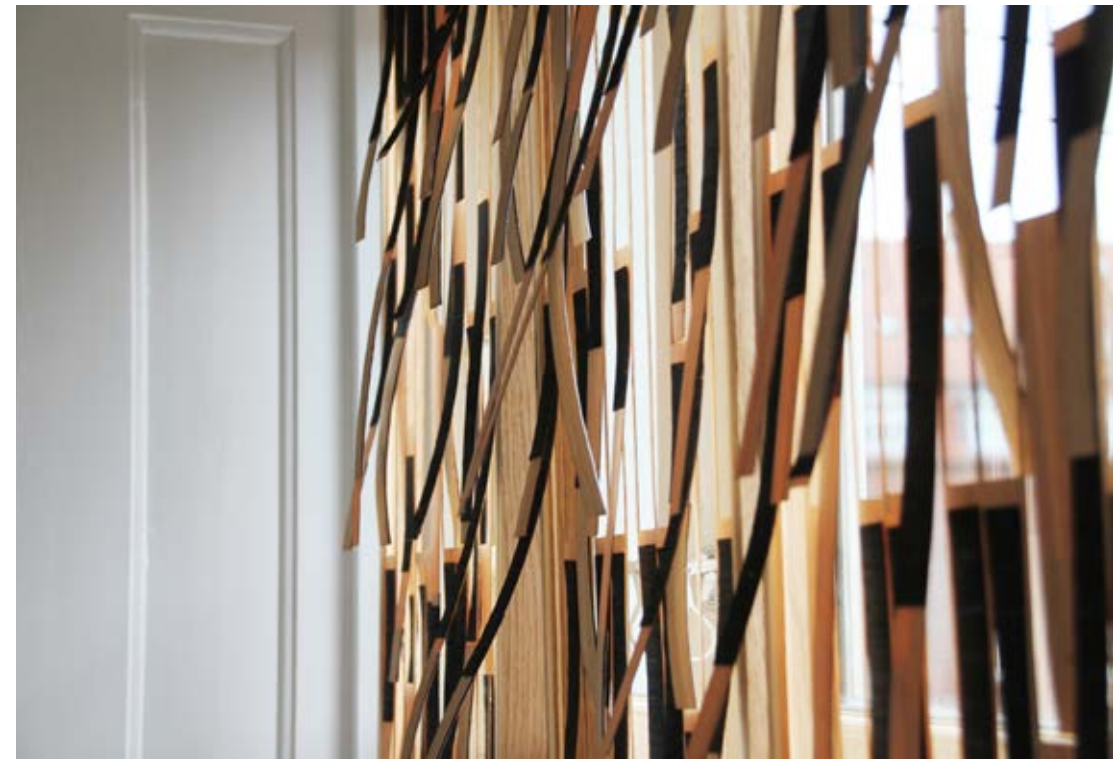
way to break the shared regime of attention. However, it is difficult to predict whether such a shift in attention would also stimulate an exploration of new action possibilities, as I have experimented with in my installation.

Furthermore, my reflections following the course nuance the understanding of enhancing an atmosphere. The students' postcards enhanced an element of the atmosphere to convey and intensify a feeling of the site. By isolating and intensifying this *feeling* they, arguably, disrupted the atmosphere. In contrast to this, Urban Carpet enhanced and diversified people's expression of the defining action of the ambiance. It intensified an element of the ambiance to stimulate a shift in attention, without changing the feeling of the site. The friendly if stressed feeling, following my observations, remained irrespective of the Urban Carpet installation. Thus, it is perhaps exactly this difference – between intensifying a feeling and enhancing the expression of an action – that separates the intensification of an atmosphere from the disruption of an atmosphere through design. Future research could explore this in more detail.

#### SENSE MEMBRANE

A second and last perspective for understanding my theoretical exploration and design process emerged from my evaluation of the effect of the installation Sense Envelope V by Isak Worre Foged and Anke Pasold from AREA studio. I was involved in this effect evaluation because I approached Isak in May 2017, just before I met Hiroshi Kato, with a suggestion to collaborate on designing an installation. AREA studio is specialized in installations that make atmospheric elements, in particular the thermal properties of a micro-climate, visible through materiality. However, their practice is based on registrations of atmosphere by digital sensors and their installations make visible thermal effects that are not always felt by people (a change of less than one degree Celsius in a room is very difficult to experience). I suggested to collaborate on an installation that would make visible the atmospheric effects that could be experienced by people (that is to say, atmospheric changes in a sensory range that is perceptible by people). The installation, I suggested, would draw people's attention to the changes in the atmosphere on-site that would otherwise escape their awareness. My hypothesis was, following my theoretical exploration, that such an awareness would draw people's attention to the landscape of affordances and stimulate exploration on-site. Isak agreed to collaborate with me and proposed to develop the next version of the installation Sense Envelope IV.

Sense Envelope IV, made by AREA studio in 2016, is a membrane that can be attached to windows indoors. The membrane is made of small and thin flaps of oak, which are each composed of three oak layers that are treated differently and painted with different colors (black towards the window and white on the outside). This results in the flaps bending and seemingly moving when the temperature changes (due to the sun hitting the window and heating the black painted layers) because the three oak layers have different heat sensitivities. Sense Envelope V, then, would interact not only with sunlight, but also with atmospheric changes that can be perceived by people (i.e. elements of the ambiance).



This project and the development of Sense Envelope V is interesting in itself. However, I describe it only briefly here as a perspective to my research because I was not directly involved in the design process for Sense Envelope V. The project was a further development of Sense Envelope IV and, because of this, many design choices were made in advance – such as materials and form. It was also decided in advance that the installation would be in the library of Københavns Erhvervsakademi (KEA) in Copenhagen and would be installed as a membrane onto the windows. Furthermore, there was only enough budget to make membranes for half of the windows in the room. Finally, the project was delayed several times and stretched beyond the time of my research through design process. It began in May 2017 and was first realized in March 2019. During these two years, due to scheduling challenges, Isak, Anke and I met just (approximately) eight times for short meetings. Despite our initial intention to collaborate on the design, the circumstances of the project led to my role in the process being to make observations of the site before and during the installation. I used the observations before the installation to identify perceptible changes in atmosphere that the membrane should react to and in order to document people's behavior. I used the observations during the installation to detect any changes in behavior and analyze the effect of the installation. Due to my role in this collaboration, I do not consider or describe this project as part of my research through design exploration (since I did not do any design experimentation). And the project did not have any impact on the design and theoretical explorations leading to the realization of Urban Carpet. However, my observations before and during the installation and reflections on the overall process contribute with an interesting perspective to understand my theoretical exploration and design of Urban Carpet.



My observations before the installation highlight the challenges of merging two different theoretical approaches of understanding atmosphere in the design of one installation. I entered the project with AREA studio knowing that we had different theoretical approaches to atmosphere. I approached atmosphere as the multisensory perception of the in-between, and I relied on observation to register the atmosphere of a site. My observations, as exemplified throughout my design process, are focused on the affective and sensory experience of the site as much as on the climatic phenomena. AREA studio approaches atmosphere from the perspective of invisible climatic phenomena that can be measured by sensors – the affective experience of a site is therefore not part of their registrations. The measurements taken by the sensors correspond to material properties (e.g. a humidity percentage and the reactions of materials to this value) and can be transformed to create logical rules for programming the movement of an artifact. These rules follow the logic of ‘if A, then B’. We began the project with me making observations of the felt atmosphere at the library, assuming that this would be enough to give input into the design process.

My observations of the library showed a relaxed atmosphere with many groups talking in subdued voices. I experienced disruptions of this atmosphere when groups started laughing and talking louder, when people ate lunch (which resulted in a change of odor) and when people walked fast (e.g. when running outside to answer a phone call). There was no explorative behavior at the library (for instance, looking through the books on the shelves or interacting with the plants in the room), people mostly just came in and went directly to sit at a table. Based on this, I suggested that the membrane should move when the disruptive elements occurred to draw people’s attention to the ambiance that they might otherwise not attend to and, thereby, possibly stimulate explorative behavior.

Isak was positive to this suggestion, but asked me to transform my observations into ‘if-then’ scenarios that could be used to program the movement of the membrane. This proved to be very difficult for me – the actions that disturbed

the atmosphere were difficult to articulate as a simple ‘if’ situation. For instance, the experience of someone walking fast needed to be described in quantifiable terms (walking with x meters a second) and the experience of a change of smell would also need to be described in quantifiable terms. Failing to transform my observations into scenarios, we attempted a different approach. Isak set up sensors in the room to digitally record the sound (in decibels), proximity to sensor, temperature, oxygen level and other atmospheric parameters in the room. On the days of recording, I would also register the atmosphere and any perceptible changes – I would note the exact time of the perceived change. Then, Isak would match the recorded sensory data to the time of my observation of a disruption in atmosphere. However, it turned out that there was no detectable pattern in the sensory data corresponding to my registrations of disruptions of atmosphere (e.g. they were not connected to a certain level of decibels or temperature change). Without a pattern, it was not possible to program the movement of the membrane. Ultimately, Isak attempted to program by setting different threshold values (especially on decibel levels) that sent an electrical stimulus and created a movement of the membrane.

The resulting installation was of a membrane composed of small flaps of oak, which reacted to and moved in response to thermal changes from sunlight on the window (like Sense Envelope IV). The novel aspect was that the whole membrane also moved perpendicular to the window frame and this movement was caused by the electrical stimuli sent when the sensors measured the set threshold values. The membrane could move in three positions – at 0, 45 and 90 degrees perpendicular to the window. Each position corresponded to a threshold in the sensory stimuli recorded by the sensors (and that corresponded somewhat to my observed changes of the atmosphere). There was a total of twelve membranes covering half of the windows in the room.



My observations during installation of Sense Envelope V showed changes in people’s behavior, but not in the way that I had initially envisioned. The membrane never succeeded in moving when an action that disturbed the atmosphere occurred. The movement was sometimes delayed by a few seconds (for instance, beginning to move when the person who ran out to talk on the phone was already

outside the room) and at other times it simply moved without a perceptible reason (possibly due to a change in decibels in the whole room that I could not perceive because the change was either too small or because I had become accustomed to a new, higher base level of acoustic stimuli). Furthermore, the membrane made an unexpected sound when it moved. This was caused by the rubber attachment of the membrane to the window. The noise (a squeaky glass sound) attracted people's attention to the membrane each time it moved. And, with this, it drew their attention away from the surroundings and atmosphere. For instance, if the membrane moved after a person had ran out of the library to talk on the phone, people would start looking closely at the membrane and not at the room or people's movements. People's comments also revealed that they did not understand why the membrane suddenly started moving. They felt it was an interesting object but its movements were very strange and, some people felt, annoying. Ultimately, the installation drew attention to itself as an ambiguous object, and not to the atmosphere and changes therein.



These observations of the Sense Envelope V give two interesting perspectives. First, my observations during the installation of Sense Envelope V seem to confirm that to draw attention to the body and surroundings and to stimulate explorative behavior, the installation must offer the possibility for direct bodily interaction. Just like in the first Forsk! exhibition where my tree trunks attracted attention to themselves as ambiguous objects, the membrane seemed to be perceived as an ambiguous object and have a similar effect. And, just like people could walk around my tree trunks, the Sense Envelope V did not afford direct interactions. Furthermore, the sound effect of the membrane was not connected to an interaction between a person and the installation – it was connected to the interaction between the membrane and the window. This is in contrast to the sound effect of Urban Carpet, which only appeared when one walked over it. In the two installations, the sound effects had the opposite results. These comparative reflections highlight the features of Urban Carpet that were defining for the effect on people's attention and explorative behavior, and the design elements that are defining for the expression of my

theoretical exploration. Namely, this defining feature is the direct multisensory interaction between the installation and a person that stimulates a bodily awareness and a shift in attention towards the surroundings and landscape of affordances. However, these reflections are preliminary and the squeaky sound of Sense Envelope V can be avoided in future prototypes. Furthermore, future research could explore whether objects that react to perceived changes in the atmosphere without a time delay can stimulate a shift of attention towards the surroundings without affording direct interaction. Such research could also explore in greater detail other formal and material qualities of an object that interact with changes in the atmosphere – what if, for instance, Sense Envelope was draped over a bookshelf and not the window? Or, what if Sense Envelope was made of a material with a smell that appeared when the membrane moved? Finally, what if Sense Envelope was made of fabric that moved in a less mechanical manner, swaying lightly in the air to avoid attracting attention to itself?

A second and final perspective inspired by my observations, especially from the beginning of the Sense Envelope V project, is the influence of my theoretical framework for understanding atmosphere and changes therein. The difficulties that we experienced in integrating my perceived changes in atmosphere with detectable changes by sensors is an interesting topic for further research. There is an exciting potential in linking observations of perceived changes of an atmosphere with patterns in sensory data recorded by digital sensors. Furthermore, if such a link is found and programmed to move an installation, it would be interesting to explore whether the movement of this installation would be perceived as meaningful and attract attention to the surroundings.

Aside from these perspectives for future research, the observations also highlight how my theoretical framework is defining for the design process and reflected in the materiality and form of Urban Carpet. My design process was based on enhancing atmosphere at the level of human perception to stimulate a bodily awareness and perception of the landscape of affordances. Had I been interested in atmospheric qualities that are detectable by sensors (but, most likely, not by humans) the installation would probably have been very different. Finally, this perspective illustrates that my theoretical exploration cannot be simply implemented to any design process – a design process that works with digital sensors and programming needs more work with and adaptation of the theoretical framework. This points to the importance of my research through design methodology, where I was responsible for and involved in both the theoretical and design explorations, continuously finding and expressing the links in between. My simultaneous conceptual and formal experimentation led to both new design knowledge and the advancement of theories of atmosphere and affordances.



This conclusive part of my design trajectory is a contextualization of my conceptual and design explorations.

In the previous design stage, the concept and design explorations were contextualized in relation to the theories of affordances and atmosphere. Here, the explorations are contextualized through my tactic of collaborating with an architect. The two collaborations of this part in my design trajectory were not based on developing a design together. The collaborations were based on a conversation that allowed me to understand the assumptions in my design process and, thereby, gave a deeper and broader understanding of the subject. This deeper understanding, in turn, led to identifying areas for future research.

The first collaboration with Nacho Ruiz Allen and students taking the History and Theory Course elucidated two assumptions. First, that spending time on a site and observing it for a longer time can be understood as an activity that creates a disruption of the ambiance. Spending time on a site stimulates a shift in the researcher's attention, thereby breaking the shared regime of attention and bringing the atmosphere to awareness. I had not previously considered this because I was trained to make observations and assumed that this activity did not disturb the ambiance. Research observations had become a professional habit for me. Becoming aware of this assumption led me to consider the importance of time in relation to awareness of atmosphere and ambiance. Future research could explore whether spending time in a location stimulates explorative behavior and the perception of the landscape of affordances. Moreover, future research could explore whether spending time in overlooked urban sites could sensitize people to climatic fluctuations and issues of the Anthropocene. The second assumption that was revealed in this collaboration was in regard to different intensifications of an atmosphere. Most students chose to intensify the feeling of their chosen site. Their intensification of the feeling led to disrupting the atmosphere of the site (at least in their postcards). In my research, on the other hand, I had studied precedent projects that intensified the expression of climate phenomena (e.g. Hiroshi Sambuichi) and Urban Carpet intensified the expensiveness of an action. Neither Urban Carpet or Sambuichi's architecture disrupt the atmosphere. I had not considered or explored design that intensified the feeling of a site. Thus, becoming aware of this assumption led me to consider another interesting topic for future research – how is intensifying the affective qualities of an atmosphere different to intensifying the expressiveness of an action or climate phenomena? And, specifically, why does this lead to different effects on perception and the disruption of an atmosphere? Finally, my collaboration with Nacho Ruiz Allen also revealed that a focus on atmosphere challenges the visually-dominated discourse for understanding of cities – a perspective I had not considered in my theoretical exploration.

My second collaboration and conversation with Isak Worre Foged and Anke Pasold from AREA studio illuminated another assumption of my research through design process. In our conversations I realized that my project does not address many climatic aspects of atmosphere because they are not perceptible

for humans. This highlights my assumption about working on the human scale to stimulate agency with architectural aesthetics. Furthermore, it also reveals that my observation-based registration of atmosphere is difficult to integrate with a sensor-based registration. My human-scale approach to atmosphere also had an impact on my design choices. For instance, I choose materials and a form that afforded direct, multisensory interactions. This was different to Sense Membrane V. The differences in our theoretical approaches to atmosphere also illustrate a barrier event for our collaboration. It was difficult to translate the shared vision into the design of an artifact because our explorations of the vision were based on very different knowledge and language. In addition, there were technological difficulties in detecting a pattern in my observed registration of atmosphere that could drive the mechanical movement of a membrane. Overall, the differences in our approach to atmosphere open up another interesting area for future research. Specifically, how and whether is it possible to integrate the different approaches to working with atmosphere in architecture. The potential of such an integration could lead to design innovation addressing climatic phenomena on both human and non-human scale. Working with both scales is important for addressing the vital issues of the Anthropocene.

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## CONCLUSION

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In this thesis I have presented my exploration of how architectural aesthetics can catalyze agency. I have addressed both agency and aesthetics from the perspective of perception. Specifically, I used the theory of atmosphere to understand architectural aesthetics as multisensory and affective perception, and I used the theory of affordances to understand agency as the perception of new possibilities for action. My exploration followed the method of research through design. Following this understanding, the empirical part of my research consists of my reflections on and analysis of a design process in which I explored the relation between the theories of atmosphere and affordances and the concept of the Anthropocene. The design process culminated with the realization of an installation that expressed my theoretical exploration and assumptions. The installation was entitled Urban Carpet and designed in collaboration with the architect Elias Melvin Christiansen.

Urban Carpet was a thin carpet of small pieces of charred wood woven together to cover the traffic island on the road crossing in front of Aarhus Banegårdspladsen in Aarhus, Denmark. In my evaluation of the installation, my focus was on understanding whether the installation gave rise to multisensory perception (i.e. atmosphere, aesthetics) that led to the perception of new possibilities for action (i.e. new affordances, agency) in an overlooked urban site (i.e. the Anthropocene). The results showed that people interacted with the surface of and sound made by the installation by tapping and dragging their feet along the surface. These multisensory interactions enhanced the expression of the most defining action of the site – walking across the traffic island. Furthermore, these multisensory interactions prompted people to walk across the traffic island, interact with the edges of the two elevations on the traffic island, and stand along the edge of the installation. Overall, it is possible to conclude that Urban Carpet stimulated agency through aesthetics because people perceived new opportunities for action after the installation stimulated multisensory perception. An important subconclusion is that the multisensory interactions (aesthetics) need to be so subtle that they enhance the expressiveness of people's actions and stimulate explorative behavior *without* disrupting the function of the site.

In this chapter I unfold this overall conclusion in relation to my four research questions. The outcome of my design process and evaluation of the installation

offers a perspective on the link between atmosphere and perception of affordances, and new knowledge on how the concepts of atmosphere, affordances and the Anthropocene can drive a design process and how a design process can inform conceptual analysis. Perception is at the heart of my research topic, design exploration and evaluation of the installation. My approach to aesthetics and agency from the perspective of perception offers a new angle to the debate about ethics and aesthetics in architecture and to critical spatial practice. In the following sections I elaborate on this by answering each of my research questions. In answering each question, I also offer ideas for future research.

#### THE RELATION BETWEEN ATMOSPHERE AND THE PERCEPTION OF AFFORDANCES.

My first research question is: What is the relation between the atmosphere and the perception of affordances? Hereunder, can becoming aware of the atmosphere stimulate the

exploration and perception of new affordances?

My answer to this question is in part based on a theoretical exploration and hypothesis formulated during the design process and in part based on my evaluation of the effect of Urban Carpet. I begin my answer with a brief summary of the two concepts.

Atmosphere is a term that refers to the quasi-object *through* which perception takes place. In perception theory, atmosphere is understood as the multisensory and affective tone of the surroundings, tincturing all things and people with the same mood (Böhme, 1993). Atmosphere is most often perceived subconsciously. In the natural sciences, atmosphere refers to the air and its chemical composition, while in the social sciences, atmosphere (often referred to as *ambiance* in this research) addresses the mediated aspects and air-design of the surroundings that often have a political or commercial interest for behavioral control (Thibaud, 2015; Roquet, 2016). In arts and architecture, atmosphere concerns all of the above and is understood as aesthetics. Design research explores how such aesthetics can be achieved through materials and form that enhance the multisensory and affective experience of a site (Zumthor, 2006), make the invisible air perceptible (as in the architecture of Hiroshi Sambuichi) or draw attention to the overlooked socio-political aspects (Gissen, 2012). In my theoretical exploration, I was interested in understanding the impact of all these atmospheric qualities on the perception of affordances. And in my design exploration I was interested in finding strategies for working with atmosphere to stimulate the perception of new affordances.

According to the ecological theory of perception, affordances are perceived invitations for actions in the surroundings (Gibson, 1986[1979]). Any object may have innumerable affordances, but only some of these are perceived at any given time by an individual. The perceived affordances are referred to as the field of affordances, while all existing affordances are referred to as the landscape of affordances. Research in ecological theory of perception

attributes what affordances are perceived to the individual's current needs and skills and/or to the socio-cultural situation (Ramstead, Veissière & Kirmayer, 2016). The socio-cultural situation creates a shared regime of attention that aligns people's perception of affordances. New affordances are perceived in playful and explorative behavior where objects and environments are approached from new perspectives. Such behavior is common in children. Adults, however, rarely engage in explorative behavior due to their more fixed habits and routines. Explorative behavior has the potential to challenge habits and can be stimulated through a design that activates the body and senses by creating a slight imbalance and encouraging us to explore the surroundings anew (Baron, 2008). In my theoretical exploration I analyzed how atmosphere could be understood as an environmental factor that influences the perception of affordances. And in my design exploration I was interested in combining the strategy of activating the body to stimulate explorative behavior with the strategies of working with atmosphere.

My theoretical and design explorations were primarily based on observations of perceived affordances and registration of atmosphere at a large crossroads in Aarhus, Denmark. My first observation showed that many affordances on one of the corners of the crossroads were not being perceived (e.g. the affordance of sitting on a bench) and that the atmosphere of the crossroads (e.g. smells and sounds of traffic) spread to all of the four corners of the crossroads. In the following theoretical and design exploration, I explored the connection between the atmosphere of the crossroads and the perception of affordances on the corner. After exploring several different hypotheses, I arrived at the hypothesis that the atmosphere maintains the shared regime of attention that creates the field of affordances by directing attention to a small selection of available sensory phenomena. I also hypothesized that this leads to a desensitization to traffic on the crossroads and, more abstractly, to global issues such as pollution. Furthermore, I hypothesized that by activating a person's body on the approach to an affordance, an installation could break the shared regime of attention and stimulate explorative behavior, thereby bringing the *ambiance* to awareness and exposing the landscape of affordances. Also, I realized that such explorative behavior of one's immediate surroundings might draw attention to global issues of the Anthropocene.

In my design exploration, I found three design strategies of working with atmosphere for this purpose: using a material that interacts both with climatic phenomena and people's activity, finding a form that necessitates direct interaction and activation of people's bodies, and achieving an overall subtle aesthetic expression so that the installation does not disturb the function of the site and draws attention to the surroundings and not to itself as an object. These design strategies were expressed in the design of the Urban Carpet installation. The installation was made with charred wood – a material that has visible weathering effects and interacts with people by giving off a faint smell and changing color from velvety black to brownish with wear and tear. The form of the installation was a very thin and flexible surface that draped over the existing landscape – this necessitated everybody crossing the road to

walk over and interact with the installation. Furthermore, the construction of the installation also interacted with people by making a sound when walked upon and with climatic phenomena by allowing grass to grow through the holes between the wooden pieces. Overall, the draping form and black materiality made the installation barely visible from a distance and walking over it did not disturb the function of the road crossing. Its shape was not ambiguous and it drew attention to the traffic island, not to itself as an object.

My observations of interactions with Urban Carpet confirm some of my hypotheses. First of all, the installation did not stand out on-site and it did not change the atmosphere because it was first noticeable when people walked over it. When people walked over it to cross the street, it made a faint sound. This visibly created a shift in people's attention and many explored the sound by tapping on it with their feet. Furthermore, people interacted with the materiality of the installation by drawing their feet over the surface. This shows that the installation succeeded in activating people's bodies through multisensory interactions. These interactions can be understood as the perception of new affordances that were introduced by the installation (e.g. tapping one's foot to make a sound). However, these new affordances did not invite the possibility for a new action, rather, they enhanced the multisensory expression of an already occurring action (walking across the traffic island). Following these interactions, people began to walk across the traffic island, interact with the edges of the elevations, spend time on the elevations, and stand along the edge of the installation. That is to say, people began to perceive and interact with the affordances that were already present on the traffic island before the installation (i.e. the cobblestone edge of the elevations was there before the installation). This shows that the shift in attention caused by the multisensory interactions stimulated people's explorative behavior and perception of the landscape of affordances. Furthermore, this suggests that the materiality of the installation also increased the solicitation of already existing affordances (i.e. it is more inviting to stand on the traffic island elevation when it is covered with charred wood). However, it was not possible for me to observe whether this shift in attention also stimulated people to become aware of the atmosphere and of global issues of the Anthropocene. To address this question, a future study could combine the method of Commented City Walks with the method of observing perceived affordances before, during and after an architectural installation that accentuates the multisensory expression of people's actions in public space.

Returning to my research question, my installation shows that the relation between atmosphere and perception of affordances lies in the potential of multisensory interactions on the approach to an affordance to accentuate the multisensory expressiveness of an action and activate the body. Such interactions stimulate explorative behavior and expose the landscape of affordances. These multisensory interactions can be stimulated by a design with affordances for the multisensory expression of an action. This adds a new perspective to the theory of affordances and offers an idea for future research. Whereas research in the ecological theory of perception is primarily focused

on the registration of perceived affordances and affordances on the *what* of actions (e.g. stepping on), my proposal is to study affordances on the *how* of actions (e.g. stepping *lightly* on). This is a new research focus on how and which affordances enhance the multisensory expression of an action. Furthermore, future research might explore other design strategies for stimulating a shift in attention that encourages explorative behavior and exposes the landscape of affordances. My installation also shows that design strategies working with atmosphere may enhance the solicitation of affordances that we overlook in everyday environments. Future research can explore the impact of this on perception and behavior in different overlooked urban sites.

My theoretical exploration also proposes that atmosphere maintains the shared regime of attention and that a shift in attention and explorative behavior can bring the atmosphere to awareness. To address this proposed link between the theories of affordances and atmosphere, however, more research is necessary that applies both the Commented City Walks method and observation of perceived affordances to analyze the effect of installations that accentuate the multisensory expressiveness of an action on the approach to an affordance. My proposition, in other words, is for new research to explore how an atmosphere can be brought to awareness. This proposition contributes with a new focus to research on atmosphere and ambiance, which is currently principally focused on exploring how an ambiance is perceived and can be staged (Chebotareva & Rask, 2018). Furthermore, future research that combines the Commented City Walks method with a registration of affordances in different locations can also contribute with new knowledge about the impact of atmosphere and ambiance on the perception of affordances, and, specifically, whether and how an atmosphere contributes to maintaining the shared regime of attention and field of affordances.

My observations of Urban Carpet also led to a new realization and hypothesis beyond my research question. The multisensory interactions created by the installation intensified the expression of the action that was most defining for the site (people walking across the road). Accordingly, it is possible to hypothesize that, by intensifying the multisensory expression of people's actions, architectural aesthetics can stimulate a shift in attention and expose the landscape of affordances and, thereby, stimulate agency. The action that is intensified must be already present on-site (i.e. it cannot be an affordance for a new action) and the expressiveness must be so subtle that it does not disturb the function on-site or change the existing atmosphere. In this way, it may not be necessary to become aware of the atmosphere to perceive new affordances – but it is necessary to create a shift in attention through multisensory interactions.

CONCEPT-DRIVEN RESEARCH  
THOUGH DESIGN PROCESS

My second research question is: How can the concepts of affordances, atmosphere and Anthropocene inform

and drive an architectural design process? Hereunder, how can a theoretical link between the three concepts be expressed through an installation?

The concepts of affordances, atmosphere and the Anthropocene influenced my design process in several ways. First, the concepts led to an abstract analysis and reading of the site. Second, the concepts led to a theoretical-driven precedent analysis to define design criteria and approach. And, third, the concepts provided a continuous framework for evaluating my design ideas. This can be summarized as a concept-driven design process. In the course of my design process, I had many different design ideas. It was, however, only Urban Carpet that expressed the theoretical link between the three concepts. I briefly addressed how the design of Urban Carpet expressed the theoretical assumption in my answer to research question one. Below, in my answer to research question two, I expand on this by describing the three ways that the concepts influenced my design process. I begin with a short resume of a concept-driven design process.

A concept-driven design process is reminiscent of any other design process; however, it is continuously evaluated in relation to the theoretical framework. The design concept is generated by creating a link between concepts that have not yet been explored together. Following this, the concept is explored and critiqued with regards to its theoretical uniqueness and how well it can be expressed in a designed artifact. The concept may be revised several times following this critique. Finally, the outcome of the process – the designed artifact – is also evaluated in relation to the theoretical framework and how well it expresses the theoretical assumptions. Working with and translating abstract concepts into specific design ideas also leads to slightly different design tactics. In my process, I used observational methods from the theories of atmosphere and affordances to analyze the site, analytical writing (peer-reviewed scientific articles) to evaluate my design concept in relation to the theoretical framework and I used metaphors to translate the generated concept in to design ideas.

My site analysis was based on three day-long observations on the crossroads at Nobelparken in Aarhus where I registered all perceived affordances and the atmosphere following a slightly adjusted version of the Commented City Walks method. This helped me to focus and organize data and recognize general values in people's behavior on-site. The concept of Anthropocene is not derived from social science theory and there is no method to 'register' the Anthropocene in the same way as atmosphere and affordances. However, the Anthropocene created a focus for my analysis, which also had an impact on my choice of site and design goal. The concept of the Anthropocene describes the current geological epoch where human activities are having a massive impact on global ecosystems. Despite the global impact of local actions, people are not sensitive to this effect. Following this understanding, the Anthropocene

concept highlights the importance of working with sites where the connection between local actions and global issues is particularly overlooked.

This concept-driven analysis of the site led me to, first, expand my site from the Nobelparken corner of the crossroads to the crossroads itself and, following this, to the traffic islands. The first expansion of site from the corner to the crossroads was based on my registration that the atmosphere of the corner was the same as the atmosphere of the crossroads. Therefore, to explore the link between the three concepts, it was necessary to work with the atmosphere of the crossroads in my design exploration. To understand how to work with the atmosphere of the crossroads, I used the theory of affordances and the concept of Anthropocene. First, a conceptual analysis led me to identify that activating a person's body on the approach to an affordance might (hypothetically) succeed in creating a shift in attention, stimulating explorative behavior and exposing the landscape of affordances. I then recognized that the traffic islands on the pedestrian crossings of the crossroads are on the approach to the affordances on the Nobelparken corner. This led me to identify the traffic islands as the site for my design installation. Analyzing the traffic islands from the perspective of the Anthropocene epoch drew my attention to the complex human-nonhuman entanglements on a crossroads that are overlooked in the daily habit of quickly walking past the traffic islands without looking around. This caused me to shift the design goal of my installation. Whereas I first wanted to stimulate exploration of affordances on the Nobelparken corner of the crossroads, I now sought to stimulate explorative behavior on the traffic islands themselves to sensitize and draw attention to the local manifestations of the global issues of the Anthropocene.

My concept-driven site analysis allowed me to identify a site for my design exploration that is unusual for and different from current architectural design practice. The traffic islands, for instance, are not measured and mapped on any available digital maps for architects. Traffic islands are usually only approached from the perspective of directing traffic activity and creating a safe pedestrian crossing of the road by traffic engineers. My site analysis identified a potential future activity – traffic islands as a place for people to become sensitized to the entanglement between local actions and global issues of the Anthropocene. This was only possible because the three concepts did not focus on the functional and spatial aspects of the site and surpassed all physical limitations (such as safety). Furthermore, the concept-driven site analysis also led me to identify the 'approach to an affordance' as an abstract site for research on the influence of atmosphere on the perception of affordances. This abstract site suggests that future research could explore this topic by identifying the 'approach to an affordance' in other locations and exploring how design installations on the approach to an affordance in other locations can stimulate explorative behavior. With this I contribute with a general statement and proposal of site for future research on architectural aesthetics as a catalyst of agency and research exploring the link between theory of affordances and theory of atmosphere.

Finally, identifying the traffic islands as a site for my design installation

without consideration of the spatial or functional aspects of the crossroads made it challenging to translate this concept into a design exploration. I used the design tactic of generative metaphors for this purpose. Specifically, I used the metaphor of a riverbank. On a riverbank, people often stand and look down along the river. Furthermore, if there is a bridge across the river, people stand on the middle of the bridge. This metaphor led to the visualization of the road as a river and to discussions of how the traffic islands can be considered a 'bridge' across the 'river'. This generative metaphor helped to imagine unorthodox design scenarios and connect two different locations to underline some similarities. Specifically, the metaphor drew attention to the difference in surfaces on the two locations and stimulated a design exploration of surface materiality and form.

My design exploration of surface materiality and form was also influenced by the concepts of atmosphere, affordances and the Anthropocene. The concept of the Anthropocene led me to identify the design strategy of making visible the overlooked aspects of the air (such as pollution) through materiality. And the concept of atmosphere led me to identify the design strategy of working with a material that interacted both with climatic phenomena and enhanced the multisensory and affective perception of people. I explored design precedents that worked with such materials. This process resulted in my choice to work with charred wood. Charred wood (the Japanese technique of Shou Sugi Ban) has a visible weathering effect, a deep-textured surface, a faint smell and a discoloring following use. Furthermore, charring wood produces coal, which is a symbol for the pollution in the Anthropocene. The concept of affordances led me to identify the design strategy of working with a form without canonical affordances and a form that necessitated direct interactions which activated the body and senses. According to the theory, such forms could stimulate explorative behavior. This led me to first explore designs with ambiguous shapes and, after this, shapes that necessitate direct interactions. My experimentation with ambiguous shapes is exemplified in my design exploration of sculptural rock-like forms of charred wood for the elevations of each traffic island and in my contribution of charred wood logs to the Forsk! exhibition. My experimentation with shapes that necessitate direct interactions resulted in the form of Urban Carpet – a thin layer of charred wood that people had to walk over to cross the road.

Throughout my design exploration, I tested many different design ideas. In this process, the three concepts provided a framework for continuous design evaluation and critique. Most of my ideas were abandoned because the design either did not express all of the three concepts or because the design did not have the effect of stimulating explorative behavior and exposing the landscape of affordances. An example of this is an early idea of changing the surface of the crossroads from asphalt to brick to change the materiality on the approach to an affordance. The idea was abandoned because the new brick surface would probably not activate the body or senses and it is therefore unlikely to stimulate explorative behavior. Another early idea was to create a framed view to the sea from one of the traffic islands. This was abandoned because, although it

stimulated explorative behavior on the traffic island, the framed sea view drew attention away from traffic, pollution and other local manifestations of the Anthropocene. And, finally, observing interactions with the charred tree logs at the Forsk! exhibition made it clear that they drew attention to themselves and not to the surroundings. It is first with the design of Urban Carpet that all three theoretical concepts (and the hypothesized link between them) were expressed. This was confirmed by my observations of the effect of the installation on perception (described in the answer to research question one).

In conclusion, the concepts of affordances, atmosphere and Anthropocene inform and drive an architectural design process by stimulating an abstract reading of the site that surpassed functional and spatial considerations. This allows to work on an unorthodox site and explore a future use-scenario. In my design process this led to the identification of traffic islands as an interesting site for stimulating explorative behavior that may bring people's attention to the impact of local actions on global ecosystems. It also led to identifying 'the approach to an affordance' as a general site of interest for future research on the relation between atmosphere and perception of affordances. Furthermore, the three concepts established a design goal (creating a shift in attention by activating a person's body and senses on the approach to an affordance), which provided a framework for evaluating design ideas.

#### DESIGN-DRIVEN CONCEPTUAL ANALYSIS

My third research question is: How can a design process contribute to a conceptual analysis of affordances,

atmosphere and Anthropocene? Hereunder, how can a design process lead to the theoretical development of the ecological approach to visual perception and theory of atmosphere?

My conceptual analysis was influenced by the process of designing and realizing an installation for a public space. Designing an installation demands adjusting abstract ideas to concrete situations and specific constraints. In my design process this occurred in three ways. First of all, I made a spatial site analysis in all three stages of my design exploration. In this process the abstract concepts were intertwined with the specific site and constraints of an everyday situation. These situational constraints, in turn, gave new ideas for conceptual analysis. Second, in the process of realizing the installation I adapted the design strategies that I identified in the conceptual analysis to the specific site. These modifications resulted in a more nuanced understanding of the link between the three concepts. Finally, the collaborations of my design process elucidated several of my theoretical assumptions. Becoming aware of these assumptions led me to identify new research directions. Overall, the design process illustrates a new bridging between research in perception theory and design research. This offers new knowledge to, in particular, the ecological theory of perception. For, whereas concept-driven design is a small but established research field in architecture, design-driven concept analysis has, to the best of my current knowledge, not been applied to develop perception theory in psychology.

Below I unfold the different ways in which my design process influenced my conceptual analysis and how this led me to identify new directions for research on the ecological approach to perception and theory of atmosphere.

My first spatial site analysis in stage one of my design exploration was focused on the Nobelparken corner. This analysis was very rough and my intention was to identify possibilities on-site to work with the concept of 'the vertical axis' and 'medium'. I had come to these concepts from my first theoretical exploration, and hypothesized that if my design installation were to interact with the medium (i.e. air) along the vertical axis, then people would become aware of the atmosphere and this would stimulate explorative behavior. In theory, this hypothesis seemed reasonable. However, in praxis on-site, I realized that it was unrealistic. First of all, to interact with the air along the vertical axis, my installation would need to be attached to the walls of Nobelparken. These walls, however, had many windows and a university logo. Furthermore, the walls did not stand out on-site. Instead, one's attention was drawn to the pedestrian crossings and the opposite corner of the crossroads. I attempted to bridge the concepts with the spatial site analysis in my design proposal by working with the surface of the crossroads instead of the surface of the walls. I suggested to change the materiality of the crossroads from asphalt to brick. Although the design proposal was abandoned because it did not express all three concepts, the focus on surfaces stayed with me for the rest of the design process. I realized that it was important to work with the materiality of surfaces for exploring the link between the concepts of atmosphere and affordances. This shifted my conceptual analysis from the concepts of 'vertical axis' and 'medium' to 'shared regimes of attention'.

The second spatial analysis took place at the end of stage one and beginning of stage two of the design process. Having shifted my focus from the vertical axis to the surface of the crossroads, I walked slowly around the crossroads along the pedestrian crossings. In this walk around the crossroads I spent time on the traffic islands and realized that it was possible to experience the crossroads in its totality by focusing on its atmosphere (sounds and movements) while waiting on the traffic islands. Furthermore, in the spatial analysis I noticed that the traffic islands formed a square around the crossroads and that each traffic island had two cobblestone elevations surrounding the asphalted part of the pedestrian crossing. The square formed by the traffic islands directed my attention to the atmosphere above the crossroads and I explored the potential of an installation on the traffic islands to direct airflow (reminiscent of my first idea to interact with the air along the walls of Nobelparken). Since this was technically not possible, I explored the potential of working with the cobblestone surface of the two elevations on each traffic island. These elevations surrounded a person that was walking past, and an installation that replaced the cobblestones with another material could give a sensory experience and visually enhance all of the traffic islands, drawing attention towards the crossroads. Finally, in my spatial analysis I also noticed that the traffic islands were highly important for safety on the crossroads. This led me to realize that the installation could not be too disruptive because this would cause a dangerous traffic situation. It needed

to be subtle and create a shift in attention that did not disturb the function of the site. Furthermore, I learned of the safety restrictions which allowed a maximum height of 2 cm if the installation was removed 50 cm from the road (and over 2 cm if the installation was removed over 1 m from the road).

This spatial analysis led to two design ideas. The first was to make a sound tunnel and framed sea view on two of the traffic islands. However, both of these ideas were abandoned because they drew attention away from the atmosphere of the crossroads. This design critique directed my conceptual analysis towards exploring the importance of the atmosphere in the immediate surroundings (and not a sea view which was further away). Focusing on the atmosphere of the immediate surroundings, in turn, shifted my attention to the traffic on the crossroads, global issues of the Anthropocene and multisensory bodily experiences. Furthermore, it was important to stimulate a shift in attention without disturbing the function of the crossroads. My second design idea was therefore more subtle. I proposed to replace the cobblestone surface of the elevations on the traffic islands with charred wood – a material that had a subtle aesthetic expression and deep texture and gave off a faint smell. This design exploration and idea gave two insights to my conceptual analysis. It suggested that there are different degrees of disturbing the shared regime of attention and that it is important to activate the body directly through multisensory experience to stimulate a shift in attention. These insights nuanced my conceptual and precedent analysis and led to the formulation of design criteria for the third stage of my design process. Overall, the spatial site analysis of my first and second stage in the design process created continuous critique and development of my conceptual analysis. The process is characterized by a back and forth between theoretical reading (and writing of articles) and working on-site.

In the third stage of my design process, the spatial site analysis was not related to a conceptual analysis – it was focused on finding ways to realize the formulated design criteria. This spatial analysis had a significant impact on the final design of Urban Carpet and, in this way, led to theoretical insights. I began by analyzing the new location for the installation on the pedestrian crossing in front of Banegårdspladsen in Aarhus. This pedestrian crossing had only one traffic island, which was much bigger than any of the islands on the crossroads by Nobelparken. The two elevations of this traffic island were so far apart from each other that they did not give an experience of surrounding a person walking across the road. Therefore, to design a multisensory experience on this site demanded an adaptation of the design strategy. My proposal was for the installation to cover the whole island. This would visually connect the two elevations and necessitate people to walk over it, thereby activating their body and giving a multisensory experience. Since the installation could only be 2 cm in height, this led to the idea of a flexible wooden membrane that would drape over the existing landscape. Observations of Urban Carpet showed that this draping shape accentuated the existing affordances of the traffic island and exposed the landscape of affordances.

The construction process of this thin wooden membrane led to further adaptations of the design strategy. First of all, to make a draping form, Elias Melvin Christiansen and I had to work with very small pieces of wood. And since the traffic island was very big in size, we needed to produce many of these wooden pieces. There was, however, a time constraint in our production, resulting in our decision to reduce the number of wooden pieces. This decision resulted in the sharp rectangular edge of the installation. Observations of the installation showed that this sharp edge created an orientation point along which people stood while waiting for the green light. Second, after experimenting with different construction techniques to make the draping form, we decided on a weaving technique where the metal wire threads through the small pieces of wood. This construction resulted in the wooden pieces being placed slightly askew to each other with a 4 mm space in between all wooden pieces. Because of this construction, the wooden pieces made a 'clacking' sound when someone walked over the installation. Observations of Urban Carpet showed that this sound was key to activating people's bodies and stimulating explorative behavior. Finally, it was also during the construction process that we decided to use Douglas fir and metal wire for the installation. These decisions, however, resulted in challenges of durability. The edge pieces of Urban Carpet bent upwards because the wire was pulled by people stepping onto the installation. And the middle pieces of the installation cracked because Douglas Fir was not durable enough, especially when there are two holes drilled through each wooden piece.

The spatial site analysis and construction process of the third stage in the design process led to three important theoretical insights. First of all, that the wooden 'clacking' sound (which was an unexpected result of the construction) can be understood as an affordance for the expressiveness of an action. Designing new affordances that enhance the multisensory expressiveness of an action can activate the body and stimulate explorative behavior. Following this, future research in the ecological theory of perception can explore affordances of the *how* of actions. Second, it revealed that the draping form of the installation (which resulted from the specific site analysis and safety regulations) can be understood as a solicitation of the already existing affordances. The materiality of the wooden membrane did not add these affordances (e.g. the edge of the elevations), but it made it more inviting to interact with these affordances. Future research can explore how materiality can stimulate the exploration of existing affordances on other overlooked urban locations – and how this impacts upon awareness of the atmosphere and global issues of the Anthropocene. Finally, the thin draping form of Urban Carpet also resulted in a subtle aesthetic expression that drew attention to the traffic island without disturbing the atmosphere and highlighting the installation as an object. However, as soon as the wooden pieces began to break and bend upwards, some people's attention was again directed to the installation as an object. And this led to complaints and its early dismantling. Theoretically, this highlights that there are different degrees of breaking the shared regime of attention. Disturbing experiences (such as broken wooden pieces) draw attention from the surroundings to the object, thereby disrupting the shared regime of attention and atmosphere.

Multisensory experiences that accentuate the expressiveness of an action (such as the clacking sound), on the other hand, draw attention to the surroundings and do not disturb the atmosphere. Future research in the ecological theory of perception and theory of atmosphere can explore this observation in more detail.

Finally, my collaboration with different architects throughout the design process revealed theoretical assumptions, the challenges of working with the three concepts, and directions for future research. My first collaboration with architect Hiroshi Kato illustrated that it is difficult to translate abstract concepts into a shared design vision and language. To find a common language, we used the strategy of a visual metaphor. This metaphor guided our design focus to the materiality of the surfaces on the crossroads (the metaphor is described in more detail in my answer to research question two). The collaboration highlighted the challenges of working with a concept-driven design process, but also illustrated how design can drive a conceptual analysis through spatial site analysis and design ideas. My collaboration with Nacho Ruiz Allen on the Disrupting Atmospheres student workshop elucidated the difference between drawing attention to an atmosphere and disrupting an atmosphere. The students worked with enhancing the feeling of a site, whereas I worked with enhancing the multisensory expression of an action to activate the body and create a shift in attention. The students' work led to the creation of a new atmosphere on the site, whereas my work did not change the atmosphere on-site. Future research could explore in greater detail the difference between disrupting and drawing attention to an atmosphere, and the difference between intensifying a feeling and intensifying the expressiveness of an action. Furthermore, the students also highlighted that simply spending more time on-site might lead to disrupting the atmosphere. Having been trained professionally as a researcher, I had not considered this effect of making observation studies. Future research could explore the importance of time in relation to awareness of atmosphere. Finally, my collaboration with Isak Worre Foged and Anke Pasold from AREA studio highlighted the impact of my specific theoretical framework. Although AREA studio also works with the design goal of making the atmosphere more perceptible, their theoretical framework is focused on the climatic aspects of atmosphere that interact with materials (the non-human scale). In contrast to this, my theoretical framework is focused on the multisensory aspects of the atmosphere that are perceptible on the human scale. This difference led to difficulties in finding a common design language. The Sense Membrane V by AREA studio does not necessitate direct multisensory interactions and it reacts to atmospheric fluctuations registered by digital sensors. Urban Carpet, on the other hand, interacted directly with people's bodies and had a weathering effect that was perceptible by people. This difference points to an area for future research – design processes that integrate and make perceptible both the human and non-human scale of atmospheric fluctuation.

In conclusion, my design process contributed to the conceptual analysis of affordances, atmosphere and Anthropocene by considering the abstract concepts in relation to the specific conditions of the site, construction process



and collaborations with architects. The specific conditions resulted in insights about, in particular, the concepts of affordances and atmosphere. There are five main insights that suggest areas for future research: the different degrees of breaking the shared regime of attention, the materiality and form of surfaces as affordances for the multisensory expression (the *how*) of an action, the materiality of everyday landscapes as a solicitation for exploring the landscape of affordances, the difference between intensifying and disrupting an atmosphere, and integrating the non-human and human aspects of atmosphere in one design process. These five insights from the design process are proposals for research that may lead to the theoretical development of the ecological approach to visual perception and theory of atmosphere. In this way, a design-driven conceptual analysis cannot confirm or disprove a scientific hypothesis (in contrast to a scientific conceptual analysis), but it can open up new trajectories for future theoretical development.

#### A CRITICAL SPATIAL PRACTICE AND ONTO-ETHICS

My fourth research question is: How can a design process that explores the concepts of affordances, atmosphere

and Anthropocene contribute to critical spatial practice? Hereunder, how does this contribute to the ethics-aesthetics discourse in architecture?

Critical spatial practice is a term to describe a design practice that surpasses the dualism between art and architecture by focusing on the critical aspect of both fields. Such a design practice is interdisciplinary, reflective and stimulates people's agency through a critique of normative attitudes. This criticality allows one to transform the present by imagining a different future. My design process contributes to critical spatial practice by using perception theories to critique normative attitudes of attention in public space and identifying a new critical aspect of architectural aesthetics. Specifically, I contribute to critical spatial practice in two ways. First, I contribute by illustrating the value of interdisciplinary collaboration to imagine a future that is different than the present. Second, I contribute by identifying traffic islands and the potential of architectural aesthetics to stimulate people to explore overlooked urban sites. Below I unfold both these contributions and discuss them in relation to architectural approaches to stimulating people's agency and the ethics-aesthetics debate.

Interdisciplinary collaboration is at the heart of my design process and research project. I not only collaborated with architects, but also worked in an interdisciplinary manner on my own. In the beginning of my project, for instance, I sought out to understand both the artwork 'Erosion' by Olafur Eliasson and the architectural design approach 'Empowerment of Aesthetics' by SLA through perception psychology and philosophy. Then, during my design process, I used spatial site analysis, precedent studies and design exploration with architects to further develop my understanding of the perception theories. Furthermore, I collaborated with municipality offices to gain safety permissions to realize my installation. I reacted to unanticipated events in my design trajectory; this

resulted in many different collaborators. Throughout all of these collaborations, the concepts of affordances, atmosphere and the Anthropocene have provided a focus and framework. The concept of affordances led me to understand that public spaces have a shared regime of attention that directs people's attention to a limited scope of available multisensory information and maintains habitual behavior. I reflected upon and critiqued this with the concepts of atmosphere and the Anthropocene. Following research on atmosphere, a shared regime of attention has a subconscious impact on individuals and it is often staged (as an *ambiance*) with commercial or political interests for behavioral control. The concept of the Anthropocene highlighted that habitual behavior and patterns of attention lead to a desensitization to the entanglement between local actions and global issues of the Anthropocene. Accordingly, challenging norms of attention in public space is a relevant area for future research in critical spatial practice.

I formulated a critique of normative attention in public space by challenging habitual behavior and insensitivity to the surroundings on a crossroads. Moreover, I suggested a different future by re-imagining the design of traffic islands. I identified traffic islands as a site where people can challenge their habits and become sensitized to the global issues of the Anthropocene. Traffic islands are an unorthodox site for architectural installations because they are usually only designed by traffic engineers to ensure road safety. In my design process I challenged this disciplinary distinction and was confronted with, among other things, a lack of available maps for architects where the traffic islands are included. The concepts of affordances and atmosphere prompted me to identify that traffic islands are on the approach to an affordance, and that architectural aesthetics on this location can increase multisensory awareness and stimulate explorative behavior. Following this, my installation for a traffic island, *Urban Carpet*, seeks neither to improve a functionality nor to express a subjective attitude. Instead, it is focused on stimulating people's perception and reflection. Thus, it surpasses the distinction between art, architecture, safety engineering *and* psychology. The installation had some challenges in durability and a future design process could benefit from including an engineer or technical wood expert in the design process itself. Future research on critical spatial practice might further develop alternative design ideas for traffic islands, or focus research on other urban sites that are dominated by a shared regime of attention which draws attention away from the global issues of the Anthropocene.

Architectural design strategies for stimulating agency are often based on designing objects that are ambiguous or incomplete and can be reinterpreted by a creative user. Another strand of research focuses on the design of spaces that create a productive discomfort and stimulate the user to continuously adapt to the space anew. In my design process, on the other hand, I identified the potential of architectural aesthetics to create a shift in attention in public space that stimulates agency through explorative behavior. I achieved this with *Urban Carpet*, which stimulated exploration by accentuating the multisensory expression of people's action of walking across the traffic island. Furthermore,

I identified that working with aesthetics on the approach to an affordance is important for stimulating agency. This is a new and alternative design strategy to stimulate agency through architecture. Future design research can explore other ways in which materiality and form can enhance the expression of people's actions to stimulate explorative behavior. Such explorations are especially relevant on sites that are overlooked in the Anthropocene.

In my proposed design strategy, architectural aesthetics are not an expression of a function or value. Instead aesthetics are used to intensify people's immersion in the world and develop their bodies' potential of perception. In this way, my installation stimulates ontogeny and my design strategy can be considered as an expression of ontoethics. This approach to ethics is not only about reducing resources – it is also about stimulating new relations between people and their surroundings. Ontoethics is concerned with processes of becoming and addresses the extent to which a body's potential is developed or diminished in interactions with architecture and the environment (Grosz, 2017). In my proposed design strategy, architectural aesthetics shift people's attention and reawaken their senses in locations that are overlooked in our habitual everyday. These multisensory interactions with architecture develop people's perception and stimulate agency. Thereby I suggest that architectural aesthetics can stimulate the formation of new relations and sensitivities between people and their surroundings, potentially leading to a higher environmental awareness and care for the global ecosystems through local actions. An unexpected effect of this design strategy is a reconsideration of the nature-culture relation in architectural design and research (Chebotareva & Rask, 2018). By stimulating explorative behavior and a new sensitivity in overlooked urban sites, architecture embraces the potential of subnatures and addresses the urgency of the issue of insensitivity in the Anthropocene epoch. Future research can explore how architecture can not only protect from climate, but also stimulate new relations to climate and atmosphere.

#### ARCHITECTURAL AESTHETICS AS A CATALYST OF AGENCY

I conclude this thesis with a summary of my conclusions on how architectural aesthetics can be understood as a catalyst of agency.

The main argument of this thesis is that aesthetic features in everyday environments that enhance the expression of people's actions are important because they can stimulate the perception of new action possibilities. Specifically, I put forth the hypothesis that multisensory interactions that accentuate the expressiveness of an action on the approach to an affordance can stimulate explorative behavior and the perception of new possibilities for action and, possibly, an increased sensitivity to the atmosphere. I confirmed this hypothesis by observing the effects on people's perception of my installation, Urban Carpet. Urban Carpet accentuated the expressiveness of people's actions by making a faint sound when people walked over it. This sound, in turn, stimulated people to explore the existing affordances in the surroundings that were not perceived

prior to the installation. Future research can expand, challenge and develop this hypothesis by exploring the effect of multisensory interactions that enhance the expressiveness of an action on the approach to an affordance in other locations. The second hypothesis that I formulated in my research project is that the atmosphere maintains the shared regime of attention and field of affordances by directing people's attention to a limited amount of the available sensory information in the surroundings. This hypothesis proposes a new link between the ecological theory of perception and the theory of atmosphere. Furthermore, I formulated the hypothesis that the shift in attention caused by multisensory interactions that accentuate the expressiveness of an action on the approach to an affordance can bring the atmosphere to awareness and potentially stimulate a reflection about global issues in local surroundings. Although I have not been able to prove or disprove these two hypotheses in my research project, they offer a new conceptual analysis and trajectories for future empirical research. In future research, the hypotheses can be explored by conducting both a registration of affordances and a Commented City Walk method with several participants before, during and after an installation that creates a shift in attention.

Finally, in my research through design process, I identified several interesting areas for future research. These areas are: affordances on the *how* of actions, materiality as solicitation for exploring the landscape of affordances, materiality on the approach to an affordance as catalyst of explorative behavior, explorative behavior on overlooked sites to sensitize people to global issues of the Anthropocene, bridging the non-human and human aspects of atmosphere through design, different degrees of breaking the shared regime of attention and strategies for bringing the atmosphere to awareness. Overall, my research project has illustrated how design exploration and conceptual analysis can enrich each other and proposed a new method of design-driven concept analysis. This interdisciplinary approach has shown a new potential for architectural aesthetics. When architectural aesthetics are approached as a means to accentuate people's actions through multisensory perception, they can stimulate a deeper immersion in the world. As I have illustrated in my research project, aesthetics is more than an expression of a function or communication of a value. Rather, architectural aesthetics can increase sensitivity to the environment, reveal new possibilities for actions and mediate new relations with the climate. Architectural aesthetics are a catalyst of agency.

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## AFTERWORD

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As an ending to this thesis, I would like to travel back to its very beginning. This return is intended to place the project within my personal trajectory and to contextualize the conclusions of the thesis within my own practice. Potentially, this may cast a light on a different aspect of the topic and inspire the application of my thesis conclusion in another domain.

Although it is difficult to mark a starting point of my interest in the topic of this thesis, one personal experience stands out as particularly influential. In 2003, on a school trip to London, I visited Tate Modern and saw Olafur Eliasson's installation, 'The Weather Project'. At that time, being just 13 years old, I did not know anything about the artist or the context of the artwork. But experiencing the giant sun in the Turbine Hall left a lasting impression on me. I was struck by the power of something I, at the time, could not put into words. I wondered how the artwork could have such a strong effect on my feelings and on the actions of myself and the other visitors. As many people have documented, visitors to the exhibition completely changed their behavior in the Turbine Hall, lying down on the floor and seemingly sunbathing underneath the installation.



This experience initiated my quest to understand and articulate the effect of aesthetics on perception and behavior, an exploration that has now reached its culmination with this thesis. I began this exploration by studying psychology at the University of Copenhagen to understand what, how and why people see, feel and act. I specialized in perception psychology and graduated with a Master's thesis that explored the link between the theory of affordances and the theory of atmosphere – it is this link that I further developed in this PhD thesis. Alongside my graduate studies in psychology, I joined and worked for Studio Olafur Eliasson from 2013 and until the beginning of my PhD research. I worked on different projects and, towards the end of my career at the studio, was fortunate enough to work with concept and design development for architectural projects, where I applied my

psychological knowledge. It is this work that lay the foundation for my research through design exploration of this thesis. Both my education in psychology and my first experience with integrating psychological concepts in design processes at Studio Olafur Eliasson provided the groundwork for my current research. However, it was a different project that inspired the formulation of the topic of this thesis – and it is this project that I wish to relate to my conclusion in this afterword.

Throughout my time at the studio, I was involved in the humanitarian non-profit project 121ethiopia. This project, initiated by Marianne Krogh Jensen and Olafur Eliasson, sought to improve the lives of children (orphans in particular) in Ethiopia by, among other things, renovating and supporting orphanages. The approach to renovation was very subtle and did not introduce any new technological solutions (i.e. advanced architecture or simple washing machines). The renovated orphanages, however, had an effect on the children, employees and visitors – on the how of their actions and feelings. There was a distinct air of calm and warmth in the orphanage, which was expressed in the actions of people. This effect, I felt, was akin to my experience of The Weather Project at the Tate. Both places transformed people's actions and feelings without any structural, technological or architectural change. Rather, the effect seemed to be in the air. I identified this similarity in the projects, but I also identified a huge distinction in their discourse. Whereas The Weather Project was acknowledged for and discussed in relation to its aesthetics (and atmosphere), but not in relation to its effect on people's actions, the 121ethiopia project and renovated orphanages were only discussed in relation to their ethics and organizational change. The subtle aesthetic and its strong effect on actions that I experienced in the orphanages was never articulated. It is precisely this difference that I sought out to explore and, potentially, challenge with my PhD project.

So, returning to the conclusions from my thesis, I would now argue that both The Weather Project and the 121ethiopia renovations of orphanages in Ethiopia enhanced the multisensory expression of people's actions and, thereby, drew attention to new possibilities for action and intensified the atmosphere and ambiance. In both projects, the aesthetics were not in the object but in the interactions between the object and people. And, precisely for this reason, I would argue that they both stimulate ontogeny and have an ontoethics approach to architecture. Intensifying the multisensory expressiveness of people's actions is both important at cutting-edge art exhibitions and in humanitarian work. In other words, aesthetic features are important in all everyday environments because increasing people's immersion in the world stimulates new relations and sensitivities. By sharing my experiences in this afterword, I seek to expand the relevance of research on the ontoethics of architecture and inspire future explorations of the role of aesthetics as a catalyst of agency.

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## ACKNOWLEDGEMENTS

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First of all, I would like to thank my mother, Galina Skladtchikova, and my partner, Karsten Opstrup Pedersen, for their unwavering support throughout this research process. I would not be where I am today without you. You are my most trusted sounding boards and best partners in discussion and life.

I would also like to thank the Aarhus School of Architecture for taking a chance on me and giving a psychologist an opportunity to conduct a PhD project in architecture. And, most importantly, I would like to thank my supervisors, Claus Peder Pedersen, Karen Olesen and Niels Albertsen, for supporting me in taking risks and not giving up despite the many ups and downs and unexpected turns along the way. I am truly grateful for the freedom and trust you have given me throughout the process. I also extend a big thank you to my first supervisors, the late Johan Verbeke, for pushing me to undertake a research through design project (which was not my original proposal), and Thomas Hilberth and Walter Unterrainer for challenging discussions that helped me define my own arguments.

I extend a special thank you to all people who have helped me throughout my research through design process. This PhD thesis could not have been completed without your help. First and foremost, a sincere thank you to Elias Melvin Christiansen for a great and efficient collaboration that was decisive for the realization of Urban Carpet. Furthermore, a special thank you to Ariane Lourie Harrison, Hiroshi Kato, Gaochao Zhang, Nina Rask, Jennie Schneider, Stefan Holst, Isak Worre Foged, Anke Pasold, Elizabeth Donovan, Anyanna Zimmermann, Anne Dall, Martin Nolan, Maj Dalsgaard, Stephen Willacy, the team at Brug Aarhus and the team of Aarhus Festuge.

Throughout my research process, I have received support and shared enriching conversations with many colleagues at the Aarhus School of Architecture. Thank you for this to Thomas Bo Jensen, Karen Kjærgaard, Udo Garritzmann, Mathias Meldgaard, Anne-Mette Boye, Angela Gigliotti, Tom Nielsen, Mads Tholstrup, Inge Vestergaard, Morten Daugaard, Stefan Darlan Boris, Jonathan Foote, Nacho Ruiz Allen, Heidi Merrild, Kasper Riis Jensen and many others. And for support and enriching conversations with friends and colleagues outside of the Aarhus School of Architecture, thank you to Jean-Paul Thibaud,

Gregoire Chelkoff, Suzel Balez, Harry Heft, Peter Connolly, Carsten Thau, Sofie Pelsmakers, Paul Roquet, Brett Simon Gabriel, Jacob Grönbech Jensen, Martha Sofie Kragh Arnesen and Christina Werner.

A heartfelt thank you to Masha Hupalo and Rasmus Hjortshøj for sharing this journey and making it so much more fun, inspiring and beautiful.

Finally, and with reference to my afterword, I would like to thank Marianne Krogh Jensen and Olafur Eliasson for generously sharing their knowledge, introducing me to Ethiopia and giving me the opportunity and support to explore the topic I am most passionate about – architectural aesthetics as a catalyst of agency.

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*Erosion by Olafur Eliasson*, unannounced artwork at Johannesburg Art Biennale 1997. Photo: Olafur Eliasson; Retrieved from: <https://olafureliasson.net/archive/artwork/WEK101671/erosion>

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*Empowerment of Aesthetics by SLA*, Danish Pavilion at Venice Architecture Biennale 2014. Photo: SLA; Retrieved from <https://www.sla.dk/en/projects/venice-biennale>

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*Blur Building by Diller Scofidio + Renfo*, installation for Swiss Expo. 2002.

Photo: Diller Scofidio + Renfo; Retrieved from <https://dac.dk/en/knowledgebase/architecture/blur-building/>

*Jade Eco Park by Philippe Rahm Architects*, landscape and architecture project in Taiwan, 2006. Photo: Philippe Rahm Architects; Retrieved from <https://transsolar.com/projects/taiwan-taichung-gateway-jade-ecopark-masterplan>

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*Reconstruction - Smoke by David Gissen*, conceptual project, 2006

Rendering: David Gissen, Retrieved from <https://htcexperiments.org/2008/09/17/project-06-reconstruction-smoke-2006/>

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*End Of Sitting by RAAAF*, experimental interior landscape project, 2014.

Photo: Jan Kempenaers; Retrieved from <https://divisare.com/projects/277315-raaaf-the-end-of-sitting>

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*Nobelparken*, Aarhus, Denmark, November 2016.

Photos: Polina Chebotareva

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*End Of Sitting by RAAAF*, experimental interior landscape project, 2014.

Photo: Jan Kempenaers; Retrieved from <https://divisare.com/projects/277315-raaaf-the-end-of-sitting>

*Empowerment of Aesthetics by SLA*, Danish Pavilion at Venice Architecture Biennale 2014.

Photo: SLA; Retrieved from <https://www.sla.dk/en/projects/venice-biennale>

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*Body Building Installation by Silje Pihlak with PART - Siim Tuksam*, 2015.

Photo: Tonu Tunnel; Copyright: Silje Pihlak; Retrieved from <http://www.sillepihlak.com/archives/636>

*Bränden BUS:STOP by Sou Fujimoto*, installation, 2014.

Photo: Yuri Palmin, Retrieved from <https://www.archdaily.com/506961/bus-stop-unveils-7-unusual-bus-shelters-by-world-class-architects>

*GaiaMotherTree by Ernesto Neto*, artwork at Zurich Central Station, 2018.

Photo: Mark Niedermann, Copyright: Fondation Beyeler; Retrieved from <https://www.designboom.com/art/ernesto-neto-gaiamothertree-zurich-07-03-2018/>

*The Julliard School, Diller Scofidio + Renfo + FXFOWLE*, New York City, 2009.

Photo: Iwan Baan; Retrieved from <https://www.archdaily.com/40448/the-julliard-school-diller-scofidio-renfo-architects-by-iwan-baan>

*Bridge-like structure and stair-case tower for Nobelparken corner*, arrows denoting where people would walk, 2016.

Two sketches: Polina Chebotareva.

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*Statens Museum for Kunst forhave by Karres En Brands and Polyform Arkitekter*, museum garden, Copenhagen, 2011.

Photo: Karres En Brands; Retrieved from <https://www.karresenbrands.com/project/statens-museum-for-kunst>

*Blur Building by Diller Scofidio + Renfo*, installation for Swiss Expo. 2002.

Photo: Norbert Aepli, Switzerland, Licensed under CC-BY-2.5; Retrieved from [https://commons.wikimedia.org/wiki/File:20020717\\_Expo\\_Yverdon\\_23.JPG](https://commons.wikimedia.org/wiki/File:20020717_Expo_Yverdon_23.JPG)

*Bymilen - SEB Bank by SLA and Lundgaard & Tranberg*, design and planning of urban space, Copenhagen, 2010.

Photo: SLA; Retrieved from <https://www.sla.dk/dk/projects/bymilen>

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*Atmospheres of the crossroads and Nobelparken corner intertwined* – the crossroads and Nobelparken corner atmospheres are the same, 2017.

Sketch: Polina Chebotareva.

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*Den uendelige bro by Gjøde & Partnere Arkitekter*, sculptural installation, Aarhus, 2015.

Photo: Gjøde & Partnere Arkitekter; Retrieved from <https://www.gpark.dk/uendeligbro.html>

*Selvika National Tourist Route by Reiulf Ramstad Arkitekter*, landscape architecture, Norway, 2012.

Photo: Reiulf Ramstad Arkitekter; Retrieved from <http://www.reiulframstadarchitects.com/selvika-national-tourist-route>

*A Path in the Forest by Transsolar and Tetsuo Kondo Architects*, landscape architecture, Tallinn, 2011.

Photo: Transsolar and Tetsuo Kondo Architects; Retrieved from <https://www.archdaily.com/551427/a-path-in-the-forest-transsolar-and-tetsuo-kondo-architects>

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*Staircase design along wall of Nobelparken on corner of crossroads*, 2017.

Sketches: Polina Chebotareva.

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*Museums in the City by David Gissen*, conceptual project, 2011.

Rendering: Victor Hadjikyriacou, Copyright: David Gissen; Retrieved from <https://htcexperiments.org/2011/07/09/museums-of-the-city/>

*Bioscleave House (Lifespan Extending Villa) by Arakawa & Gins*, East Hampton, 2008.

Photo: Reversible Destiny Foundation. Retrieved from <http://www.reversibledestiny.org/architecture/bioscleave-house-lifespan-extending-villa?view=slider>

*The function of the oblique by Architecture Principe*, diagram, 1966.

Diagram: Architecture Principe; Image modified by reversing the colors; Retrieved from <https://www.ccindex.info/iw/architecture-principe/>

*The Ethics of Dust: Alumix by Jorge Oteiro Pailos*, installation for Manifesta 7 European Contemporary Art Biennial, 2008.

Photo: Jorge Oteiro Pailos; Retrieved from: <http://www.oteropailos.com/the-ethics-of-dust-series#/the-ethics-of-dust-alumix/>

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*Brick surface on crossroads at Nobelparken*, conceptual design experiment, 2017.

Rendering: Jennie Schneider; Copyright: Polina Chebotareva.

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*Crossroads at Nobelparken*, Aarhus, July, 2017.

Photos: Hiroshi Kato.

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Sketches: Polina Chebotareva

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Sketches: Polina Chebotareva.

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Visualizations: Hiroshi Kato; Copyright: Polina Chebotareva.

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Sketches: Polina Chebotareva.

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Diagram: Polina Chebotareva.

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Photos: Polina Chebotareva.

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Sketches: Polina Chebotareva.

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*Islands of Coal on Nordre Ringgade-Randersvej crossroads (in yellow)*, Polina Chebotareva, design of traffic islands on Nordre Ringgade-Randersvej crossroads.

Visualization: Gaochao Zhang; Copyright: Polina Chebotareva.

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Sketches: Polina Chebotareva.

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Visualization: Hiroshi Kato; Copyright: Polina Chebotareva.

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Sketches: Hiroshi Kato; Copyright: Polina Chebotareva.

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*Wood-weaving of prototype*, Polina Chebotareva and Elias Melvin Christiansen installation for crossroads at Banegårdspladsen, Aarhus, 2018.

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Photos: Rasmus Hjortshøj; Copyright: Polina Chebotareva

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Photos: Thomas Lillevang; Copyright: Polina Chebotareva

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Photos: Polina Chebotareva

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Photos: Mads Blencker; Copyright: Polina Chebotareva.

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*Sense Envelope IV* by AREA Studio, experimental project, 2016.

Photos: AREA Studio. Retrieved from <http://www.studio-area.net/sense-iv/>

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Photos: Isak Worre Foged; Copyright: AREA Studio. Courtesy of AREA Studio.

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