Towards a More-than-Human Participatory Design Approach for Urban Lighting Design Practice

Anna Carena Mosler, University of Applied Sciences Hamburg (HAW Hamburg)
Carolin Liedtke, University of Applied Sciences Hamburg (HAW Hamburg)
Roland Greule, University of Applied Sciences Hamburg (HAW Hamburg)
Heike Bunte, Borough of Altona, Free and Hanseatic City of Hamburg

Kurzfassung

Ein artenübergreifender partizipativer Ansatz für die Lichtdesignpraxis ist noch nicht Standard und muss erst noch in Planungsprozesse integriert werden. Traditionelle Ansätze priorisieren in den allermeisten Fällen menschliche Bedürfnisse und vernachlässigen weitgehend andere Beteiligte des Ökosystems. Die Anerkennung des gleichen Wertes aller Ökosystemteilnehmer_innen bedarf einer dringend erforderlichen Dezentralisierung des Menschen.
Das zentrale Ziel besteht darin, den vorwiegend anthropozentrisch orientieren Ansatz zu überdenken, um zu einer umweltgerechteren partizipativen Planungspraxis zu gelangen.
Beschreibung der Innovation/»Best Practice«
Im Rahmen des Interreg-Nordseeprogramm Projektes DARKER SKY werden an acht Demonstrationsstandorten in Europa umweltgerechtere Beleuchtungsansätze umgesetzt. In zwei kollaborativen Workshops wurde eine Herangehensweise für gemeinsame Planungsprozesse an den Demonstrationsstandorten in Hamburg entwickelt. In die Workshops integriert war das Extended Reality (XR)-Tool PARTICLE. Als Arbeitsergebnis entstand eine Basis für eine umfassendere Vernetzung der Teilnehmer_innen untereinander.
An den Standorten in Hamburg wird untersucht, wie alle Teilnehmer_innen des Ökosystems in den partizipativen Prozess integriert werden können. Erkenntnisse aus der Workshop-Reihe legen nahe, dass ein umfassender Dialog zwischen den Beteiligten eine grundlegende Voraussetzung ist, um die Bedingungen für die Entwicklung eines artenübergreifenden partizipativen Planungsansatzes zu schaffen. Diese Neujustierung eröffnete Möglichkeiten, Perspektiven und Designstrategien zu entwickeln.

Das Projekt wird von der Europäischen Union im Rahmen des Interreg-Nordseeprogramms kofinanziert.

Abstract

A more-than-human participatory design approach for lighting design practice still needs to be integrated into planning processes. Traditional approaches often prioritize human needs and largely neglect other ecosystem members. Recognizing the equal value of all ecosystem participants requires an urgently needed decentering of human beings.
The central goal is to rethink the design approach as primarily anthropocentrically oriented to move towards a more environmentally just participatory design practice.
As part of the Interreg-North-Sea Program project DARKER SKY, more environmental-sound lighting approaches will be implemented at eight European demonstrator sites. Two collaborative workshops were conducted to develop an approach for joint planning processes at the demonstrator sites in Hamburg. The extended reality (XR) tool PARTICLE was incorporated throughout the workshops. The outcome provides a basis for more comprehensive networking among the participants.

At the sites in Hamburg, explorations are made on how all participants in the ecosystem can be involved in participatory design processes. Insights from the workshop-series suggest that an all-encompassing dialog among stakeholders is a fundamental prerequisite to creating the conditions for developing a more-than-human participatory design approach. This re-anchoring of the design process opened up possibilities to explore perspectives and design strategies.

The DARKER SKY project is co-funded by the European Union in the framework of the Interreg-North-Sea Program.

1 Introduction

The Elbe cycling and hiking path in Hamburg, Germany serves not only as a recreational space for humans but also as a habitat for a wide variety of other living beings, such as mammals, birds, insects, and plants. Let us acknowledge that this area is their home, too.
Taking this into account, how must we re-think lighting practices and planning processes?

This vision stands in stark contrast to the predominant contemporary lighting design practices, which adopt a human-centered perspective that prioritizes human needs. This view is based on the human exceptionalism paradigm, which places humans above all other species. Humans understand themselves as “users” whereas the environment is regarded as a resource for fulfilling human requirements. This results in a loss of connection to the environment. In particular, nocturnal environments are significantly altered by human activities. Robertson notes, "There is no other habitat we have degraded more than our darkness." (Robertson, 2023, p.x) The reasons for the widespread implementation of artificial light at night (ALAN) are e.g., to create a feeling of safety. Predominantly, strategies are employed that attempt to work *against* darkness rather than *with* it (Griffiths et al., 2024).

Human-centered approaches are fundamentally rooted in the following views:
- Humans are separated and independent from nature (human/nature dichotomy)
- Humans are superior to nature (anthropocentric domination)

The human/nature dichotomy is grounded in the belief that humans perceive themselves as separate from the environment. Anthropocentric domination refers to the perspective that humans are superior. This viewpoint fails to acknowledge the fundamental interrelationships and interdependencies between humans and their environments. This perspective often underpins design practices. Therefore, we propose a paradigm shift in design methodology that challenges this human-centered perspective. As Light et al. write, “We can design to unseat humans from the center of the universe and support a more equitable gaze.” (Light et al., 2017, p.728)
This article examines the implementation of a more-than-human design [1] framework for participatory lighting design workshops in pilot areas in Hamburg within the DARKER SKY project. The study is rooted in theoretical frameworks, specifically drawing upon Kym MacLaren's notion of *letting others be* and Karen Barad's concept of *intra-action.*

[1] Abram introduced the term *more-than-human* in the subtitle of his book “The Spell of the Sensuous as Perception and Language in a More-than-human World” (Abram, 1996). More-than-human design is a multidisciplinary field that calls into question the human-centered design orientation by expanding considerations beyond humans (Rosén, 2024).

The article is organized into six sections. Section 2 provides a brief introduction to the fundamental theoretical concepts. Section 3 outlines the DARKER SKY project, introduces the pilot sites in Hamburg, and describes the participatory workshop-series. Section 4 offers a non-exhaustive overview of current more-than-human design methods and outlines an approach for the pilot areas. Section 5 presents a brief discussion, followed by a summary and conclusion in Section 6.

2. Theoretical Framework

2.1 Letting other be

The philosopher Kym MacLaren introduced the notion of *letting others be* to conceptualize knowing processes. To know something is *letting it be*. MacLaren draws on philosopher and phenomenologist Maurice Merleau-Ponty's concept of *intercorporeality*, which refers to a non-analytic way of relating to others (Merleau-Ponty, 1968).
MacLaren illustrates this using Merleau-Ponty's example of someone watching a soccer match. The observer does not passively watch the game but is immersed in it, they "*inhabits* the players actions" (MacLaren, 2002, p.190). Notably, the observer does not perceive the other body and its actions as objects of perception, but is instead directed toward that with which the actions engage. MacLaren states, "It is by virtue of being swept up in the other's bodily attitude, in her bodily intending of the world, that we are ushered into a shared world." (MacLaren, 2002, p.191). Thus, being in other actions discloses meaning for us. MacLaren exemplifies this point by recounting her visit to a friend's farm and learning about horses through her friend's behavior *towards* them. However, even when we are engaged in the actions of others and a feeling of indistinctiveness arises, we are simultaneously in our own bodies. As MacLaren points out, "We are *there*, with the other, in her actions, while we are also here." (MacLaren, 2002, p.190)
MacLaren illustrates *letting others be* with the example of a horse and a horse trainer. The trainer trains the horse while disregarding its needs, seeing it as a way to make money and fails to see the horse in its "horseness" (De Jagher, 2019, p. 857). Ultimately, the horse breaks down (Maclaren, 2002). By seeing the horse in its "horseness" the trainer is required to avoid both overdetermination (e.g., domination) and underdetermination (e.g., disengagement). As De Jaegher and Di Paolo put it, disengagement will lead to "letting-go" rather than "letting-be" (De Jaegher & Di Paolo, 2021, p. 246).

2.2 Intra-action

The traditional concept of interaction assumes the pre-existence of distinct entities that engage with one another. In contrast, the notion of *intra-action* introduced by physicist and feminist theorist Karen Barad challenges this assumption.
Barad's theoretical framework posits that entities do not exist autonomously before they interact; rather, the entities emerge through the situated *intra-action* (Barad, 2007).
Likewise, as biologist and feminist theorist Donna Haraway puts it, "Beings do not preexist their relatings." (Haraway, 2003, p. 6) Consequently, at the fundamental level, entities can exist only in relation to one another and mutually constitute one another. As Barad puts it, "It is important to note that the 'distinct' agencies are only distinct in a relational, not an absolute, sense, that is, agencies are only distinct in relation to their mutual entanglement; they don't exist as individual elements." (Barad 2007, p. 33)

Notably, while these entities are mutually constitutive, they can still be analyzed, not as isolated phenomena, but in their interrelationship. A comprehensive understanding of one entity can only be achieved through its connection to another (Barad, 2007).

3 DARKER SKY project, the pilots site, and the workshop-series

The DARKER SKY (DKS) project aims to mitigate light pollution[2] and enhance biodiversity in the North Sea Area, encompassing partners from France, the Netherlands, Germany, and Denmark. The objectives of DKS are to provide municipalities and ports with innovative methodologies for measuring and monitoring light reduction solutions and co-design methods for the implementation of novel light reduction solutions.
The project will further seek to promote interdisciplinary and transnational collaboration with good practices and lighthouse demonstrators of environmentally-sound lighting techniques and systems. These will be implemented across eight sites within the pilot regions of Brest/FR, Groningen/NL, Friesland/NL, Lower Saxony/GER, and Hamburg/GER. Additionally, DKS will facilitate dialogue among local, regional, and national public authorities to develop concrete regional action plans and a transnational strategy for sustainable policy implementation of light reduction solutions across the North Sea Region.[3]

In Hamburg, two pilot areas were selected where new solutions are tested. The two pilot sites are located on the Elbe riverbank path, 2.5 km west of the Jacobstreppe to Blankenese ("Strandweg") and Am Sülldorfer Knick/Bullnwisch. In this article, we focus on the first pilot site. It is both a local recreational area and a central cycling route. Given the frequency of use, there is a strong human demand for lighting at night. Consequently, the proximity to the Elbe River ecosystem creates a conflicting situation.

The demonstrator sites in Hamburg employ a series of participatory workshops that engage regional holders, including biologists, scientists, lighting designers, as well as representatives from municipalities and authorities.

[2] Light pollution, defined as the excessive, misdirected, or inappropriate use of artificial light at night, is increasingly recognized as a cross-regional challenge and a serious environmental stressor that causes biodiversity loss and habitat fragmentation (e.g., https://darksky.org/resources/what-is-light-pollution/)
[3] https://www.interregnorthsea.eu/darker-sky

Fig. 1: Demonstrator site “Strandweg” human-centered perspective (Illustrated by A.C. Mosler)

Fig. 2: Demonstrator site “Strandweg” more-than-human perspective (Illustrated by A.C. Mosler)

4 Methodology

Various methodologies exist in the field of more-than-human design. Ranging from attempting to provide humans with the experience of embodying another species[4], to giving the more-than-human world a “voice” within the design process through human representatives advocating for the right of nature. Other approaches include attempts to integrate the more-than-human world into a creative role in the design process, and the development of relationships between humans and more-than-humans. The scope of the objectives encompasses sensitizing and representing, the recognition of rights, integration, establishing novel connections, and the experience of relations (see Tab. 1).

Tab. 1: Non-exhaustive overview of more-than-human design methods

	Entity level	System level
Sensitizing	Role playing as other species (e.g., Live Action Role-Play (LARP)[5], Clarke et al., 2019; Light, 2024; Turtle et al., 2022; Biggs et al., 2024)	e.g., Rosen et al, 2024
Represent	Give voice by a spokesperson, human intermediaries e.g., Sánchez et al., 2023	e.g., Sánchez et al., 2023
Integrating	More-than-human world contributes to the design process (e.g., Westerlaken, 2024	e.g., Laurien et al. 2024, Rumo et al., 2024
Recognizing rights	e.g., Right of Nature (RoN) (e.g., Animals in the Room[6], Embassy of the North Sea[7], The Rights of Nature Tribunal[8], More than Human Life[9]	
	Legal Personhood to e.g., rivers[10],[11] and mountains[12]	
Relating	e.g., development of different ways of relating (Dolejsova, 2023)	e.g., Akama et al., 2020; Light et.al, 2024

The selected examples in Tab. 1 stand out for their variety of methodological orientations. The chosen categories encompassing “sensitizing”, “representing”, “integrating”, and “recognizing rights" focus on the level of needs, equal rights, and the awareness and empathic experience of humans. In contrast, the category of “relating” emphasizes interrelatedness and interdependence.

Our proposed approach attempts to depart from the entity/individual level and engage at the system level. By understanding humans as an integral part of a larger ecosystem, we seek to discover a relational approach beyond dualistic concepts, such as human/environment and nature/culture, through the workshop-series.

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[4] The feasibility of this remains a subject of debate (e.g., Nagel, 1974). However, it may contribute to the development of an experience and understanding of interconnectedness (e.g., Biggs et al., 2024).

[5] https://treaty.finsburypark.live/

[6] https://animalsintheroom.org/

[7] https://www.embassyofthenorthsea.com/

[8] https://www.rightsofnaturetribunal.org/

[9] https://mothrights.org/

[10] The Whanganui River in Aotearoa (New Zealand) was granted legal personhood in 2017.

[11] The Atrato River in Colombia was grated personhood 2019.

[12] Taranaki Maunga in Aotearoa (New Zealand) was granted legal personhood in 2025.

This approach focuses on the interconnectedness between humans and the more-than-human world by examining their relational dynamics. Drawing on theoretical concepts, such as *letting be* and *intra-action*, we consider the interconnections preceding the existence of entities.
To establish a foundation for examining the implications of this interrelatedness for the development of participatory more-than-human lighting design workshops, it is necessary to create a prerequisite situation through the following steps:

1. Foster awareness of the need to mitigate light pollution.
2. Promote mutual dialogue among human stakeholders.

The first two steps were established during the first and second workshops, which were conducted in May and September 2024 at the Research and Transfer Center Digital Reality Hamburg (FTZ DR). The first step was realized through a series of lectures on light pollution. The second step was achieved through a collective participation approach, in which the workshop was structured with an emphasis on joint action. Thereby "relational expertise" was established. Dindler and Iversen posit that participatory processes can foster relationships between participants as design outcomes (Dindler & Iversen, 2014). In practice, this approach focuses on the coupling between the environment and various participants in a dynamic and unreflected manner by examining how the participants could engage with the luminous environment utilizing the extended reality (XR) planning tool PARTICLE (Participation, AR (for VR and AR), Transparency, Interaction, Co-Design, Lighting Planning, "Erleuchtung" (Enlightenment)).

An additional objective of the first two workshops was to gather various perspectives for the development of the XR planning tool, PARTICLE. We conceptualized PARTICLE as an “unfinished-tool”, which undergoes continuous development by incorporating various viewpoints from each workshop.

The subsequent steps are as follows:

3. Foster an understanding of the relevance of moving away from anthropocentric, dualistic thinking towards an understanding of interconnectedness via the role-play model (see Fig. 2).
4. Building on the understanding of interrelatedness established in the preceding step, this step aims to explore methodologies for participatory lighting design workshops that encompass the more-than-human world.

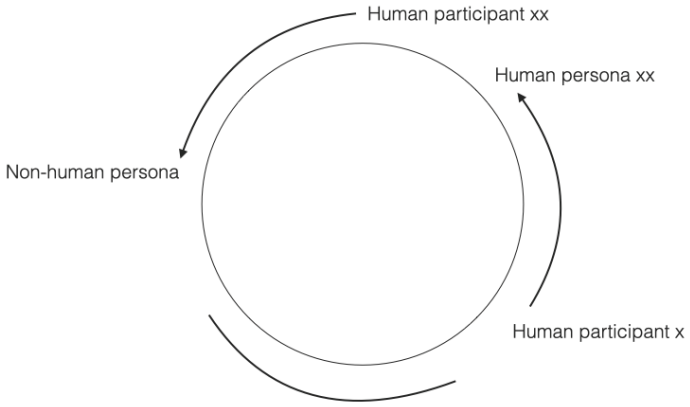

Fig. 3: Role-play model for workshop-series to achieve the third step

5 Discussion

The development of a methodology for participatory workshops addressing more-than-human lighting planning requires a relational perspective. This approach, which incorporates the concepts of *intra-action* and *letting be*, enhances the understanding of the interrelationship between humans and their more-than-human worlds.

Environmental conservation strategies often advocate for a stance to “leave nature alone”. However, this is challenged by biologist Robin Wall Kimmerer speaking from an indigenous perspective, “The participatory role of people in the well-being of the land has been lost, our reciprocal relations reduced to a KEEP OUT sign.” (Kimmerer, 2013, p. 327). However “But we were also given the responsibility to care for land. What people forget is that that means participating—that the natural world relies on us to do good things. You don’t show your love and care by putting what you love behind a fence. You have to be involved. You have to contribute to the well-being of the world” (Kimmerer 2013, p. 363). This perspective is reflected in the concept of *letting be*, understood in contrast to "letting go." It emphasizes *letting be* as a form of engagement rather than "a leaving alone", underscoring the reciprocal nature of interdependence.
Another approach to environmental conservation is establishing a “balance” between human and environmental needs. However, this approach often leads to a hierarchical “balance” in prioritizing human needs (see Fig. 3).

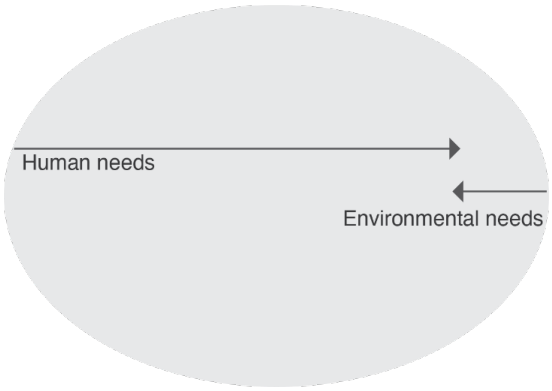

Fig. 4 : Balance model human versus environnemental needs

A paradigm shift in our perspective, understanding ourselves as intrinsically connected, will lead to other ways of designing. Kimmerer proposes repositioning humans from the Western perspective of a “user” to a position of care (Kimmerer 2013).
Nevertheless, the development of a methodology for participatory workshops based on an understanding of interconnectedness that truly dissolves dichotomies and hierarchies is strongly hindered by language and sociocultural practices. In this context, it is instructive to consider the language background; for instance, in Japanese, the concept of an individual (ningen 人間) inherently encompasses the environment. Japanese philosopher Watsuji Testuro posits that an individual can only be comprehended in relation to others and their environment (Watsuji, 1996 [1937]). In alignment with Barad's perspective, biologist Kriti Sharma posited that to attain a comprehensive understanding of interdependence, one must first transition from perceiving entities in isolation to recognizing their interactions and subsequently progress from acknowledging interactions to conceptualizing entities as "mutually constituted". In other words, entities exist only in relation to, and depend on, other entities (Escobar, 2018, p. 101).

6 Conclusion

This study investigated the potential implications of transitioning from the current predominantly human-centered approach to participatory lighting practice towards a more-than-human design approach for the pilot sites in Hamburg within the DKS project. The study posits that recognizing human-environment interdependency provides opportunities for implementing participatory lighting design approaches. To develop such an approach, participatory workshops are necessary to facilitate the transdisciplinary development of this methodology.

We conclude not by offering a definitive approach but by offering questions for further exploration:

- How can approaches to mitigating light pollution be reconceptualized by focusing on the interconnection between humans and the environment, rather than addressing human and environmental needs separately?
- How can perspectives beyond human experience be incorporated into the XR planning tool PARTICLE?
- How can lighting-related values, aesthetics, norms, behaviors, and policies be re-evaluated?

Acknowledgements

DARKER SKY is co-financed by the European Union under the Interreg North Sea program.

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