

DESIGNING ENGAGING INTERACTIVE ENVIRONMENTS: A PRAGMATIST PERSPECTIVE

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INTRODUCTION

Interaction design, my field of research, deals with the design of interactive systems as well as the ways in which these systems are experienced and used in practice.

Interaction design seems to be an **ever-evolving field**.

Some of the recent developments include

- 1) an increasing attention towards the effect that interactive systems have on **human interest and activity beyond the workplace**;
- 2) a shift from traditional desktop computers towards **interactive environments**, and
- 3) an increasing interest in **experience-oriented aspects** of computing in addition to functional aspects.

For the past three years, I've been conducting academic inquiries into interaction design with a particular interest in these developments.

I've been reading, doing field studies, sketching, carrying out design events, making mock-ups and prototypes, designing interactive installations, observing how they've worked in practice, discussing, travelling, reflecting, teaching, writing, and much more

In short, I've been doing **doctoral work**.

Today, I will give you an account of these three years in thirty minutes. This means that I have made some tough choices with regards to include and what to leave out. Fortunately, my dissertation is here for you to read if something catches your interest.

QUESTIONS AND CONTRIBUTIONS

During my PhD, I've been guided by a research question, that, although it has undergone transformations along the way, has served as the **frame for my inquiries**.

The question is this:

How can we conceptualize the design and use of engaging interactive environments.

In exploring this question, I have presented academic contributions on different levels and of different types:

List contributions:

Conceptual foundation: I have refined and explored **a particular way of seeing, understanding and working** with the problems and potentials in interaction design.

The **most comprehensive account** of my research is my dissertation which is the basis of today's talk.

The main part of the dissertation, 60%, consists of 7 academic publications. These publications are tied together by a summary of my work, including a presentation of my research approach, 5 of the experimental design projects I have been involved in, and an account of the pragmatist perspective on interaction design that has emerged during the latter part of my doctoral work.

RESEARCH APPROACH

My PhD project has in large part been financed by a project with a very long title, **Experience-oriented applications of digital technologies in knowledge mediation and marketing**. This project, which was anchored in **CAVI**, the center for advanced visualization and interaction, set the initial frame of my research. Since this project ended when I was halfway through my PhD, I've engaged myself in other projects, the most significant of these are **Media Facades** and **Digital Urban Living**.

My work in these projects have been carried out in association with **fellow researchers**; in all of the projects, a major component of our research has been the collaboration with **external stakeholders**. We have worked with these stakeholders and potential users to develop innovative interactive systems and installations for specific contexts ranging from business trade shows to public urban spaces.

In order to examine my research question within the frame of these projects, I've chosen and elaborated on a research approach which I label **research in and through design**.

In using this label, I build upon the work of Christopher **Frayling** and Martin **Ludvigsen** who distinguish between three basic types of design research

- 1) Research on design, in which the focus of research is on the product of design.
- 2) Research in design, in which the focus is on the design process.
- 3) Research through design, in which the researcher adopts perspectives and methods from design practice in research, possibly by engaging in design projects to pursue a research agenda.

I label my approach **research in and through design** because my research is directed at **improving the understanding and practice of interaction design**, using involvement in design experiments and projects as a **catalyst** for knowledge generation

I have chosen this approach for several reasons, most importantly because It gives **access** to design processes which it might otherwise be very difficult or impossible to access

It establishes a **closeness** to the field of study

It **combines experimentation with reflection** – both with regards to individual consideration and joint discussions among designers, stakeholders, and in the interaction design community

It **puts concepts and theories into play** in practice

PROJECTS

Today, as well as in my dissertation, I have chosen to present five of the projects I've been involved in. I have selected these projects because they represent the variety of the work I've carried out.

1. The Gum Façade

Business-to-business trade show

Provide product awareness and engage trade show visitors by use of interactive multi-user wall

2. Balders Funeral Pyre

Center for Children's Literature

Create engaging experiences for children by conveying the mood and narrative elements from Scandinavian mythology through the use of a corridor of flames

3. Silence and Whispers

Suomenlinna, a UNESCO world heritage site in Helsinki

Engage visitors in place-specific storytelling using audio fragments distributed in caves

4. Warsaw Museum of Modern Art

Proposal for architectural competition

Present visitor information and artwork visualizations by use of interactive displays that employ colour-changing concrete that is integrated into the museum building itself

5. Aarhus by Light

Concert hall and public park

Facilitate engaging, playful and social interaction around a media façade

Overview of projects

Interactive environments

Novel forms of interaction

Span a broad scope

- domains and situations – from candy conventions to museums of modern art

- users – from pre-school children to businesspeople

- scales – from interactive walls to entire building facades

- content - from product information to interactive games

- levels of completion – from design proposals to large-scale working installations

My involvement is motivated by gaining insights to inform my research agenda

PUBLICATIONS

As is the case with my projects, I have chosen to present a **selection** of my publications, seven in total. These publications represent the **scope of my work** in that they deal with **theoretical framings and considerations, techniques for design and reflection**, and **specific case studies**.

1. Inspiration Card Workshops

Presents a workshop technique in which cards that represent different sources of inspiration serve as tools to collaboratively develop design concepts.

2. Emergence of Ideas

Offers an in-depth analysis of how ideas emerge during an inspiration card workshop. The paper highlights the ways in which creativity is distributed across the participants and the inspiration cards, which in turn scaffold the exploration and transformation of emerging design ideas.

3. Maps for Design Reflection

Presents three types of maps for design reflection that capture key aspects of the design process and supports reflection upon them. The maps particularly focus on the ways in which design concepts are represented and transformed throughout the design process.

4. Designing for Inquisitive Use

Presents the notion of “inquisitive use” on the basis of pragmatism. Inquisitive use proposes a view on how to design for engaging interaction when challenging situations lead users to resourceful exploration.

5. Peepholes as means of engagement in interaction design

Further explores the concept of inquiry through the notion of “peepholes”, a design strategy for developing engaging interactive environments that on the one hand reveal glimpses of hidden phenomena to evoke users’ interest, on the other hand offer ways of exploring these hidden layers.

6. Staging urban interactions with media facades

Presents the development and study of Aarhus by Light and the ways in which the installation transformed the practices and experiences related to the concert hall and its surroundings.

7. Performing perception

Presents the development and study of Aarhus by Light and the ways in which the installation transformed the practices and experiences related to the concert hall and its surroundings.

Overview of publications

Represent the scope and core activities of my research

Address concerns relating to both use and design

- understanding the use context is essential for design

Some contain specific techniques for design

Some contain means for reflecting upon design and use

Some present design strategies and considerations

They draw upon different strands of theory

- pragmatism most prominent

A PRAGMATIST PERSPECTIVE ON INTERACTION DESIGN

Having gone through the included projects and publications quite rapidly, I will now dwell a bit more on the final part of the presentation.

The publications each deal with a specific theme or aspect of the design or use of interactive environments.

During the latter part of my doctoral work, I've moved towards a more **coherent conceptual scaffolding** that interaction design practitioners and researcher can make use of. In doing so, I've been particularly fascinated by the strand of philosophy known as pragmatism. My pragmatist perspective has thus emerged through **ongoing involvement in and reflection** upon the experimental design cases.

Pragmatism emerged in the US in the late nineteenth century.

One of the key tenets of pragmatism is the **primacy of practice principle**, which states that our knowledge and conceptualizations of the world should be evaluated on the basis of their practical consequences.

It has been described as a **philosophy of flux** in that it holds that phenomena in the world are **emergent** rather than stable and fixed.

Entities in the world **interact** and **transform** each other, and for this reason we have to keep our minds open and accept that ongoing **experimentation** is required for us to find out if our notions about the world hold true in practice.

There are numerous strands of pragmatism, including those presented by CS **Peirce**, William **James**, George Herbert **Mead**.

In my work, I've primarily built upon the work of John Dewey (1859-1952), an early proponent of pragmatism. Dewey was a massively productive writer as well as an **active and engaged citizen**. He was engaged in topics ranging from **democracy** and **education** to **psychology** and **art**.

My objective for examining Deweyan pragmatism has been to gain understandings into the design of interactive environments that foster engaging and meaningful experiences.

For this reason, I have **deliberately chosen to focus on a set of concepts** and their interrelations, namely situation, inquiry, transformation, technology, and experience.

Situation is the setting for human experience. Situation denotes the totality of person and surroundings, including other people, socio-cultural constructs, physical surroundings, and objects. Together, these elements constitute the frame and ground for human existence and experience.

Inquiry is the reciprocal process of reflection and action by which we seek a unified and meaningful resolution of situations that appear incoherent and challenge our habitual understandings and behaviour.

Transformation denotes the shifts and changes that occur within and across the components of a situation over the course of time as inquiry progresses.

Technology, is an integral part of inquiry. Technology can be understood as the instruments that are drawn into inquiry to scaffold it, acting in this respect both as constitutive of experience and as means of altering it.

Experience can be understood as a two-fold concept. On the one hand it denotes the ongoing flow of encounters that we take in, and upon which our horizon of meaning and habit is formed. On the other hand it denotes the distinct occurrences that stand out on the backdrop of the ordinary.

In practice, these concepts are interrelated and often inseparable.

INQUIRY

Out of the key concepts mentioned above, I have elaborated on the notion of inquiry in summary part of my dissertation. I have done so because I found this to be a way to identify and discuss some of the commonalities in my projects and publications.

I have chosen to examine inquiry in more detail because it “is the **creative and transformative** process we undertake in order to change an incoherent or **undesirable situation** into a **meaningful and unifying** one by employing our own repertoire of knowledge and competences as well as resources in the situation”

I consider this process to be of **central concern** in interaction design. On the one hand it can yield **insights into what occurs in the design process**, for instance when designers are engaged in creative and transformative processes; On the other hand, it can also help us understand **how people experience and use** interactive systems, for instance when users encounter and try to make sense of interactive environments such as Aarhus by Light.

In several of my papers, I have explored what makes for **engaging interaction**. I find that the pragmatist understanding of inquiry offers interesting perspectives on **central facets of engagement**.

With this motivation in mind, I have used the summary part of my dissertation to examine in more depth two aspects of inquiry, namely **technology** and

creativity. Technology and creativity are intertwined in inquiry, and they I have identified them in both design situations and use situations.

TECHNOLOGY

Inquiry often relies on technology.

- 1) Our maps for design reflection served to **frame our experience and understanding** of the design process in specific ways, highlighting particular facets of the process.
- 2) The flame corridor in Balder's Funeral Pyre established a **solemn atmosphere** that framed the experience of key parts of the Scandinavian mythology exhibition.
- 3) With regards to the transformative aspects of technology, the cards that are developed and brought into play in inspiration card workshops were **transformative** in that they helped **create and refine design concepts**, and in the process the **cards themselves were transformed** and embedded with new understandings;
- 4) Turning to use situations, Aarhus by Light clearly had a **transformative effect on the concert hall park**, which on many occasions was transformed from a transit space into a public space for playful socialization.

CREATIVITY

Inquiry can also be described as creative.

- 1) Our development of the concept for the Warsaw MoMA was characterized by an extensive **ongoing creative dialogue** between us as designers, the overall building concept, and the strange interactive concrete that we were exploring.
- 2) The Silence and Whispers prototype played on **imaginative creative dialogue** between past experience, present situation, and potential futures.
- 3) With regards to the distributed traits of creativity, our studies of inspiration card workshops highlight the **interconnected nature of design ideation** in which both workshop participants and design props such as inspiration cards play important roles.
- 4) The Hydrosopes described in the Peepholes paper illustrate **collaborative exploration and creation** of marine exhibition themes supported by interactive systems designed to foster creation and engagement.

AARHUS BY LIGHT EXAMPLE

The pragmatist perspective may still be a bit abstract to you, especially since I've gone into a detailed account of inquiry. I'll zoom out a bit and explain in other words how this pragmatist perspective works for me in practice.

Consider the example of Aarhus by light. My pragmatist perspective implies that when I look at this environment and consider **if, how, and why** it is engaging, I look at:

How the elements of the situation come together – the users, the passers-by, the architecture of the building, the public park, and the technological gizmos.

I look at **how people's curiosity is aroused**, and how they **inquisitively** explore and use the installation.

I look at how Aarhus by Light **transforms the building, the park, and the ways in which people think and act in it.**

I look at how the different **technologies** in the place and installation **frame how people experience the situation**, and how the installation offers **people ways of engaging in the situation.**

WHY PRAGMATISM?

Having outlined key aspects of pragmatism, I will round off my discussion of pragmatism by discussing **why and how a pragmatist perspective may be of value** in interaction design.

First of all, pragmatism articulates and explores a **coherent and intertwined set of concepts** that are central to my own research agenda.

These concepts help in **exploring, describing, and understanding** the challenges that are packed together in my research questions: "How can we conceptualize the design and use of engaging interactive environments."

However, I also find this perspective to be of interest to the **wider community** of interaction design.

Pragmatism has a strong affinity with what we may call **designerly thinking**, the ways of approaching problems that characterize designers:

Intervention and transformation: Interaction design is an **interventionist discipline**. It seeks to bring about changes by developing and staging products and environments that alter how we perceive and act in changing situations. The interventionist and transformative agenda of interaction design seems **well-aligned** with the tenet of pragmatism that practice-based action takes precedence over doctrines.

Deweyan pragmatism regards ideas and theories as **tools for action**; it is by putting them to work in practice that we can know their value and meaning.

Experimentation, in a pragmatist understanding, affects not only things outside of person, it **changes the whole situation** including the person. As a consequence, the experimenting designer may gain **richer understandings** of the situation and rethink it. This mirrors the oft-used description of design as an **iterative process** in which designers move towards a better understanding of the problem through loops of interventions and experiments (e.g. Löwgren & Stolterman 2004).

Tradition and transcendence: A crucial dilemma in interaction design is the dialectics between **tradition and transcendence** (Ehn 1988). This tension between the existing and the potential is also central to the pragmatist understanding of creative action, in the sense that the person's **habits, repertoires and predispositions** are persistently exposed to the **fluctuating conditions** of the environment. This prompts reflection and action that may establish a **new, provisional equilibrium**.

I argue that pragmatism can serve as a **conceptual frame for inquiries into both design and use situations**, as I have shown with regards to aspects of inquiry.

Pragmatism is also **well-aligned with my research approach**, research in and through design, and can help understand how to carry out design research and what to make of the results of this research.

Finally, there are a number of **existing contributions** that build upon Deweyan pragmatism that one can draw upon in establishing a **coherent conceptual scaffolding**. These include **Donald Schön's** work on design as a reflective practice, **John McCarthy & Peter Wright's** work on Technology as Experience, **Larry Hickman's** examinations of Dewey's philosophy of technology, **Richard Shusterman's** somaesthetics, and local contributions such as **Marianne Graves Petersen** and her colleagues' articulation aesthetic interaction.

SUMMARY AND FURTHER PERSPECTIVES

My doctoral work has been guided and framed by an **overarching question**: How can we conceptualize the design and use of engaging interactive environments.

In today's presentation, I have shown how I have explored this question in my dissertation, which is composed of seven publications framed by a summary that includes my research approach, the projects I have been involved in, and further elaboration of the pragmatist perspective.

As a summary, let me **restate the contributions** that I have made in my dissertation:

1) On the highest level of abstraction, I consider my development and explication of a pragmatist perspective on interaction design to be the most cohesive contribution of this dissertation. In addition to exploring how this perspective can scaffold understandings of distributed and dialogical creativity as well as experiential and transformative technology in inquiry, my research approach is also based on pragmatist principles.

2) On a more concrete level, the included papers present various means for design and design reflection. These range from specific workshop techniques to employ in the design process through ways of capturing aspects of the process for reflection to design considerations and sensibilities stemming from analysis of use situations. A common denominator among these means is that they are not prefabricated solutions for specific design problems, but rather instruments that can be part of the repertoire underpinning reflective design practice and research.

3) On the most concrete level of contributions, I count the prototypes and installations developed as part of my research in partnership with collaborators from my research community and external institutions. These artefacts embody specific themes, questions, and hypotheses, and in a pragmatist perspective, they can be construed as manifestations of conceptualizations that are put to the test in practice.

FURTHER PERSPECTIVES AND FUTURE WORK

At this point, I might normally say that my work here is done. However, there are a number of issues that I would like to examine in the future. Some of them may be issues that I have the chance to discuss with the committee members.

Further examinations of pragmatism in interaction design

- experiential qualities in design and use
- dialogue with other conceptual framings

Design documentation and reflection

Creativity and innovation in design

Closed installations vs. open-ended interactive environments

THANKS

Collaborators and co-authors

External users and project stakeholders

Colleagues here and abroad who have contributed with valuable insights and critique

Three members of my committee for their time and effort – hopefully I'll also be thankful two or three hours from now

Finally thanks to all of you for showing up and staying awake.