

## CASE STUDIES IN THE USE OF DESIGN PRACTICE BY PHD RESEARCHERS



## DEVELOPING DIGITAL DESIGN TECHNIQUES: INVESTIGATIONS ON CREATIVE DESIGN COMPUTING

**CREATIVE DISCIPLINE:** Interior architecture

**RESEARCH METHODS:**

Research by design

**NUMBER OF DESIGN CASE STUDIES UNDERTAKEN BY THE RESEARCHER:** 8

**LENGTH OF THESIS:** 99000 words

**EXAMINATION FORMAT:** Thesis and oral defence

**DURATION OF STUDY:** 10 years part-time

**EXPERIENCE OF DESIGN PRACTICE BEFORE START OF PHD:**

- Diploma as Interior Architect and furniture designer from NCAD Oslo (today KHiO)
- Furniture designer (2 years)
- Interior architect (4 years)
- Architectural office (2 year)
- Industrial designer (13 years)
- Installation artist (14 Years)

**PERSONAL MOTIVATION FOR UNDERTAKING PRACTICE DURING PHD:**

- To accumulate a more substantial knowledge in the field
- General curiosity and love for knowledge
- Interest in the philosophy of science
- Desire to more fully understand and situate own professional practice

**AIM OF THE RESEARCH:**

To describe, systematise, develop concept methods and approaches in experimental creative design computing.

**RESEARCH QUESTIONS:**

- What questions would emerge from looking into one's own digital generative practice in a deeper and more structured way?
- How to develop understanding and interpretation of one's own digital design practice?
- How to conduct research by design?
- How to generalise local and personal knowledge based on unique design experiments?

**OBJECTIVES:**

- Balance the depth of sub-investigations of the theme
- Develop critical reflection on own work as a means to validate the research by design
- Crystallisation of a research by design approach



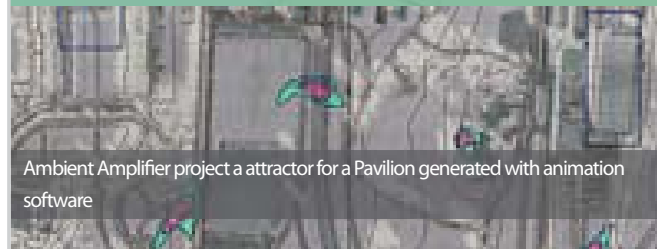
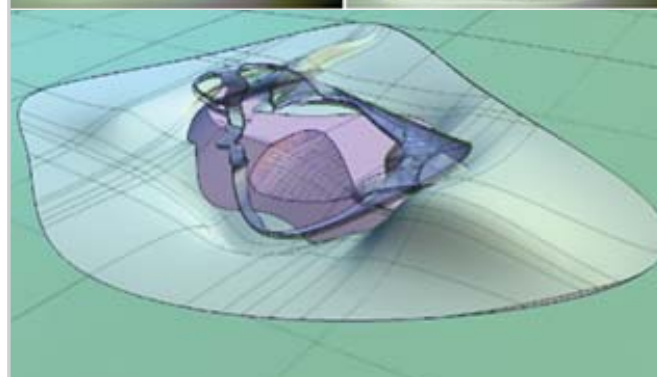
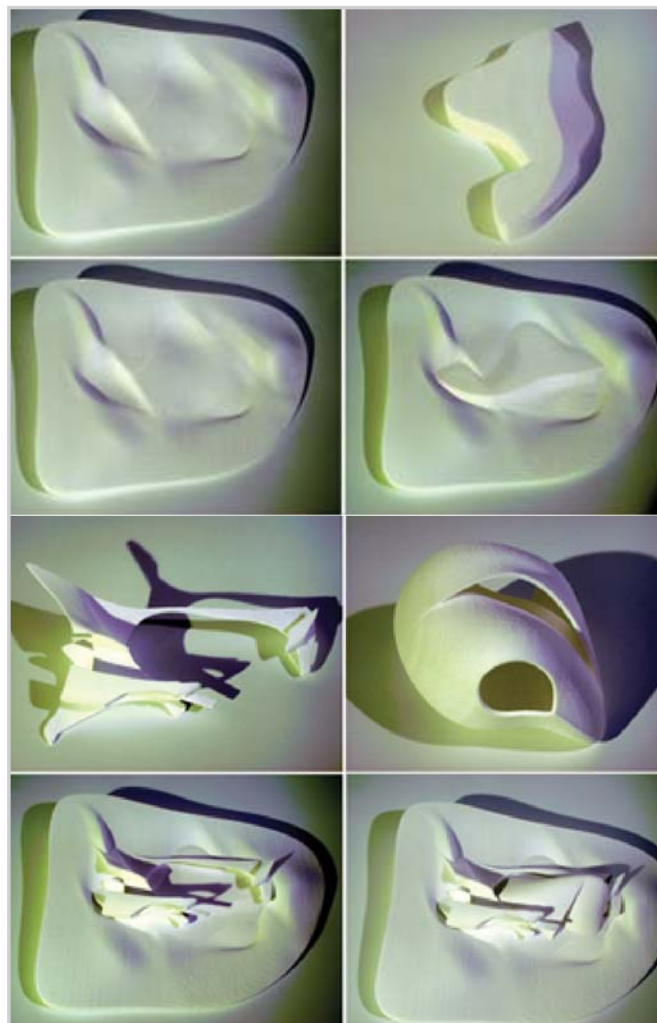
**RESEARCHER:** Dr Birger Sevaldson

**INSTITUTION:** Oslo School of Architecture and Design

**DATE OF AWARD:** 2005

**SUPERVISOR(S):** Dr Judith Gregory, Christena Nippert-Eng, Andrew Morrison, Michael Hensel

**EXAMINER(S):** Malcolm McCulloch, Thomas Binder, Liv Merete Nielsen



Ambient Amplifier project a attractor for a Pavilion generated with animation software

**SUMMARY:**

The thesis is a generative and explorative investigation using experimental digital design as a tool for doing a methodological investigation into design. It is practice based and based on research by design. It uses the researchers own design experiments as empirical data. Several concepts for design emerged from these experiments and were reflected on in the thesis. The thesis focused on the early stages of the design process; the explorative phases before the constraints of realisation started to narrow down options. It presents several approaches, spanning from simple techniques such as "direct modelling" to complex design processes where the computer's potential as a creative design tool is exploited. The latter approach implied reaching beyond direct representation of the artefact and operated in stages of abstraction. This could imply an intuitive and tentative-heuristic process where the translation, transformation and interpretation of visual material was central. On the other hand, a process reaching beyond figurative representation of the artefact could implement a meticulous diagrammatic rendering of forces, agents and features that were not directly perceivable but nonetheless crucial for the design process, especially when dealing with complex contexts. These mappings of dynamic relations were treated as arenas for creative design innovation.

The perspective of the design process was where the designer remained the driving force, despite extensive use of emergent design techniques based on digital technology. This was based on two main driving forces:

- Human creativity of all kinds and in all variations - individual, social, cultural (participatory, adaptive, evolutionary)
- The design media - the design concepts, tools and technologies that were available (from pencil to computational photorealism, complex simulations and emergence)

From the particular perspective of the design process, generative techniques produced an unanticipated output that would stimulate the design process. This process would still be monitored and controlled by the designer. The thesis develops, explores, maps and describes some of these possible approaches.

The thesis propagates a view of the design process as non-conclusive, open-ended and continuously under construction. Digital technology does not replace any existing design methodology, strategy, medium or technique. The new ideas stemming from the introduction of digital technology inspire the development of richer and more varied approaches where the traditional ways of working are part of a whole. A key outcome from the thesis was the clarification of the Hybrid Process as offered as the primary conclusion of the thesis.

**RATIONALE FOR THE INCLUSION OF DESIGN PRACTICE UNDERTAKEN BY THE RESEARCHER:**

The experimental digital design practice was the driver in this research. The practice was not only central but the main knowledge generating mode. The practice developed continuously during the first three quarters of writing the thesis. The writing process and making processes were closely interlinked and fed into each other. There was an ostensive relation between the text and the designed material.

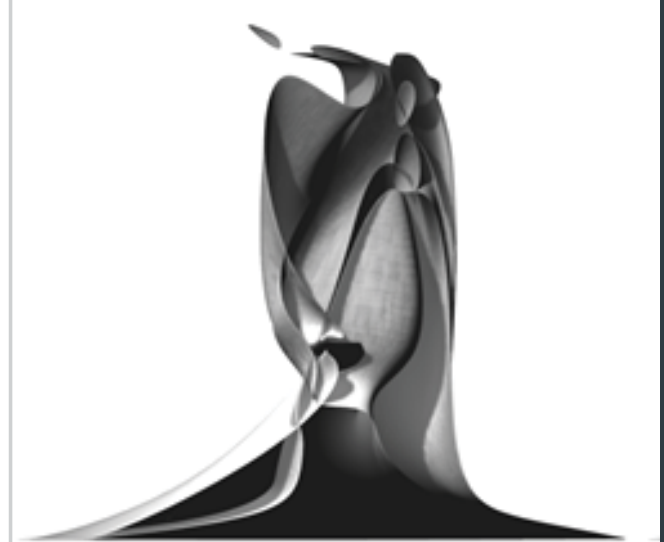
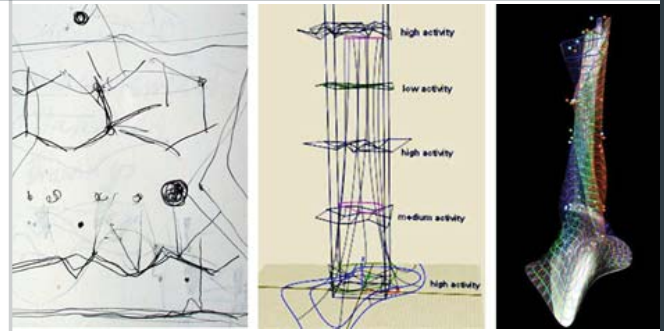
**HOW THE PHD DESIGN PRACTICE DIFFERED FROM THAT OF COMMERCIAL PRACTICE:**

The design practice was highly experimental and has to be compared with basic research, developing new design techniques for the design practice to be further developed and only eventually at later stages to be implemented in a commercial context. At this point there was no way of seeing this in relation to any commercial application. Later, after the finalization of the thesis the work developed further into systems oriented design which has a very close link to commercialisation.

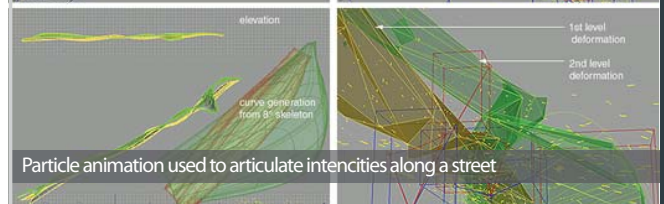
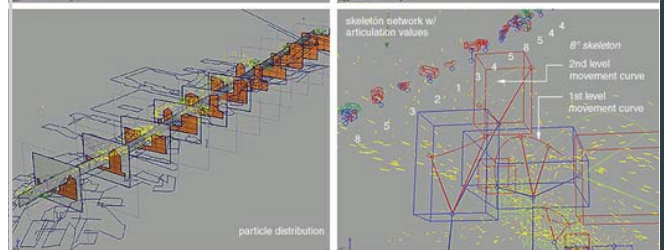
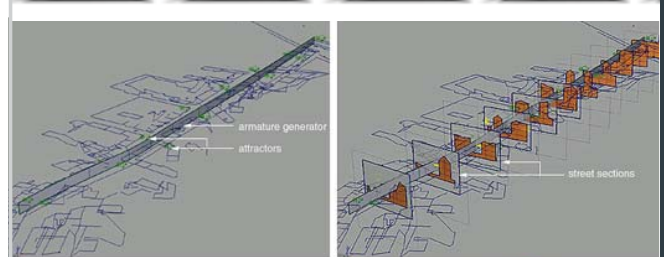
**THESIS AVAILABLE AT:**

[http://www.birger-sevaldson.no/phd/Developing\\_digital\\_design\\_webversion.pdf](http://www.birger-sevaldson.no/phd/Developing_digital_design_webversion.pdf)

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Design for World Centre for Human Concerns building generated using software with semi-control of the deformation of surfaces



Particle animation used to articulate intensities along a street

Design Practice Research Case Studies have been compiled by the Design Practice Research Group at Loughborough Design School. If you would like to work with us or contribute a case study, please contact the Design Practice Research Group Leader, Dr Mark Evans (M.A.Evans@lboro.ac.uk).

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
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