

# Being there, doing it: The challenge of embodied cognition for design

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## ABSTRACT

This workshop investigates how to apply *embodied situated cognition* to the design for interaction. Participants combine embodied experiences, prototyping and theory. We aim for deep-level linkage of theory and practice by uncovering some of the more complex challenges that embodiment presents in the context of concrete design cases.

## Keywords

### ACM Classification Keywords

H.1.2. Models and Principles: User/Machine Systems  
H.5.2. User Interfaces: Theory and methods, Prototyping

### General Terms:

Design, Human Factors, Theory

### Authors' Keywords:

Embodied Cognition, Interaction, Cardboard Modeling.

## INTRODUCTION

In the past 20 years, the cognitive sciences have seen a dramatic shift from explaining cognition in terms of *knowledge*, internally represented and transformed by internal computations, towards understanding cognition as a local, situated and embodied achievement *in action*. 'Embodied and Situated Cognition' (ESC) explains how internal activity and external elements and activities all work in concert to create cognition, allowing for creative, improvisational ways of sense-making. [1,2,5,4,13]

ESC has become popular in cognitive science [3,15], but is not applied in a straightforward manner. Meanwhile, practitioners feel the need for 'embodied' and 'situated' designs [6, 7,11]. Don Norman's 'knowledge in the world' signaled a trend [12], and recent work discussed ESC more explicitly in relation to design [14, 17], culminating in Paul Dourish's seminal work 'Where the Action Is' [8]. Although Dourish's book has been influential, various underlying theories have not become accessible for most designers. Many writings are dense, and the theory's complexities are not easy to apply straightforwardly.

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For example, there is discussion on whether designed artifacts can actually have 'affordances' [9] or whether this term is to be reserved for natural settings. Or consider the idea that human beings develop local, *situated couplings* with artifacts. The question rises what defines the product: it's design, or it's use? [16]? It is not always clear how designers should deal with such issues in concrete projects.

We've seen many 'embodied interaction' concepts passing the scene, but at present a lively conceptual discussion in relation to theory seems to be lacking. Meanwhile, 'embodiment' has become a popular term, e.g. see [10]. This is understandable, with the many new technologies that allow for physical interaction, and the ever increasing role of digital computing in our daily lives. Yet we fear that, beyond catch-phrases, the theory and its consequences for design are often still not properly understood.

## OBJECTIVES, APPROACH AND PARTICIPANTS

This workshop offers designers a deeper understanding of the way human beings, designed artifacts and the surrounding environment engage in situated and embodied couplings – and invites discussion of the role of artifacts within those couplings. As designer-researchers, we approach this discussion in a creative, 'designerly' way by combining embodied experiences, hands-on prototyping techniques and theoretical reflections [11]. Concrete design proposals will be designed, presented in the form of lo-fi prototypes and discussed within the theoretical context. The workshop aims to contribute to the further development and firm linkage of embodied theory and design practice.



Figure 1: Prototyping as a reflective design activity

We invite designers, researchers and artists, in particular those working with space, movement, tangible media, augmented reality, or related to participate.

### WORKSHOP PROGRAM

The full-day program consists of the following activities:

1. Introduction to Embodied Situated Cognition
2. Experience-objects, activity & reflection
3. Introduction in cardboard modeling (figure 1).
4. Creating & presenting the concept in the form of a lo-fi prototype
5. Reflection, link to theory
6. Group learnings: defining the main challenges for applying ESC to design.

**Theoretical introduction:** We will discuss some differences between the various flavors headed under the umbrella of embodiment: embodiment in phenomenology, embodied cognition, situated cognition, distributed cognition, and activity theory. Attention is drawn to the difference between ‘metaphor-based’ embodied accounts, as applied in many ‘Tangible Media’ systems, where physical objects are designed to represent digital objects, and more ‘radical embodied’ accounts, where the goal is to design for interactions whose meaning exists ‘in action’, integrated deeply within people’s actual embodied, situated practices.

**Experience objects & reflection:** We reflect on first-hand experiences of concrete objects and artifacts.

**Design Case & Presentation:** We apply learnings to a concrete design case of an interactive system supporting an everyday human activity. Teams evolve concepts through explorations in cardboard modeling and present their prototypes.

**Reflection, link to theory:** After each hands-on assignment we link back to theory and try to integrate our personal experiences with some of the theoretical concepts. Working with- and reflecting on the design assignment we aim to uncover on some of the more challenging (perhaps even problematic) aspects of how to apply ESC in design. Post-conference discussions may be found at [www.jellevandijk.org/cc1embodied](http://www.jellevandijk.org/cc1embodied).

### ABOUT THE ORGANIZERS

**Jelle van Dijk** is currently working on a Phd investigating the application of embodied cognition theory to the design of interactive media systems.

**Joep Frens**, did a Phd on *rich interaction*, is assistant professor in Industrial Design, and a skilled craftsman in designing and prototyping for embodied interactions.

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