

Embodied Ideation, Toolkits, and Sketching

José Manuel Vega-Cebrián*
Department of Computer Science and
Engineering
Universidad Carlos III de Madrid
Madrid, Spain
jovegac@inf.uc3m.es

Andreas Lindegren*
EECS
KTH Royal Institute of Technology
Stockholm, Sweden
alindeg@kth.se

Mafalda Gamboa
Interaction Design, CSE
Chalmers University of Technology,
University of Gothenburg
Gothenburg, Sweden
mafalda.gamboa@chalmers.se

Ana Tajadura-Jiménez
Department of Computer Science and
Engineering
Universidad Carlos III de Madrid
Leganés, Madrid, Spain
UCL Interaction Centre
University College London
London, United Kingdom
atajadur@inf.uc3m.es

Ylva Fernaeus
EECS
KTH Royal Institute of Technology
Stockholm, Sweden
Umeå Institute of Design
Umeå, Sweden
fernaeus@kth.se

Elena Márquez Segura
Department of Computer Science and
Engineering
Universidad Carlos III de Madrid
Madrid, Spain
elena.marquez@uc3m.es



Figure 1: Embodied Ideation, Toolkits, and Sketches

*Both authors contributed equally to this work.

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Abstract

Movement-based design foregrounds the moving and sentient body, fostering holistic engagement with the surrounding physical, material, and sociospatial contexts. Over the years, this approach has yielded multiple methodologies, tools, and exemplars to support body-based ideation. In this studio, we explore tools that facilitate embodied thinking and the creative processes of designing with, through, and for the body. In particular, we focus on: i) embodied ideation tools, kits, and technology probes to prompt ideation; ii) sketching and other documentation techniques to materialize ephemeral embodied action during ideation. We will bring tools

and techniques to engage with both aspects, and we will invite participants to bring their own, which can be physical or technological, low or high-fidelity. This hands-on studio will provide a space to collectively engage in embodied ideation and sketching; exploring, analysing, and engaging deeply with the available objects and methods. The studio will culminate in a rich set of visual material and an annotated portfolio, which will be shared with the broader community, fostering connections among designers interested in movement-based and tangible design.

CCS Concepts

• **Human-centered computing** → **Systems and tools for interaction design; Interaction design theory, concepts and paradigms; User interface toolkits; Participatory design.**

Keywords

Movement-based Design, Body-based Design, Soma Design, Toolkit, Technology Probes, Embodied Sketching, Body Perception, Body Movement, Multisensory Feedback, Biofeedback, Ideation, Bodystorming, Bodystorming Basket, Ideation Props, Ideation Probes, Sketching

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1 Introduction

This studio follows a long-standing theme at TEI in which a core focus is on *embodied interaction*, referring to engagement with technology through physical movements and senses, such as gestures, manipulating tangible objects, moving through space, and by social engagement with others. Almost ten years ago, a couple of workshops in CHI [15, 16] gathered practitioners of movement-based and soma-based design who shared, put in conversation, and identified the theory, methodologies, techniques, ideation toolkits, and design exemplars they had developed and employed. These design practices have in common an interest in deeply engaging with the living body in a holistic way, designing *experiences* or *activities* and not only *devices* or *technologies*. Since then, there has been significant work advancing these dimensions. In this studio, we want to focus on two things we find can benefit this area of research. First, there is nowadays a considerable array of tools and techniques that allow people to design with and for the body, but as the commonalities and differences between them might not be clear both for experienced and novice designers, it can also be disorienting. Secondly, it is not always given how the *experience* and *use* of these physical tools for design work can be documented for the design process.

During the past years, several toolkits have emerged for different application domains and based on different theoretical backgrounds. For instance, there are the Soma bits [45, 46] based on Soma design [13], the Embodied Ideation Toolkit [10, 31] aimed to designing and discussing futures, the Movits [44] with a focus on movement

learning, and more. These toolkits can be considered part of what has been called a *bodystorming basket* [43], a curated collection of objects with properties relevant to engage and explore with our bodies in particular application domains and stages in the design process. A prior curation process of this basket is an important aspect of facilitating an embodied design session and involves challenges not only regarding the adequacy of the objects for their affordances but also the planning of practical tasks such as bringing them to the session space or warming up to familiarize participants with them [43].

The practice of sketching is central to all fields of design [9, 19, 28] and especially within the field of conceiving, visualising and ideating on interactive systems this is a long-standing theme [1, 34]. The field of TEI, with its attention to felt experiences and complex physical assemblages of physical objects, brings about specific challenges when it comes to sketching. First, illustrating activities taking form in physical space, different from typical design efforts focusing on e.g. graphical or screen-based interfaces. Second, illustrating felt, invisible experiences, such as the effort or physical tensions involved. Third, illustrating actions and activities over time, where for instance comic books, storyboards and hands-on role playing along with semiotic annotations such as arrows, call outs, and highlights are used. We want to tackle these challenges in the context of embodied interaction toolkits, exploring how sketching can be done and documented.

For this studio in TEI, we are interested in revisiting the advancements in the field of movement-based and soma design with a focus on the physical tools, probes and toolkits that are currently used to design with and for the body. We intend to gather and cultivate community, to provide a space for a deep demonstration and exploration of these toolkits, and to work on an annotated portfolio of their characteristics. The studio is directed both to current practitioners of embodied design, soma design, movement-based design and to researchers interested in learning and engaging with these methodologies.

2 Studio Description

The studio will consist of four main parts which will require hands-on engagement: (1) a demonstration of participants' toolkits and bodystorming baskets, (2) an exploration of embodied ideation for a provided case study, (3) exploration of sketching methods in documenting the ideas from the previous session, and lastly (4) the creation of an annotated portfolio and roadmap discussion. See Table 1 for an overview of the schedule.

To support these activities, in the call for participants, we will request some information regarding the researcher application domain, their level of experience with embodied design methods, and if they have ideation probes, technology probes or toolkits that they would like to bring to share and try with others, as well as current challenges or explorations they have encountered in their design processes. We will start the studio with an introductory talk of basic concepts of movement-based and soma design, to establish a common ground and to provide an anchor to those who might not be familiar but are interested in engaging with these approaches.

In the first part, we will invite participants to provide a short demonstration of their toolkits with the rest of the group. In line

Time	Activity
09:00 - 9:30	Introduction
09:30 - 10:30	Toolkits demo
10:30 - 10:45	<i>Break</i>
10:45 - 12:00	Movement-based ideation
12:00 - 13:00	<i>Lunch</i>
13:00 - 13:15	<i>Regroup</i>
13:15 - 14:00	Intro to Sketching Method
14:00 - 15:15	Sketching activity
15:15 - 15:30	<i>Coffee Break</i>
15:30 - 16:30	Annotated Portfolio
16:30 - 17:00	Roadmap Discussion
17:00 - 17:30	Exhibition

Table 1: Schedule Overview

with common strategies in embodied design, we will facilitate a space for an embodied exploration of these toolkits, attempting to follow the “show, don’t tell” maxim to the extent that it would be possible.

For the second part, we will divide the group in teams based on commonalities such as interests, materials, application domains or theoretical frameworks, so that they work together for an embodied ideation session based on bodystorming [25]. Each team will have a bodystorming basket, including at least one ideation toolkit, and crafting objects. Based on the participants’ input collected from their applications, each team will have a personalised case study that will serve as the basis for the bodystorming. For example, one team could engage in exploring wearables to support experiences of occupational therapy, and another could explore the changes in body perception induced by multisensory feedback. The objective will be to ideate and prototype some possibilities in response to the case study. This will provide an opportunity to deepen the embodied exploration of the toolkits. In the end of the second part, each team will present and discuss their prototypes.

In the third part, the groups will be tasked with finalising and documenting their designs. With the possibility of including insights gained in the discussion from the previous part, each group will make sketches on the bodies, the context, and the use of the designs they made previously, with the goal of communicating the design, and possibly the process, to someone not physically in the room. This highlights the challenges of communicating the experience of embodied interactions in a research context.

In the fourth part of the studio, we will work as a whole group again, consolidating the insights discussed so far into an annotated portfolio of the toolkits in relation to their features, theoretical backgrounds, methods where they are employed, and design exemplars that they might have contributed to elucidate. We will finalise the studio with a general discussion and overview of possible next steps to take in regards to the community and the findings from the annotated portfolio.

In the case that no participant would be able to bring a toolkit, we would focus solely on the *Movits* [44], which are minimalist technology probes that encompass straightforward multisensory interactions based on lights, sounds and vibration responding to

movement. In any case, the toolkit or toolkits would be put in conversation and movement, tested and discussed generatively, providing a fertile ground for analysing their affordances, adaptability and extendability for different contexts.

3 Grounding

In 2016 and 2017, Höök et al. [15, 16] facilitated a couple of encounters between researchers, interaction designers, artists, and game designers engaging with movement-based interaction design, to come together as a community and start coalescing their theories and practical work. These workshops had a strong focus on *somaesthetics* [29, 30]. They resulted in works such as the one by Höök et al. [14], in which common characteristics of soma-based interaction design—such as an emphasis on first-person perspectives and felt experiences—were described and illustrated by design exemplars. We intend to revisit this type of encounter but within the context of tangibility and embodiment, specifically focusing on the physical objects in use during movement and soma-based design.

In movement-based design, physical objects have been described as a design resource with a similar importance of movement or space [43]. These objects can be completely analogue—such as crafting materials, toys, equipment related to the application domain—or contain digital interactivity features. They can also be part of an existing toolkit or be made during the design work. One famous example is the PalmPilot prototype [4], using simple materials like wooden blocks and cardboard as ‘sketches’. This kind of ad hoc collection of physical objects that is curated and brought to design sessions has been named *bodystorming basket* [43]. Choosing the contents of a bodystorming basket is an important facilitation task [43]. Within the physical objects presenting digital interactivity, one can find *technology probes*: they are simple and adaptable probes which have been designed to inspire users and researchers to ideate new technologies [11].

In the past decade, one can find several toolkits and ideation probes that have been crafted and explored to facilitate design sensitisation, exploration and ideation. For instance, the Inspirational bits [34], consisted of multiple units that exposed the workings of common technologies and input modalities. For the Embodied Ideation Toolkit [10, 31], Smit et al. [31] curated, designed and used multiple tangible objects to support embodied co-design processes

with the participation of diverse stakeholders. The Training Technology Probes (TTPs) [23, 24, 39] were a collection of minimalist wearable devices that sensed body parameters such as movement speed, body orientation or breathing, and provided multisensory feedback loops [23, 24, 39]. The Wearable Bits [18] were a modular set of patches with common electronic components to prototype e-textiles. The Soma Bits [45, 46] were presented as a kit of objects to explore haptic modalities at varied levels of intensity and in different parts of the body, with a strong focus on Soma Design [13, 17] processes. The TactorBots [48] consisted of a toolkit of multiple wearable units where each one provided a different type of touch gesture. The Menarche Bits [35, 36] were an open-ended prototyping toolkit to design wearable menstrual technologies for young adolescents, also with a focus on haptics. More recently, the DanceBits [5] consisted of a wearable prototyping kit for dance that was co-developed with a justice-oriented, computing and dance education organization [5]. Finally, the Movits [42, 44] were presented as a minimalist toolkit for embodied sketching design explorations with a focus on sensorimotor learning applications.

In combination with these tools, embodied sketching involves utilizing the designer's own body to simulate and examine the potential of design concepts before their actual development [26]. Such an approach foregrounds the importance of 'the body' in interaction design—a multifaceted concept that requires examining the human body not merely as a singular entity, but as a complex system comprising various conditions, movements, and relationships [13, 26]. Bodies are diverse and dynamic, affecting each individual's engagement with interactive technologies uniquely while at the same time shaped by collective cultural practices [3]. This is also seen in recent interaction design research, with sensations and sensibilities used as design material [7, 40], focus on the lived experience [38], the 'making' of dance [27], and even using the body as source for knowledge [2].

Beyond embodied sketching using role playing, material meditations, recordings and sharing of UX video snippets of imagined interaction scenarios, and other high-tech enabled methods, designers often resort to conventional static, two-dimensional visual forms, like moodboards [20], water colour painting [47], collage work [32], and finally *hand drawn sketching*, well documented throughout the TEI discourse through visuals presented in research papers, pictorials and presentations. For example, there have been used to represent conversations with one-self [6], collective making [41] and as a way of facilitating conversations [8]. This is not surprising considering the richness of the semiotics in visual media [21], although these approaches do not focus on supporting the facilitation and documentation of embodied interactions. Further, Laban analysis [33] and soma trajectories [37] are other approaches, with Laban analysis focusing on effort, shape and direction of moments, and soma trajectories concerned with how to depict embodied experiences diagrammatically over time. However, many recent visual methods that focus on bodies and their inherent experience do so with the risk of obscuring contexts and things [12], or uses simplification that renders bodies, objects, and contexts invisible altogether [37].

4 Learning Goals

We are interested in holding space for sharing and learning about the materials that different researchers curate for their application domains, and illustrating their use. More specifically, we want to provide an opportunity for researchers to share, put in conversation, extend and document those elements of their bodystorming baskets that they have designed and crafted themselves, such as ideation probes, technology probes, and toolkits constructed from those. In the studio, we will be able to build and test a collective bodystorming basket which could be employed in diverse application domains.

Additionally, the aim of the studio is to provide a hands-on exploration of methods employed in embodied design, such as those described under the umbrella term of *embodied sketching* [26]: sensitising and bodystorming, as well as how to visually represent them. We will choose from the participants' application domains and provide case studies where we all be able to engage with embodied sketching and our collective bodystorming basket.

5 Topics to be Explored

During the studio, we will engage with the following theoretical and practical elements:

- The community and relevance of embodied / soma / movement-based design.
- Concepts around movement-based design for holistic activities, such as *Embodied Core Mechanics* [22], *Embodied Sketching* [26] *Bodystorming* [26], *Bodystorming Basket* [43], and *Technology Probes* [11].
- Hands-on understanding of the Embodied Sketching techniques [26], with an emphasis in Sensitising and Bodystorming.
- The Movits [44], a toolkit for embodied sketching, as an exemplar of minimalist interactive probes to support ideation.
- The toolkits and probes that studio participants employ in their own design processes.
- The affordances of multisensory feedback and their relationship with body perception.
- How the above can be illustrated and communicated in static form in our research community.
- A collective annotated portfolio documenting the bodystorming baskets and ideation toolkits brought to the studio.

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