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& Felix Rasehorn

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## KOLLABORATIONEN & LABORATORIEN

Gestalterische Prozesse sind meist gemeinschaftliche Prozesse und so ist auch das gestalterische Forschen keine Einzeltätigkeit, was durch die Beiträge in diesem Heft deutlich wird. Wie sieht der interdisziplinäre Austausch in der Praxis aus und welche Rolle nehmen spezifisch Designer\*innen dabei ein? Mit welchen Methoden werden forschende Ansätze in der Lehre vermittelt und wie können digitale Technologien dabei unterstützen? Welche Räume, welche Infrastruktur benötigt es dafür, und wie kann auch die physische Interaktion selbst zum Gestaltungsgegenstand werden?

Die Design-Reseacher Robin Hoske und Felix Rasehorn erkunden in ihrem Text die Schnittstellen zwischen wissenschaftlichen Laboratorien und der Wissensproduktion, die in Gestaltungsprozessen stattfindet, um daraufhin ihre Vision eines Design-labs zu skizzieren. Anhand von eigenen Praxisbeispielen zeigen sie auf, inwiefern interdisziplinäre Designprozesse immer auch Lernprozesse sind und welche Rolle Designer\*innen dabei spielen.

„What if designers had more impact on the early development phases? What if design could start a discussion and technology would follow? What if design would be the framework for other disciplines to meet?“

Robin Hoske & Felix Rasehorn

„What is a Design Lab and Why do We Need More of Them?“ Seite 6–13

Die Gastprofessorin und  
Produktdesignerin Judith Glaser  
thematisiert in ihrem Beitrag die Fragen  
nach dem Zusammenhang von Design  
und *Research* in der Reflektion des von ihr  
initiierten und geleiteten Semesterprojektes  
*Hyper-Haptics*. Das Projekt sucht sowohl inhalt-  
lich als auch didaktisch nach Möglichkeiten,  
wie *Research* in der Lehre thematisiert, vermittelt  
und integriert werden kann.

„The idea was that students should have ‘no time’  
to elaborate their experiments and explorations  
on products and deal with product dimensions like  
production and distribution. They should be able  
to devote their attention solely to exploration and  
gaining knowledge.“

George Jaramillo, Sandra Stark  
und Daniel Kruse folgen mit einem  
Dialog zu den Chancen und Heraus-  
forderungen in der Gestaltung von trans-  
disziplinären Räumen mit dem Fokus auf  
kollaboratives, unternehmerisches Lernen.  
Das Gespräch entstand aus ihren bisherigen  
Kooperationen und erörtert die Notwendigkeit  
für instituts- und disziplinübergreifende Lehr-  
und Lernformate an den Schnittstellen zu Praxis  
und Wirtschaft und welche Rolle Selbstwirksam-  
keit dabei spielt.

Sandra Stark: „I would challenge the notion  
that these skills are established in mainstream  
design education and say that the learning  
spaces we have been working on carry as much  
innovative potential for design education as  
they do for business.“

Die Architektur- und Design-Forscherin Elaine Bonavia beschäftigt sich in ihrem Artikel mit einem Teil ihres Forschungsprojekts *Tracing Textility*. Sie erkundet das Zeichnen mit dem Körper im Raum, das durch digitale Technologien unterstützt wird. Das macht sie u. a. zusammen mit Studierenden in Seminaren und zeigt somit eine weitere mögliche Verflechtung von Forschung und Lehre auf.

„During the seminars, the question of how to relate to the sketch while drawing was something which came up in conversations of how to organize. [...] Students preferred to engage with space, time, movement and their imagination, allowing themselves to cultivate their own sense and sensibility through the journey of not knowing.“

Marleen Clara Bauer, aktuell Meisterschülerin im Textil- und Flächen-Design, setzt sich in ihrem Beitrag mit dem Wechselverhältnis von Körper und Raum auseinander und fragt, welche Rolle Objekte dabei spielen. Für *Symposion* entwickelte sie textile Wearables für Teilnehmende einer Wissenschaftsveranstaltung, die dazu einladen, die eigene Körperhaltung, den Raum und die Interaktion mit Anderen neu wahrzunehmen.

„Welches Wissen wird hier verhandelt, geteilt und ausgetauscht? Welche Gespräche werden geführt, welche Begegnungen finden statt, die üblicherweise von Stuhlreihen verhindert werden?“

WINT is a Berlin-based design lab dedicated to exploring ecological and technological responsibilities for shaping desirable futures. The Lab is currently run by Robin Hoske and Felix Rasehorn. Both studied together at weißensee school of art and design berlin. WINT has been supported by Design Farm Berlin, and received research funding by BMBF and Horizon 2020.

Robin Hoske is a design researcher in the field of Eco Design. His focus is on the development of sustainable, holistic design strategies. He is a research fellow at the environmental engineering department of Fraunhofer IZM, Berlin.

Felix Rasehorn explores bio-mimetic design approaches and collaborates with natural sciences. He is a research assistant at the multi-disciplinary Cluster of Excellence *Matters of Activity* and practice-based PhD Candidate at TU Berlin.

Working with ambitious concepts and small utopias, Hoske and Rasehorn created an infrastructure that is geared towards interdisciplinary exchange and collaboration with other knowledge domains such as Biology, Material Science, Software Development, and others. These collaborations enable them to consciously, technically, and economically co-develop projects that pave the way into preferable futures.

[www.wintdesignlab.de](http://www.wintdesignlab.de)

ROBIN HOSKE  
& FELIX RASEHORN

# What Is a Design Lab and Why Do We Need More of Them?

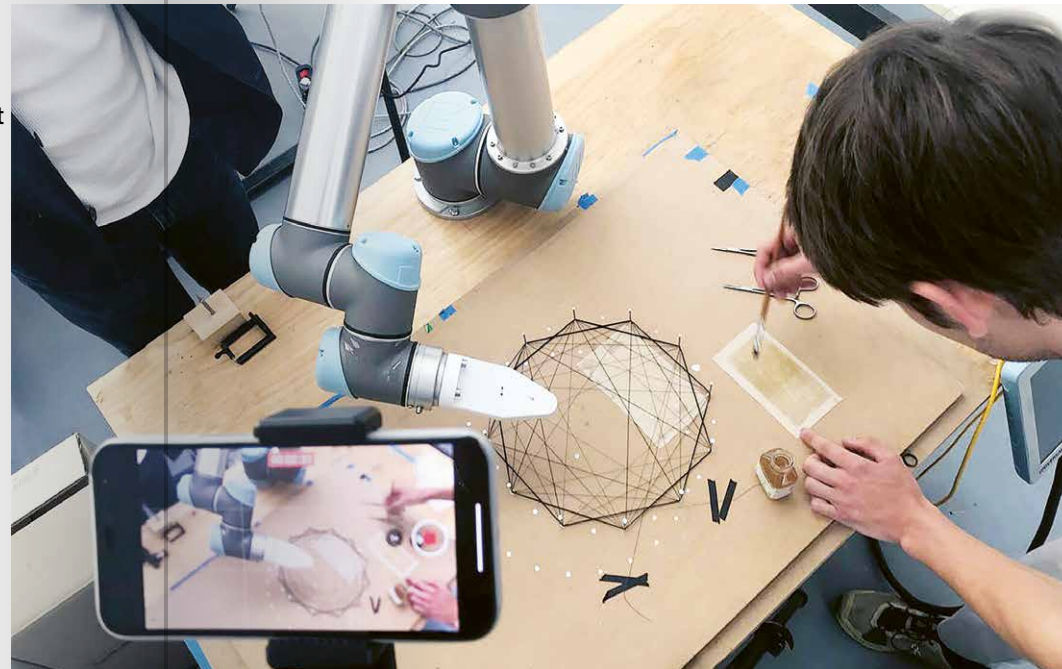
Hi there, we are WINT a Berlin-based Design Lab. This is how we usually introduce ourselves: aware of the fact that it is NOT clear what a Design Lab is, what it does, and what it is even good for. Actually, we are in the process of discovering this ourselves. What is the point of interweaving science and design, is there a clear dividing line at all? In fact, to claim what a Design Lab does is pretty much about agreeing on what Design does and what it is good for. This again is part of a discourse that has been going on for at least half a century. To discuss the purpose of Design Labs, we will look at the role of scientific laboratories and how knowledge is produced there and we will explore which forms of knowledge exist in Design in order to finally argue why we believe in a future of hybrid approaches.

## LABORATORIES AS INFRASTRUCTURE AND DESIGN AS A WAY OF KNOWING

Not everyone might have visited a science lab, but most of you will certainly have an understanding of what these places represent, what they are used for and why we need them. Scientific laboratories are a crucial part of the infrastructure of scientific practice, a knowledge culture whose phenomena of study is the natural world, that is concerned with objectivity, rationality and “truth,” and therefore established methods of analysis, classification and controlled experiments.<sup>1</sup> Science labs build the material bases to conduct experiments that will either confirm or invalidate a hypothesis. These hypotheses then can be induced (“principle of induction”) to build the foundation of our understanding of nature.

A scientist, whether theorist or experimenter, puts forward statements (...) and tests them step by step. (...) he (or she) constructs hypotheses (...) and tests them against experience by observation and experiment.<sup>2</sup>

Scientific experiments focus on rather specific problems that can only be performed by highly trained professionals:



Preparation for robotic experiment. © WINT Design Lab, 2021.

<sup>1</sup> Nigel Cross, *Designersly Ways of Knowing*. Design Studies, 1982, 221-227.

<sup>2</sup> Karl Popper, *The Logic of Scientific Discovery*, First English Edition, 1959.

3 B. Lawson, "Cognitive strategies in architectural design," in *Ergonomics* Vol. 22 No. 1, 1979, 59–68.

4 Cross (1982), 223.

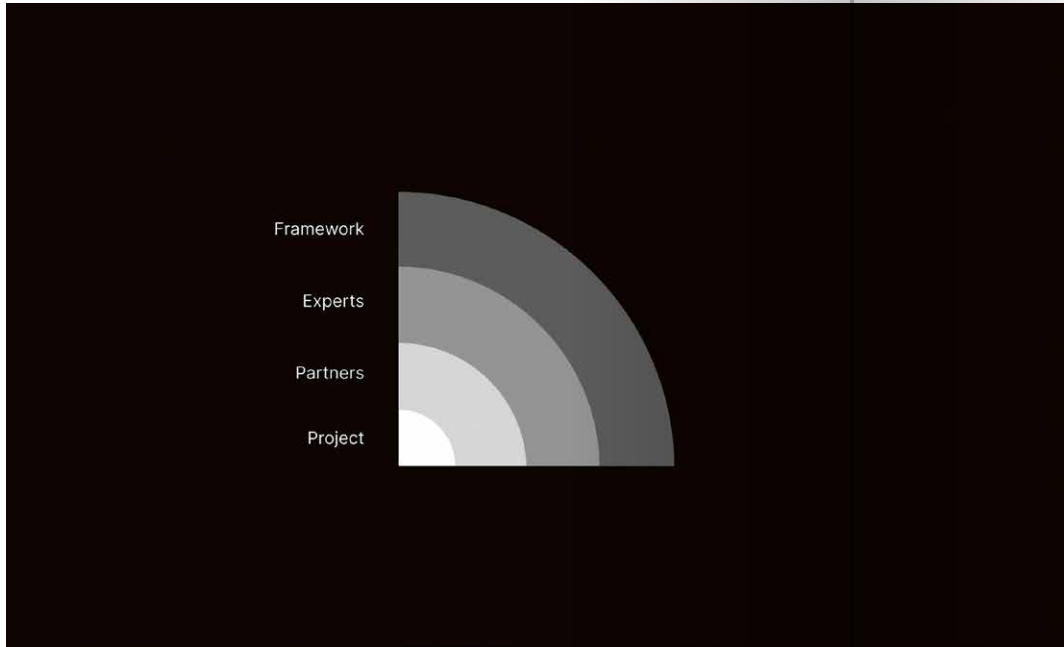
5 Cross (1982), 221.

scientists. Their results are then superimposed onto larger systems to identify a general "truth" that is valid until new hypotheses are verified. Methodologically, scientists rely on a clear dissection and understanding of a given problem's parameters, making the problem itself the matter of investigation. This approach can be described as generally problem-focused.

In the 1980s, studies were done to compare problem-solving strategies of designers and scientists to find out if there is such a thing as the "designerly ways of knowing."<sup>3</sup>

"The essential difference between these two strategies is that while the scientists focused their attention on discovering the rule, the architects (and designers) were obsessed with achieving the desired result. (...) In other words, they (designers) learn about the nature of the problem largely as a result of trying out solutions, whereas the scientists set out specifically to study the problem."<sup>4</sup>

Diagram of collaborative layers.  
© WINT Design Lab, 2022.



It became clear that design is not only an enabler but also an inherent and irreplaceable force in the formulation and conception of future scenarios. It is because one central concern of design is "the conception and realisation of new things."<sup>5</sup> Design visions ranging from

speculative to fictional to application driven help discuss, emotionally grasp, or evaluate the things that can, will, should, or shouldn't happen in the future. These formulated visions rely on the application of "the arts of planning, inventing, making and doing." Therefore, design evolved its own distinct "things to know, ways of knowing them, and ways of finding out about them."<sup>6</sup>

### BUT WHAT IS THIS GOOD FOR?

Over half a century ago, Horst Rittel and Melvin Webber introduced the term "wicked problems" in their article "Dilemmas in a General Theory of Planning." It is now recognized that wickedness (complexity and interconnectivity of problems) is an inherent part of human-human relations (social, economic, political, and cultural systems) that are seamlessly intertwined with human-nature relations (ecological, climate systems).

"Wicked problems are present in essentially all issue areas of socio-ecological practice that matter to the human society today, ranging from global climate change adaptation and mitigation, human sustainability, urbanization, to poverty, hunger, and the ongoing common threat posed by the COVID-19 pandemic."<sup>7</sup>

Once the wicked nature of problems had been recognized, it became evident that it challenged the status quo of problem-solving approaches, and thus paved the way to acknowledging the designerly way of knowing, as one possible and effective way of dealing with complex intertwined problems. It is the mode of working with problems, the ability to find out things along the way, to work with a not entirely defined system but an intrinsic practical, empathic and solution-focused drive. It has been found that this approach can partially be taught, not only in art and design schools, but also in workshops and business classes. "It's all over the business press, but how prevalent really is design thinking in today's organizations?"<sup>8</sup>

6 Cross (1982), 223.

7 Jeffrey Kok Hui Chan1 · Wei-Ning Xiang 2, "Fifty years after the wicked-problems conception: its practical and theoretical impacts on planning and design," published in *Socio-ecological practice research* vol. 4, 2022, 2.

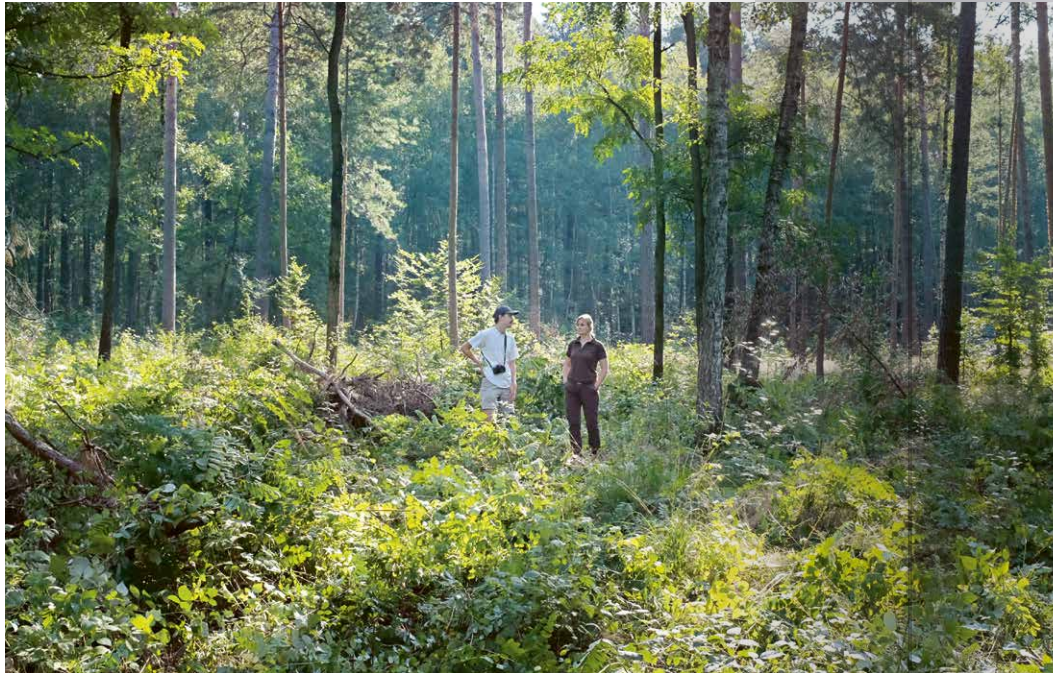
8 Sean D. Carr, Amy Halliday, Andrew C. King, Jeanne Liedtka, Thomas Lockwood, "The Influence of Design Thinking in Business: Some Preliminary Observations" published in *Design Management Review*, Vol. 21, 2010, 58-63.

It is widely accepted that IDEO is one of the companies that brought Design Thinking into the mainstream. Design Thinking became a buzz word in the early 2000, the promise was to teach the methodology and problem-solving approach of designers to professionals from other backgrounds, enabling them to tackle their challenges differently. So instead of acknowledging the role of designers within other disciplines, design became an asset that professionals could add to their portfolio of skills. Obviously, this can be empowering and helpful; at the same time we believe that extensive education and experience in the field of design cannot be compared with what can be taught in workshop. We believe that designers should themselves play a significant role in scoping, planning and decision making, instead of showing other disciplines how to think like them. To sum up, Design is a way of thinking and doing that is solution-oriented, it can enable other disciplines to perform better, help to imagine alternatives, enable discussion, foster decisions and ultimately aid in leading industry and society to change.

## TOWARDS MORE IMPACT THROUGH DESIGN

In Germany, design is mostly perceived as a service that comes at the end of a long technical development. Its role is then to make an innovation desirable and consumable. If designers deal with strategic or conceptual tasks, it is generally in the form of Design Thinking by offering a toolbox to decision makers. This is the understanding of Design that we want to shift. We see that the practice of Design is currently not recognized in its ability to interpret and structure information so that complex problems can be dealt with, nor to generate prototypes that build a basis for interdisciplinary exchange. This is the understanding of design that we want to establish, which is taught and practiced at weißensee school of art and design, as well as other academies. What if designers had more impact on the early development phases? What if design could start a discussion and technology would follow? What if design would be the framework for other disciplines to meet?

*BIONT* –  
MA Thesis  
Robin Hoske,  
Supervision  
Prof. Carola Zwick;  
Prof. Patricia  
Ribault. © Robin  
Hoske, weißensee  
school of art and  
design, 2020.



*GOLD* textiles –  
100% collagen  
0% plastic.  
© Denny  
Sachtleben,  
WINT Design  
Lab, 2022.

To illustrate how we combine design and science in practice, we will introduce our recent collaboration with the bio-tech startup Mimitype Technologies. Together with Mimitypes,

we developed an idea that evolved to become a 12-month research project funded by BMBF (Bundesministerium für Wirtschaft und Forschung). The project started with a scientific fascination for the Goldbeater skin, the outermost tissue layer of the cow appendix, a thin collagen membrane that is extremely elastic, tear-resistant, gas and water-proof. Can this biomaterial inspire us to shift our dependency on petroleum-based textiles?

Elastin fibers are usually blended with organic fibers like cotton, hindering their recyclability and circular product cycles to rise. We set out to develop a collagen-based material to meet the growing demand of Elastin and Spandex. Our goal is to synthetically replicate the properties of the goldbeater's skin to develop a biopolymer for high-performance textiles. The vision is that the substrate is cultivated in bioreactors and will therefore be 100% vegan and biodegradable.

As Design Lab, we explored the potential of the material's properties in the field of today's outdoor equipment and assessed possible impact pathways on bases of the Planetary Design Circle. For hands on experiments with the natural material, we searched forgotten archives and old scientific papers for descriptive process steps. Since collagen is the most abundant biopolymer in nature, animal skins have been used by humans throughout history. For example, the Inuit made water-repellent gut parkas from similar tissue types. Applying advanced methods of fabrication, including robotic yarn laying and material lamination, a taxonomy of process steps was documented with videos and material samples. Based on our findings, we developed and designed a new generation of water-repellent outdoor jacket.

More and more fundings and networks have emerged to support Design Lab-like entities, and elevating their ideas and visions. Still there is space for improvement. Given the service nature of Design today, we believe, corporations will play an important role in tapping into the potential of Design Labs. Clearly the convergence of planetary design strategies and technological innovation results in business

opportunities that have the possibility of transforming industries. If real change is what we are aiming for, we believe that a plurality of approaches is the way to go. Instead of following the linear pathway of growth and scalability, Design Labs can invent and produce according to local and regional conditions. Many approaches will lead to many solutions that result in a more resilient, problem-solving approach. Long-term visioning, a shift from human-centered approaches to planetary design strategies, and design leading away from convenience towards impact and balance, are at the core of these environments. Instead of producing objects and goods, Design Labs will establish frameworks in which the flow of information is distributed evenly and democratically, allowing for more participation in decision making processes. A Design Lab is an institution, space, collective (though it might even consist of just one person) that uses Design or Design Research methodology to collaboratively overcome disciplinary silos and in order to tackle complex challenges through prototyping. In doing so, Design Labs bridge the gap between speculation and application. They will play a key role in shaping not only what our future will look and feel like, but also who can participate in that process.

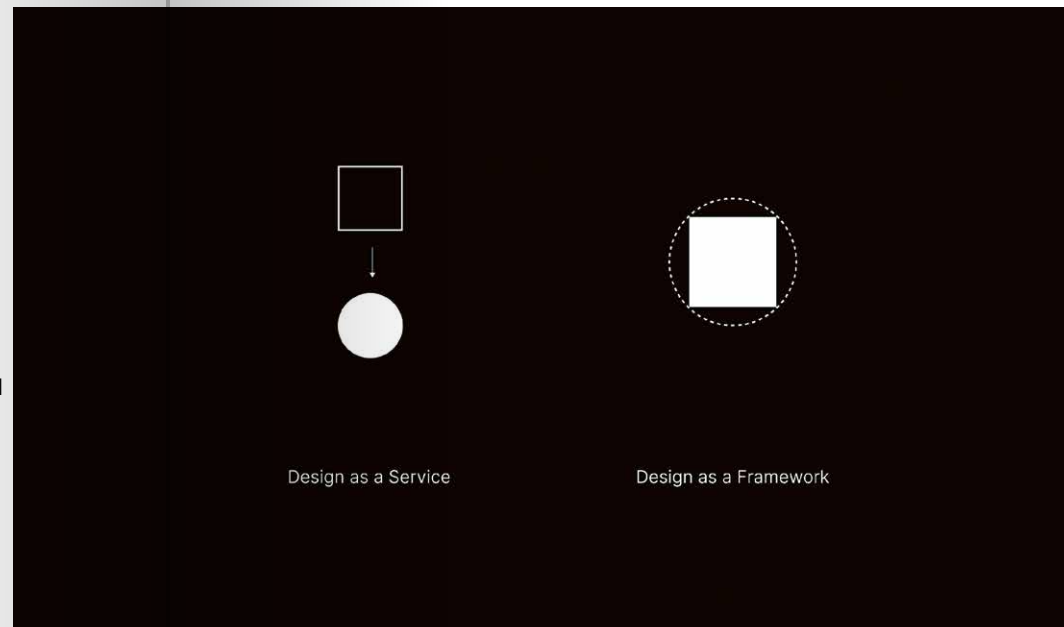


Diagram from service to framework. © WINT Design Lab, 2022.

Judith Glaser is a trained goldsmith with professional experience in Germany and abroad; she holds a Master's degree in product design with a focus on interaction design from weißensee school of art and design berlin (khd). For more than five years, she has worked for Studio NAND, a Berlin-based design studio specializing in data-driven user interfaces and interactive technologies. This work, as well as her teaching activities for the interdisciplinary project format Coding IxD, led to her research interest in competencies and constellations of knowledge at the intersection of design and computer science. Since October 2021, she has been a visiting professor in the Product Design Department and an Associated Investigator at the Cluster Matters of Activity.

JUDITH  
GLASER

# HyperHaptics – Teaching Design as Research

## A Studio Report on the Teaching of Design as Research in Interaction Design Education

Understanding design as an academic epistemological process was for a long time not self-evident. Yet the discipline has changed. In retrospect, the historical separation of 'research' and 'art and design' stands on shaky legs. Design, including its multitude of practices, makes a legitimate claim to be involved in producing new knowledge. At the same time, other academic disciplines are increasingly interested in the processes of design and its epistemological potential. Consequently, (academic) research is becoming more and more of a professional option for designers. Thus, the question arises: How can this comparatively young and highly dynamic self-understanding be taught in design education?

The following contribution provides an introduction to the semester project *HyperHaptics – Oscillating Between Physical and Virtual Tactility* and reflects on its coursework as a possible framework for teaching design as research.

### IN A NUTSHELL – DEFINING 'DESIGN AS RESEARCH'

In his pioneering 1993 speech, *Research in Art and Design* at the Royal Collage of Art in London, British cultural historian Christopher Frayling forcefully wondered why 'research' and 'art and design' were thought of separately.<sup>1</sup> Using stereotypical role models of artists and engineers, he illustrates the misconception of this separation. He develops three categories of design and artistic research: 'Research into Art and Design', 'Research through Art and Design' and 'Research for Art and Design.' The naming and definition of these categories have constantly changed in the discourse since then.<sup>2</sup>

Concerning interaction-design in particular, and its proximity to human-machine interaction (HCI), 'research through design' seems to be the category by which the specifics of design as research are most often discussed.<sup>3</sup> Frayling himself lists examples of projects in the field of materials research or the use of technology in new ways, e.g., in contexts that were not previously considered.<sup>4</sup> The approaches are as versatile and heterogeneous as design processes themselves.<sup>5</sup> As before, the 'Designerly Way of Knowing'<sup>6</sup> and related specifics,

1 Christopher Frayling, "Research in Art and Design," in *Royal College of Art Research Papers*, Vol. 1, 1993.

2 Pieter Jan Stappers and Elisa Giaccardi, "Research through Design," in *The Encyclopedia of Human-Computer Interaction*, edited by Soegaard, M. & Friis-Dam, R., The Interaction Design Foundation, 2017.

3 See the work of John Zimmermann a. o.: John Zimmerman, Jodi Forlizzi, and Shelley Evenson, "Research through Design as a Method for Interaction Design Research in HCI," in *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, ACM, San Jose, 2007, 493-502; John Zimmerman and Jodi Forlizzi, "Research Through Design in HCI," in *Ways of Knowing in HCI*, ed. Judith S. Olson and Wendy A. Kellogg, Springer, New York, 2014, 167-89.

4 Christopher Frayling, "Research in Art and Design," in *Royal College of Art Research Papers*, Vol. 1, 1993.

5 Bernhard E. Bürdek, *Design - Auf Dem Weg Zu Einer Disziplin*. Verlag Dr. Kovac, 2012.

6 Nigel Cross, *Designerly Ways of Knowing*. Design Studies, 1982, 221-227.

such as the role of the prototype,<sup>7</sup> the ‘Wicked Problems’<sup>8</sup> or that of reflection,<sup>9</sup> are much discussed. To keep it brief, the contribution works with the following definition, as it skillfully encompasses the diversity of design processes and clearly defines the objective:

“Research through Design (RtD) is an approach to conducting scholarly research that employs the methods, practices, and processes of design practice with the intention of generating new knowledge. [...] RtD asks researchers to investigate the speculative future, probing on what the world could and should be.”<sup>10</sup> This is accompanied by the expectation that perspectives such as manufacturability and distribution, the integration of the product into a product line, and the impact of the product on a company’s identity, for example, are relegated.<sup>11</sup>

## HOW TO? – TEACHING ‘DESIGN AS RESEARCH’

In semester projects framed by a given course topic, students in the product design department at weißensee school of art and design berlin are developing their design skills and a portfolio. The portfolio will later be crucial for professional positioning in the job market. Students from different years of study (Bachelor’s and Master’s) work together on semester projects; this can be done individually or in teamwork. The project *HyperHaptics*<sup>12</sup> was conceived to introduce design students to a research-driven, i. e., new knowledge-generating, understanding of design.

### HYPERHAPTICS – THE OBJECTIVE

The subject of HyperHaptics focused on the design of haptic interactions and even multisensory experiences. The goal was to develop a sensorium that discusses haptic experiences at the interface of physical and digital reality through various experiments and prototypes. The course documentation states:

“Tactile sensations generate the deepest and most emotional kind of contact between individuals and are therefore essential for immersive virtual experiences. (2) We understand ‘virtual reality’ not only as a collective term for dedicated technologies, but also as the digital

<sup>7</sup> Jörg Petruschat, *Common Prototyping – Einige Bemerkungen über das neue in der Entwurfskultur des Prototypings*, 2013.

<sup>8</sup> Richard Buchanan, “Wicked Problems in Design Thinking,” in *Design Issues* 8, No. 2, 1992.

<sup>9</sup> Phoebe Sengers et al., “Reflective Design,” in *Proceedings of the 4th Decennial Conference on Critical Computing: Between Sense and Sensibility*. Association for Computing Machinery, New York, 2005, 49–58; Donald A. Schön, *The Reflective Practitioner: How Professionals Think in Action*, Routledge, London, 2017.

<sup>10</sup> John Zimmerman and Jodi Forlizzi, “Research Through Design in HCI,” in *Ways of Knowing in HCI*, ed. Judith S. Olson and Wendy A. Kellogg. Springer, New York, 2014, 167–89.

<sup>11</sup> Ibid.

<sup>12</sup> HyperHaptics was conducted by Judith Glaser and Felix Rasehorn in the Winter term of 2020/21. The project took place in cooperation with the eLab headed by Felix Groll and was supported by Prof. Carola Zwick as well as the experts Dr Olivier Bau (Computer Science), Paula van Brummelen (Textil- and Surfacedesign), Dr Maxime le Calvé (Anthropology) and Christoph Volbers (Product-Design). For further information, visit <https://hyperhaptics.designing-interactions.de/> (Accessed June 11, 2022).

<sup>13</sup> Carola Zwick, Judith Glaser, and Felix Rasehorn, *HyperHaptics – Oscillating between Physical and Virtual Tactility*, 2021, 2.

<sup>14</sup> M. Lewis, “A Framework for Introducing Emerging Technologies in Design Studio Class,” in *Design & Pedagogy, Research & Education in Design: People & Processes & Products & Philosophy*. Lisbon, Portugal: Taylor & Francis Group, 2020, 41–48.

<sup>15</sup> Stappers and Giaccardi, *Research through Design*.

<sup>16</sup> Bürdek, *Design – Auf Dem Weg Zu Einer Disziplin*.

<sup>17</sup> More on this method can be found under the keyword: Agile Software Development. <https://www.visual-paradigm.com/scrum/what-is-agile-software-development/> (Accessed June 11, 2022).

enrichment of physical spaces and objects with multi-sensual levels of information. The aim of the project is to explore the extent to which virtual realities can generate not only equivalent but completely new ‘hyper-realistic’ experiences by means of synaesthetic stimuli.”<sup>13</sup> Another learning objective, in addition to the thematic focus and the concept of ‘design as research,’ was the introduction to interaction design using interactive technologies. A particular emphasis was on microcontrollers and sensors from the field of physical computing and augmented reality (AR) and virtual reality (VR) technologies. Students should acquire (1) an understanding of the possibilities of these technologies, (2) a sense of what is feasible or rather too time-intensive to implement, and (3) a certain self-confidence in using these technologies.<sup>14</sup>

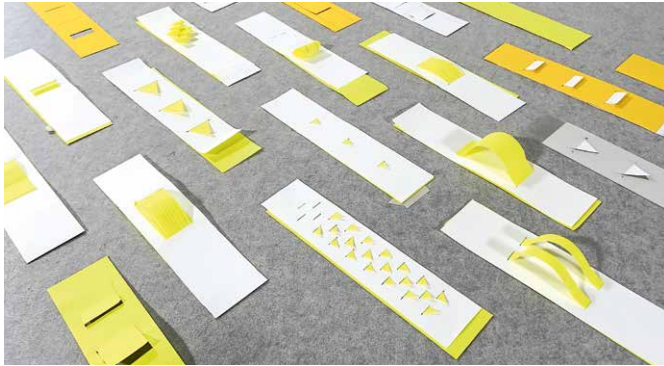
### HYPERHAPTICS – THE PROCESS

First, HyperHaptics moved away from the ‘typical’ course of a product design project, which usually ends with one design.<sup>15</sup> Of course, it is not unproblematic to speak of ‘typical.’ Bürdek has addressed the heterogeneity of design processes.<sup>16</sup> The attribute here refers to the design of a product in the sense of a ‘design solution’ in contrast to ‘new knowledge’ as the result of the design process. The idea was that students should have ‘no time’ to elaborate their experiments and explorations on products and deal with product dimensions like production and distribution. They should be able to devote their attention solely to exploration and gaining knowledge. This focus on exploration is admittedly a substantial simplification of knowledge production in design because a. o. new knowledge can also be embodied in a ‘final’ design, as Fraying puts it. Nevertheless, moving away from the ‘final product’ was meant to generate free space for students.

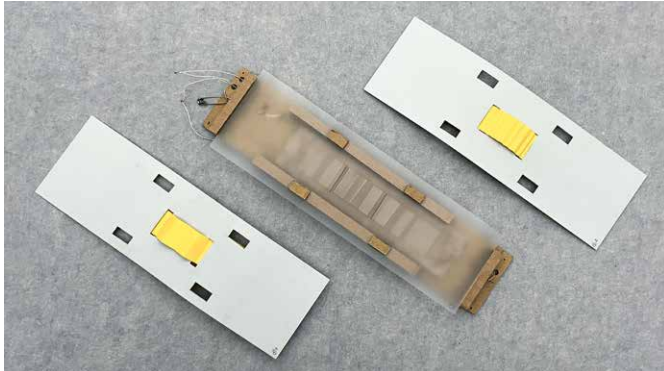
Consequently, the course was divided into experiments with the help of which the students were to explore the limits of multi-sensory experiences. These experiments were organized into three design sprints. A ‘sprint’ is a short, clearly delimited period in which work is done to complete a specific task (here, experiments). This method was initially designed to develop complex products like software.<sup>17</sup>

Each sprint in *HyperHaptics* had its own thematic and technological focus:

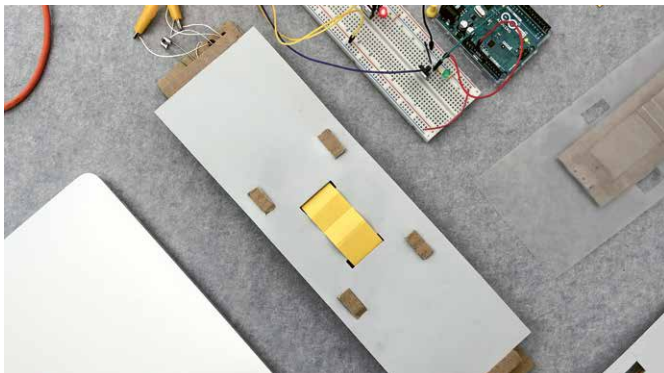
– Sprint 1: “Micro Motions – The 1st sprint investigates the richness of motions on a micro-level, reaching from ASMR via tropism to the pupillary light reflex and its potential to augment our perception. The medium of choice for creating these subtle yet strong responses are shape memory alloys (SMA).”<sup>18</sup>



← *Rumbling Cookies* by Tal Sznicer examines how a haptic dimension might make users more aware of a digital activity. Texture studies in paper translate the onomatopoeia “rumble” to a haptic surface. © Tal Sznicer.



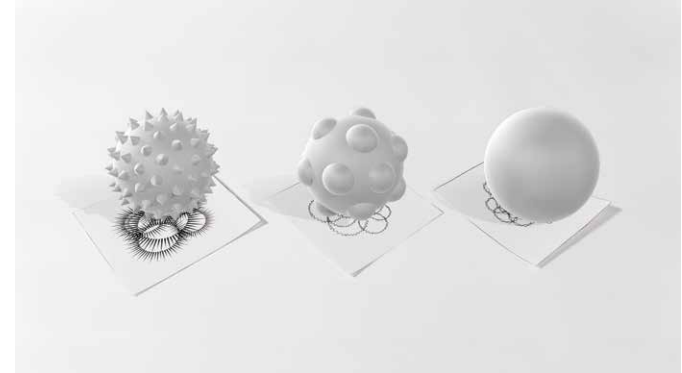
← The mount in the center allows the different textures to be set in motion, first manually, later by means of digital input. © Tal Sznicer.



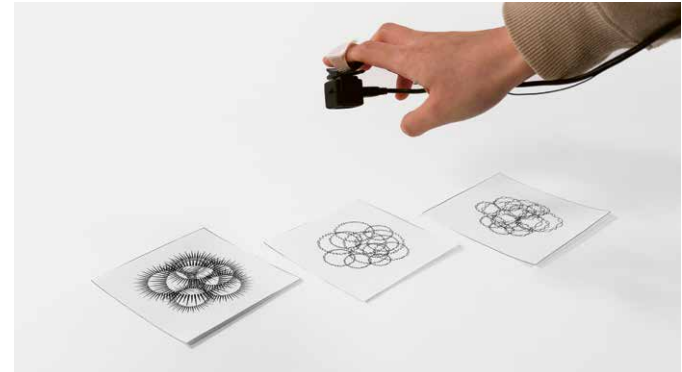
↙ The technical setup includes multiple studies in paper, the mount, a microcontroller, actuators made from a smart memory alloy, wiring, and a power supply. © Tal Sznicer.

– Sprint 2: “Haptic Vision – During the 2nd sprint, we were interested in the recombination of senses to model richer experiences, including multiple senses. [...] The students were asked to develop concepts to augment human sight with the support of AR technologies.”<sup>19</sup>

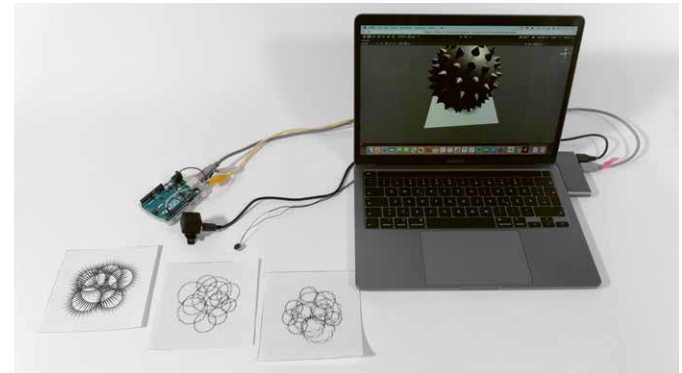
→ *Touch Virtual Objects* by Ran Zhang seeks to enable users to touch invisible data represented through virtual objects (spheres). © Ran Zhang.



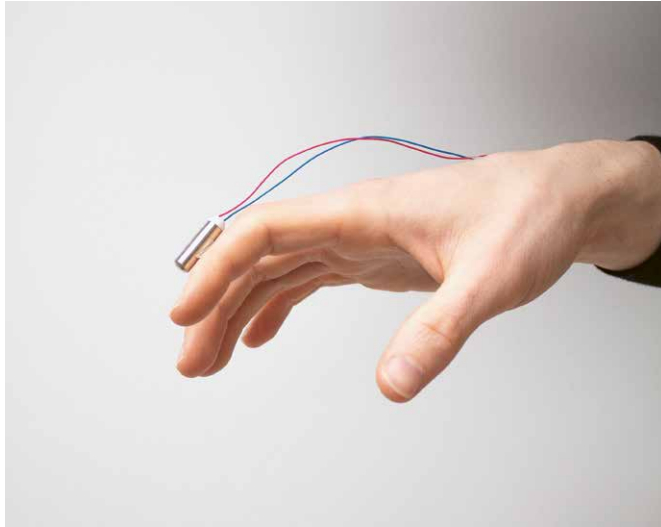
→ The virtual and physical worlds are interconnected using image targets and camera vision, maintaining the skin's capability to touch and feel simultaneously. © Ran Zhang.



↘ The 'surface' qualities of the virtual sphere are translated into a specific vibration pattern and applied to the user's fingertip. © Ran Zhang.

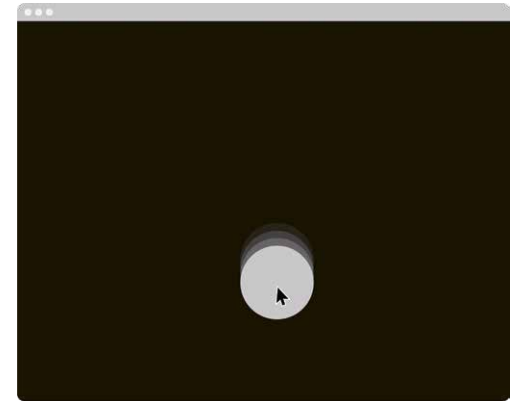
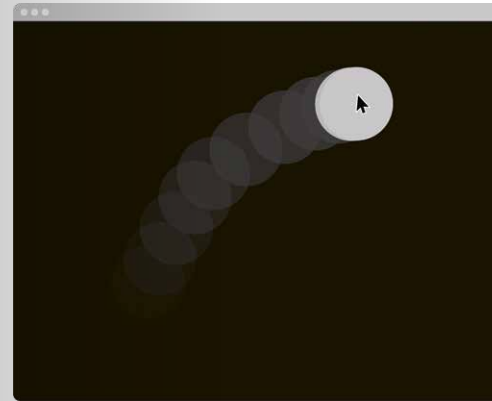
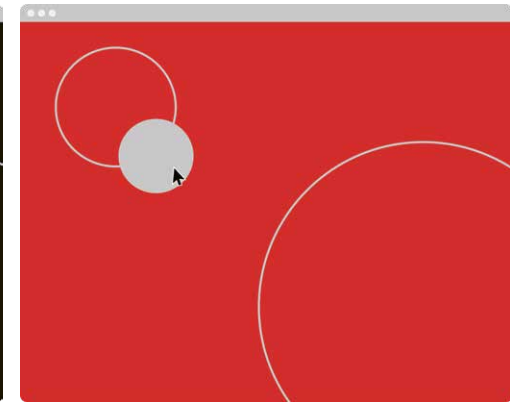
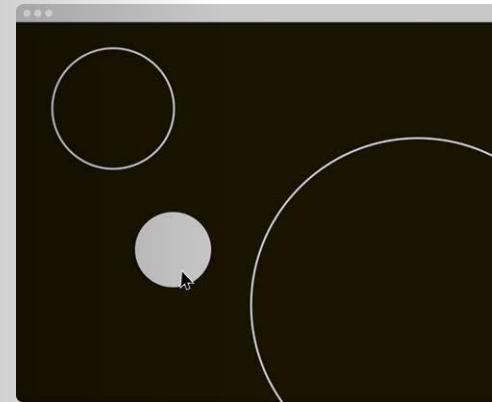
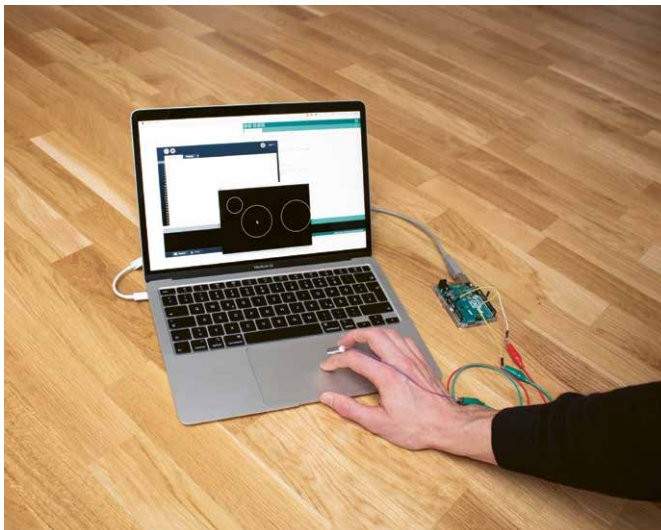


— Sprint 3 : “Pseudo Haptics — The 3rd sprint focused on the mutual relation between visual and haptic perception to investigate haptic illusions. [...] The students were asked to experiment and come up with short interactive stories that combine physical objects, actuators, vision-based object tracking, and computer graphics.”<sup>20</sup>



← *Fitness Coach* by Johannes Schmidt investigates to what extent the sense of touch can enhance screen-based interactions. © Johannes Schmidt.

↙ The technical setup connects the cursor of the desktop as input, via a microcontroller, with the output, a vibration motor. © Johannes Schmidt.



↑ Various experiments explored how it might feel when two virtual objects collide, or a virtual weight or resistance is applied a. o. © Johannes Schmidt.

Each sprint lasted three weeks, with the first week dedicated to the thematic and technological introduction. In hands-on workshops, students were asked to manifest their thoughts in physical objects. The second and third sprint weeks consisted primarily of work and consultation time, each ending with a presentation. While the interim presentation in the second week served to discuss the work status, conceptual or strategic considerations, existing challenges or initial findings, the focus of the final presentation at the end of the third week was on the systematic assessment, reflection, and presentation of one's own process and its results. The sprints were accompanied by introductions to design as research, process documentation, insight representation, and text work across the board.

To allow the students to deepen ideas and findings made in one of the first three sprints or to pursue others, the course ended with a fourth sprint. In this sprint, the students were free to develop their series of experiments further, start new ones, or transfer them into product or interaction concepts.

#### HYPERHAPTICS – A REFLEXION

The sprint format was misused insofar as the sprints did not build on each other iteratively as intended.

This worked surprisingly well in terms of maintaining a more research-driven and exploratory project character.

The sprint results indicated product character, but most approaches remained conceptually and formally at a distinctly experimental level.

Although the sprint format and the research intention of the project were communicated beforehand, and the student's attention was directed to their research process rather than the 'results', an increasing uncertainty among the students became apparent.

This may be because a phase of 'open-ended exploration' at the beginning of a project is a 'known procedure' in the design process, yet it is then followed by conceptual and formal elaboration. Due to the thematic restart with each sprint, this elaboration was less linear in *HyperHaptics*. At interim presentations, in particular challenges and problems in classifying the purpose, objective, and relevance of their experiments were often clearly addressed by the students. The questionnaire initially developed for the course documentation proved to be a great reflection aid (or emancipation tool):

1. *What are you searching for? (Research Question)*
2. *How do you approach the sprint? What are you using? e.g. materials, ways of working, equipment (Methodology)*
3. *What aspects do you work with/do you change to achieve your goal? e.g. speed, distance, material; What units did you use to measure the parameters? e.g. grams, volts, cm (Parameters)*

4. *What was the link between your increased/decreased chosen parameters and the sensory effect it created? i.e. more energy = higher vibration frequency = a perceived sense of aggression/force*
5. *What didn't work? / What was unexpected in terms of your design and the effect/perception it created? (Findings)*

The 'permission' to take risks was emphasized, as was the value added (for themselves and others) of documenting successes and failures. Nevertheless, the results of Sprint 4 clearly show the students' desire to turn their experiments into applications. The rapid succession of sprints made it necessary to develop a systematic documentation routine. Due to the lack of an 'end product,' the focus of documentation could also not be placed at the end of the semester. As a result, developing a process and documentation aesthetic became more critical. To support this process, reference material was reviewed and discussed, and tools such as different colored back drops, photo lighting, and tripods were provided throughout the course.

The topic of documenting is followed by a significant challenge: publishing the results of research through design. In 2017, Gabriel Wurzer and colleagues evaluated eCAADe<sup>21</sup> contributions from 2014 to 2016. "We know from practice that the research cultures of design and science need different modes of reporting about their work."<sup>22</sup> In their study, the authors contrasted 'What designers want' (e.g. *A picture gallery; Credits in addition to references; Less structure, more freedom*) with 'What scientists want' (e.g. *Text, text, text; Tables and formulas; A lot of references*). A recurring theme was the importance of visual material and crediting prior design work. "[D]esigners put figures in because they are the actual content and source of inspiration for others."<sup>23</sup> The resulting image-text ratio and necessary freedom in layout can be flexibly defined within course documentations, such as from *HyperHaptics*, yet often remains an obstacle in the research communities outside of design.<sup>24</sup> But even text writing has limitations when

<sup>21</sup> Conference on Education and research in Computer Aided Architectural Design in Europe (eCAADe), for more information see <https://ecaade.org/> (Accessed June 11, 2022)

<sup>22</sup> Gabriel Wurzer et al., *Contrasting Publications in Design and Scientific Research*, 2017, 394.

<sup>23</sup> *Ibid.*, 392.

<sup>24</sup> It should be noted that disciplines such as HCI responded to the demand for more visual material in conference contributions by introducing the Pictorial. See, for instance, the annual conference on Tangible Embedded and Embodied Interaction (TEI): <https://tei.acm.org/2021/participate/> (Accessed June 11, 2022).

it comes to making the knowledge gained through design accessible, for example, thinking about the aesthetic qualities of interaction or the physical quality of a material study. However, even in such a concise setting as the product design department at weißensee school of art and design, there are no satisfactory approaches to solving these challenges – yet. In a final joint feedback session, not only the course results but also the course format as such were discussed.<sup>25</sup> The students perceived the sprints' speed and sequence as particularly challenging. Lack of time for reflection and detours and the additional burden of confrontation with unfamiliar technology were cited as the leading causes. It was often only after the three weeks had elapsed that a degree of confidence in dealing with technology that would allow the design of a series of experiments was achieved.

The fourth sprint, originally envisioned as a free space for students, ultimately seems to have undermined the course goal of 'design as research' the most. The often strong product character of the results of this sprint tempts an evaluation of the sprint result as a kind of final result instead of seeing it as part of a multi-sensory whole. However, the elaboration time for this 'final result' was only the usual three sprint weeks, which ultimately led to stress and dissatisfaction with the result for a not insignificant part of the students.

#### HYPERHAPTICS – A CONCLUSION

Structuring the project into iterative sprints that do not build on each other but complement each other thematically is a promising approach to keeping the work process explorative throughout a semester. Nevertheless, conveying and maintaining the balance between the 'desire to search for applications' and open-ended experimentation seems to be the biggest challenge. Reducing the project plan by one sprint seems obvious to decrease stress and increase time for reflection. Emerging requirements such as continuous documentation as a crucial contribution of the work can be mediated well from the presented project

structure. At the same time, a quality documentation process is an essential component of professionalization outside of research, e. g. for customer and stakeholder communication in an industrial context. Referencing and/or citing prior design research remains a challenge and will require further elaboration both within and outside the discipline. In summary the objective 'to generate knowledge,' i. e. to do research, does not seem self-evident compared to 'designing a product.' Thus, it remains to be hoped that the presented framework encourages elaboration and/or inspires other concepts that seek to integrate 'design as research' within interaction design education. After all, an essential part of education is to provide insights into and prepare for diverse career opportunities.

George Jaramillo and Sandra Stark are seekicks fellows at weißensee school of art and design berlin,

Daniel Kruse is Research Associate and M.A. Program Coordinator at the Eberswalde University for Sustainable Development.

Together with our colleagues from seekicks – Joe Lockwood, Anastasia Zagorni, Elisabeth Kitzerow, Sophia Pompéry and Birgit Effinger – we are developing experiential learning spaces that foster new qualities for innovation and entrepreneurship at weißensee school of art and design berlin and across institutions and disciplines.

GEORGE JARAMILLO,  
DANIEL KRUSE  
& SANDRA STARK

# Talking Heads: Dialogues Within Collaborative Entrepreneurial Learning Spaces

With the advance of transformative economics in the world, the call for transdisciplinary entrepreneurial learning spaces is becoming necessary across higher education. Particularly, the need for new collaborative practices for art and design students opens a space for new enterprising teaching. Fortunately, weißensee school of art and design berlin (khb) is one of two art schools in Germany to receive *EXIST*–

*Potential Heben* funding by the Federal Ministry for Economic Affairs and Climate Action, the purpose of which is to foster frameworks for innovative entrepreneurial learning and acting. Within khb, these frameworks are brought together on the seekicks platform ([www.seekicks.org](http://www.seekicks.org)).

This piece is a dialogue between George Jaramillo and Sandra Stark from seekicks and Daniel Kruse from the Eberswalde University for Sustainable Development (HNEE). George and Sandra have a background in arts and design research, while Daniel comes from a business background, and is the program coordinator of the master's program *Sustainable Entrepreneurship & Social Innovation* at HNEE. Our conversation reflects on an entrepreneurial learning space that we co-created and executed at HNEE, together with Joe Lockwood, Director of Innovation and Head of seekicks. The learning space introduced a creative pedagogical format of studio-based learning<sup>1</sup> to sustainable entrepreneurship students of the HNEE. Since January 2020, the learning space has been executed five times as a two-week *Seasonal School*. While the format happened at HNEE, it is our intention to familiarize readers with our ways of working across institutions and disciplines and to use these reflections for continuing to evolve collaborative frameworks for students of art, design, and sustainable entrepreneurship within khb and HNEE. We write this piece as a dialogue to maintain the informal nature of this evolving process.

<sup>1</sup> Katherine Cennamo, et al., "Managing the Complexity of Design Problems through Studio-Based Learning," *Interdisciplinary Journal of Problem-Based Learning* 5, no. 2, 2011: 9–27; Jacqueline Cossentino, "Importing Artistry: Further Lessons from the Design Studio," *Reflective Practice* 3, no. 1, 2002, 39–52.

Sandra Stark

I would like to start by asking you, George: how did the *Seasonal School* at HNEE come into being? And why in the context of a business school?

George Jaramillo

The cooperation began in 2019 as a conversation between Joe Lockwood and Prof. Hans-Peter Bendikt of the HNEE, and was based on the question: If the world is constantly in transition, then should education also change to enable new forms of collective learning? Entrepreneurial learning follows a particular way of seeing and working in the world that has enabled a singular, *hero-preneur*.<sup>2</sup> The lone genius type has

<sup>2</sup> Daniela Papi-Thornton, *Tackling Heropreneurship: An "apprenticing with a problem" approach to move us from the social entrepreneur to social impact*, 2016. <https://tacklingheropreneurship.com/wp-content/uploads/2016/02/tackling-heropreneurship-daniela-papi.pdf> (Accessed June 24, 2022).

been a prevalent perspective in design and business that drives potential entrepreneurs to see an opportunity and exploit it by providing a solution to this particular need or problem. Our program challenges not only the entrepreneurial individual, but also critiques the 'design as savior' trope. Here design and entrepreneurship work collaboratively to understand opportunities that are informed by lived experience, working through non-linear processes, and within dialogic collaboration.

In late 2019, Joe contacted me to make plans after his initial discussions with the HNEE. The collaboration initially explored an in-person project-based format using studio design innovation methods,<sup>3</sup> where prototyping connected to the real-world was the basis for engaging with students and stakeholders. We wanted to work beyond linear problem-solving models, standard in business/entrepreneurial spaces, and develop capabilities that understand complex ecosystems and generate future insights. This studio approach eventually evolved into our first prototype, an analog/digital learning space in June 2020 in response to Europe's Covid-19 pandemic.

<sup>3</sup> Enzo Manzini, "Design Culture and Dialogic Design Ezio," in *Design Issues* 32, No. 1, 2016, 52–59.

Sandra Stark

Thank you George! Now I am curious to hear from you, Daniel. How is this studio approach different from formats you have experienced in business schools, and why do you think the collaboration between our different practices is important?

Daniel Kruse

I'm obviously no expert in the practice or theory of design. But what I learned from working with you is that thinking in terms of systems and complexity, coping with uncertainty in the design process and anticipating how futures evolve, as well as critical thinking, are a natural part of your working style. In contrast, modules in business or management programs commonly fail to teach these competencies. This is especially problematic against the background that sustainability issues will increase tremendously over the course of the next decades and managers will certainly have to play a major role in addressing them.

Sandra Stark

I would challenge the notion that these skills are established in mainstream design education and say that the learning spaces we have been working on carry as much innovative potential for design education as they do for business.

Daniel Kruse

Well, I believe that one needs to engage in systems thinking to be successful at addressing complex problems in the face of uncertainty. Unfortunately, business students are used to linear thinking, since much of contemporary strategy research is grounded in classical economics and simplified models of organizational actions. A typical example is causation, an ends-driven decision-making logic that assumes stable environments and involves management to follow a linear and sequential logic of implementing solutions that fit a clearly specified goal.<sup>4</sup> This results in deterministic thinking wiping out dynamic environments in which actors are embedded. This approach implicitly builds on the notion that for every event there is a clear cause and for every action there is a clear consequence. This unfortunately disregards the role of chance and creates the illusion of control among students. As a result, traditional project management assumes that the knowledge necessary to successfully solve a problem can be obtained at the beginning. In the *Seasonal School*, students learn how to navigate interconnected systems. While they might feel overwhelmed by the amount of information from such systems, it forces them to iterate their usually linear decision logic and to integrate diverse knowledge sets to manage complexity.

Compared to the humanities, management students usually do not learn about how to distinguish between different perspectives of ontology and epistemology. This makes it hard for them to understand the reality (ontology) of where their studies are grounded and to critically investigate how the knowledge they engage with was produced (epistemology). In general, most of the students are taught that there is an objective truth that can be observed and measured (i.e. positivism). Interestingly, research on organization theory offers a plethora of epistemologies – the problem is that lectures often follow pragmatism and offer hands-on frameworks and models without questioning their underlying assumptions. This 'under socialized' view of human action is questioned as part of the *Seasonal School* as most of the inputs hold a constructionist view, which assumes multiple realities that are examined through experience and discourse. In this way, students are confronted with several different perspectives on their focal issues and learn to develop their own position.

<sup>4</sup> Saras D. Sarasvathy, "Causation and effectuation: Towards a theoretical shift from economic inevitability to entrepreneurial contingency," in *Academy of Management Review* 26, No. 2, 2001, 243–263.

George Jaramillo

This is true, Daniel, the *Seasonal School* shows a need for new ways of exploring uncertain futures in how we structure our learning environment. Enabling the themes you have shared requires that these environments are adapted to support this approach. Due to the pandemic, our HNEE program was partially established in a digital space and in doing so required challenging the expectations of studio learning and providing new opportunities in the digital realm. Daniel, how do you see yourself entering these new (digital) transdisciplinary learning spaces?

Daniel Kruse

Based on my personal experience with digital learning environments, I prefer in-person teaching. During the last two semesters at HNEE, students often did not actively engage in digital learning environments, which I found very frustrating. Working with them in person would have helped me tremendously to better understand where they were coming from and what their learning needs were. At the same time, I see the benefit in further including international perspectives represented in virtual learning spaces that are space-independent. During last year's *Winter School*, one important outcome was that we should ideally strive to integrate the best of both worlds: students used digital technology to access learning materials, and to talk to international experts while meetings happened in person. George, what is your experience with these analog-digital learning environments?

George Jaramillo

I experienced a slow uptake in using digital technology to teach before the pandemic. This contempt of having to adjust teaching methods to this new space really made it difficult to be accepted, however, the pandemic forced the hand of digital technological training. The reversed classroom, hybrid in-room activities merged with online tests, have become the norm. Our own *Seasonal Schools* went through that transition, as what was originally planned as an in-person event turned into a digital studio experience.<sup>5</sup> Individual support, hybrid activities off-screen combined with the online engagements you described, really pushed these two approaches together. It is now understood that online/hybrid learning is a valuable and effective way of teaching. We must keep abreast of issues such as digital poverty, internet deserts and

<sup>5</sup> The website for the *Seasonal School* <https://danielkruse2.wixsite.com/dfef2020>. (Accessed January 25, 2023).

the inequalities expected from higher speed to lower bandwidth connections. These issues show the need to make a more socially cohesive and innovative digital teaching space. I am looking forward to the way that our collaborative learning spaces bring about these new pedagogic practices.

## TOWARDS SEEKICKS APPLICATIONS

This discussion shows an approach towards shaping cooperative spaces, between colleagues, students, and our respective institutions. Establishing new thematics, by our khb team along with Joe, Sandra and George, the conversation highlights the need for collaboration in complexity, looking at various applications of methods across disciplines, and forcing people out of their 'silos'. This is what we are aiming for with the seekicks platform and the frameworks with HNEE and other institutions. A statement from sustainable entrepreneurship students shares this desire:

"One of our biggest learning outcomes is the realization that the future is *shapeable*. In the media, certain future developments are often depicted as given... we learned to critically observe such narratives and become narrators ourselves."

It's important to hear that students left the module with a sense of self-efficacy, and it makes us excited and hopeful. Excited that even in a short amount of time, it is possible to create momentum for change and hope, because by creating these new learning spaces, we as teachers, researchers and collaborators are able to shape the future ourselves. Furthermore, the iterations of different *Seasonal Schools* has influenced our design spaces as is present in the next stage of the seekicks format *startup studio*. In particular, we can bring this gentle critique of the 'lone designer/artist' into our own art and design disciplines and truly focus on the collective learning and making. As we move ahead with our seekicks programs and the ongoing relationship with HNEE and khb, we hope to see further experimentation between entrepreneurs and designers, collectively challenging the disciplines and opening new paths within the global changes ahead.

Elaine Bonavia is an architectural design researcher, working at the intersection of computational design, art and technology. She has curated exhibitions and previously worked extensively within the self-organized international European Architecture Students Assembly (EASA). During her studies, her research focused on adaptive architecture and simulation of bending-active gridshell structures. She is a complex modelling specialist and has worked on the design and construction of various architectural pavilions through the development of computational tools and material research. As a student and after, she was actively involved in various research projects at the University of Stuttgart within the Institute for Computational Design (ICD) and Institute for Building Structures and Structural Design (itke). Since 2020, she has been teaching in the Textile and Surface Design department at the weißensee school of art and design berlin, where she is currently involved in research on using AR in the construction of filament-based architectural material systems within the Cluster of Excellence Matters of Activity, as well as investigating traditional textile production processes from the perspective of embodied interaction.

ELAINE  
BONAVIA

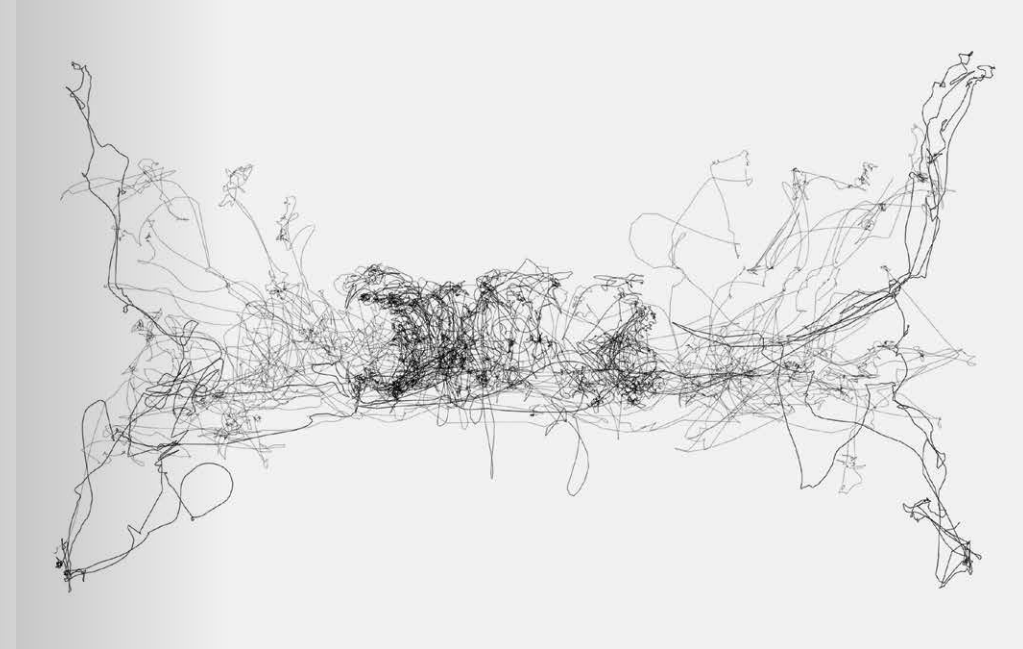
# Spatial Drawing: Body, Machine and Movement in Practice

## INTRODUCTION

This article describes my experience teaching and engaging with body drawings by exploring drawing as a spatial medium, as part of the ongoing artistic research project *Tracing Textility*. The project began after the revelation of unanticipated movement recordings: traces left behind by students and researchers involved in the MoA design studio *Minimal Machines I*,<sup>1</sup> which explored the possibilities for augmented and non-augmented spinning on an architectural scale. These drawings told the story of an experimental approach to architecture created by threading yarn in space, similar to silkworms spinning cocoons in nature. Subsequently, the seminars in *Zeichnen, Farbe, Fläche III* taught in the Textile and Surface Design Department at the weißensee

<sup>1</sup> Minimal Machines was a design studio organised through the Cluster of Excellence "Matters of Activity," Humboldt-Universität Zu Berlin <https://www.matters-of-activity.de/en/activities/6157/minimal-machines-1> (Accessed January 25, 2023).

school of art and design berlin became *Spatial Drawing*, where the idea was to explore how body movement and machine vision could come together to make way for artistic experimentation. In these seminars students are also taught drawing and representation techniques through 3D modelling and computational design thinking.



Spatial drawing of an architectural installation as part of the ongoing research project *Minimal Machines I*. © Elaine Bonavia, Jessica Farmer, Karola Dierichs / weißensee school of art and design berlin, Cluster of Excellence Matters of Activity, Humboldt-Universität zu Berlin.

Drawing is one of the most ancient human practices and a universal way of communicating ideas. While for centuries, drawings have been mainly produced on two-dimensional surfaces, contemporary technologies allow us to take drawing into three-dimensional space: manifesting the potential of drawn lines and extending the threshold of exploration between line and space.

The ideas for the seminars in *Zeichnen* rooted from a curiosity to explore how we can use our bodies and spatial perception to engage with digital drawing. What kind of drawing does a body line create? How can body lines be explored further through a digital environment? And what more can these embodied digital objects and sketches say than what other (analogue) lines say? These questions were brought about by the rigid nature of digital drawing, coming into contact with the affective experience of drawing something in the air, where the sense of freedom and the notion of virtuality are very present. In the same sense as

Massumi's definition of the virtual,<sup>2</sup> spatial drawing 'is not contained in any actual form assumed by things or states of things. It runs in transition from one form [physical sketch] to the other [virtual sketch].'

When drawing in space, one experiences every drawing gesture more consciously and the feeling of drawing under surveillance – or rather, *with* a 'technical apparatus' – is always very present. This shared experience is also a channel for conversation and speculation between the analogue-digital worlds, similar to how Ingold describes in his theory of lines and their inherent active nature:

'Thinking about lines is linked to a process perspective, to the idea of a world in becoming, because the line is not just something that points to how things have been, but also points to possible ways in which things will go'<sup>3</sup>

The first edition of the seminars in Zeichnen focused on the exploration of methods – a sort of digital version of *Process Drawing*. Starting as a practice-based PhD research project by architect and educator Riet Eeckhout, *Process Drawing* examines drawing as 'a verb in the present continuous.'<sup>4</sup> Eeckhout uses drawing to explore subjects in both a subjective and speculative way, through a deep awareness of her unconventional techniques which are fundamentally observational and linked to the temporal aspects of drawing-making. Sketching room-long works on rolls, Eeckhout sometimes uses projections from moving image to explore subjects very intensely in the process of carving out new works.

The second edition of the class (which was in progress at the time of writing), is focused more on drawing objects and creating narratives through geometric modelling and animation.

<sup>2</sup> Brian Massumi, "Sensing the Virtual, Building the Insensible, Couplets, Travels in Speculative Pragmatism," in *Parables for the Virtual: Movement, Affect, Sensation*. Duke University Press, Durham, NC, 2002.

<sup>3</sup> Tim Ingold et al., "Lines, Drawings and the Human Condition," <https://drawingmatter.org/lines-drawings-the-human-condition/> (Accessed January 25, 2023).

<sup>4</sup> Riet Eeckhout, *Process Drawing*, RMIT University, 2014. <https://researchrepository.rmit.edu.au/esploro/outputs/doctoral/Process-drawing/9921863649201341#file-0>. (Accessed January 25, 2023).

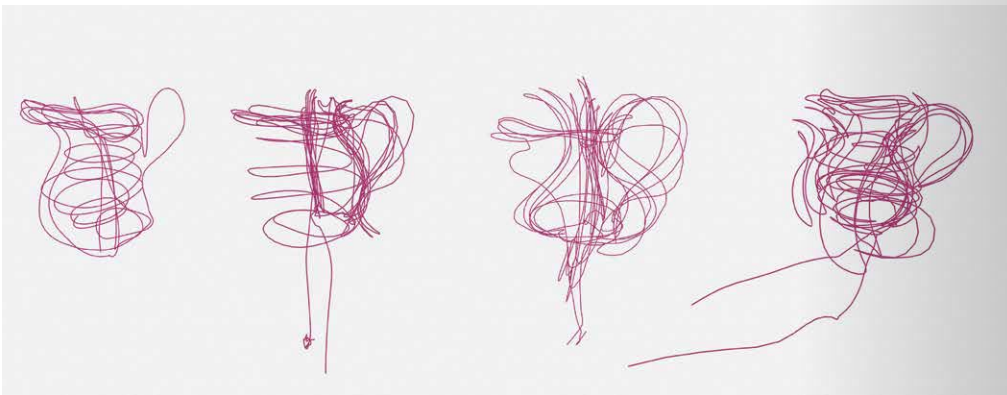


Different viewpoints of body-scale drawings, as seen in virtual reality during the iterative drawing process. © Elaine Bonavía and Olga Kushynk / weißensee school of art and design berlin.

## DRAWING PROCESS

Spatial drawing entails feeling moments of intentionality within oneself or the environment. It is a continuous, conscious exploration of a line in becoming – an engagement with oneself, with one's immediate surroundings and with an elusive medium of possibilities.

Drawing in the air generates a further sense of openness and unpredictability than with typical drawing. Using the whole body and going beyond the hand gives a lot of freedom to engage with lines playfully and surround the sketch, while at the same time, it also calls for an intensive awareness of space and the progression of things.



Berlin-based artist Monika Gryzmala has been working with her concept of (analogue) *Raumzeichnen* for over a decade, mainly using tape and producing large scale installation works. In describing her practice, she says that ‘*being in good disposition*’ and ‘*staying on a certain path*’<sup>5</sup> is part of what gives her a sense of order.

Exploration of four different spatial drawing techniques used to experiment with drawing the same object. © Elaine Bonavia / weißensee school of art and design berlin.

Yet, doing spatial drawing with a digital medium implies that the engagement with any part of the sketch is ultimately always accessible, either through a 3D program or Virtual Reality. Drawings stretch out over space and time and so the sketch-making process itself becomes a subject of interrogation. In the seminars, students are asked to develop a sketch of the same object iteratively, allowing an acquaintance to develop and the engagement with parametric drawing and digital modelling to be nurtured in the same way that the hand holding a pencil starts to understand proportion of a paper through repetition, practice and improvisation. Parametric scripts are modified and used to dissect, frame, examine and relate with the spatial drawing and the experience of making it.

This process forces the designer to pay attention to the structure and character of the digital drawing both while it is *in* formation, as well as after – something which is difficult to achieve in some command-line CAD programs like Rhino and AutoCAD, which have dominated digital drawing and drafting techniques in the design, architecture, and engineering industries for decades.

<sup>5</sup> Stephanie Buhmann, “Monika Gryzmala” in *Berlin Studio Conversations - Twenty Women Talk About Art*, 2017.

The setup for drawing spatially consists of a hand-held (or body-strapped) inside-out tracker, a laptop connected to an optional projection of the sketch, and some room. The orientation of the tracker during the process plays a role in the possibilities of further forming and transforming the drawing in digital space. Moreover, the speed at which a line is drawn is also captured by the machine and can be seen in the point spacing. This is also directly dependent on the script setup and the capacities of the laptop being used at the time.

During the seminars, the question of how to relate to the sketch while drawing was something which came up in conversations of how to organize. Most students chose to keep the projected work-in-progress sketch in proximity, but not directly in view. This reductive method seemed to promise a more manageable situation. Students preferred to engage with space, time, movement and their imagination, allowing themselves to cultivate their own sense and sensibility through the journey of not knowing.



Spatial drawing of a fashion accessory from Yoruba Culture. Structure and possible geometric transformation of the spatial drawing. © Jasmin Sermonet and Elaine Bonavia, weißensee school of art and design berlin.

## DRAWING RELATIONS

As another design turn unfolds, the topic of relationality and interaction is becoming more important, as artistic research and other creation methods that go beyond hylomorphism are starting to open up new perspectives in a post-humanist world of design.<sup>6</sup> From this standpoint, the seminars in *Zeichnen* are interesting because they question the status quo of what *digital drawing* is supposed to be in the context of teaching art-design students who primarily work with hand models and material experimentation.

<sup>6</sup> Patricia Ribault, *Design, Gestaltung, Formativität: Philosophies of Making*. Birkhäuser, Berlin, 2022. <https://doi.org/10.1515/9783035622447> (Accessed January 25, 2023).

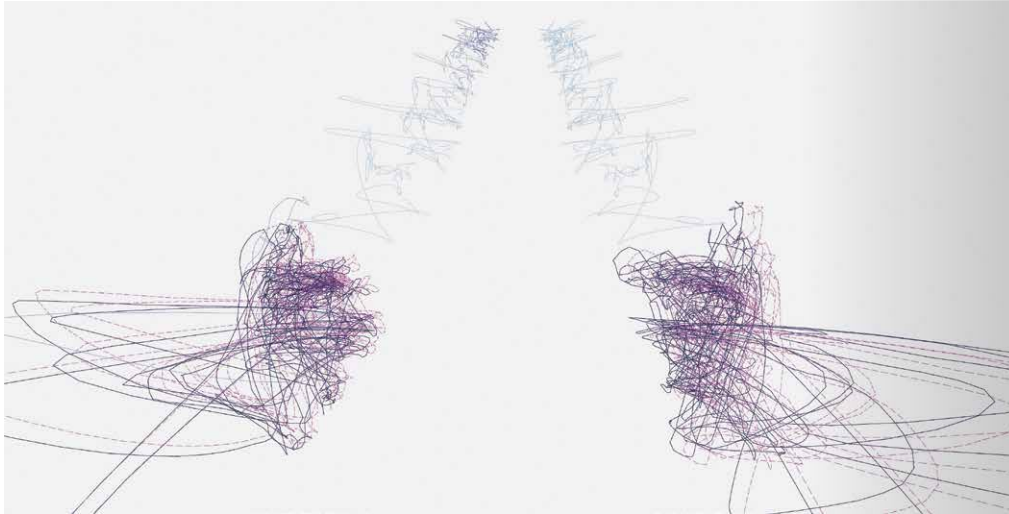
Analogue practices are often methodologically so far from Digital working methods that it is difficult to reconcile the two approaches without causing confusion or forcing an inclination to either one camp or the other. Beyond this, I think the notion of treating machinic data as a medium which is intrinsically active, agential and somehow even *participatory* in the creation process may be an interesting way to explore the gap between analogue and digital drawing.

Entrusting that a moment of creation or a design process can be shared *with* machines, and what this multiplicity might bring to a creative work is one of the underlying themes in this project. The drawing is registered in a CAD program in real time while the human and machine(s) engage – simultaneously – in a dialogue with space and time, within an experience of collective image-unfolding. This multiplicity inscribes a relation between the experience of the drawing-making and the 3D sketch.



*Koordination*– an ambidextrously drawn spatial sketch which explored different rhythms of body movement and line textures. © Paolina Bumedner and Elaine Bona-via, weißensee school of art and design berlin.

Each tracked point is oriented, positional information which bears an automatic relation to time, and is instantiated by its potential to generate images that could carry emergent image-effects. The eyes of the machine become the source code for forms which transform an image into another image, or a model into another model. For me, this is effectively the making of a post-image, defined by new materialists Remi & Marie as 'an operation and a process rather than a representation.'<sup>7</sup>



## CONCLUSION

The seminars in *Zeichnen* have been a hands-on and an intimate way explore drawing and image-making with technology. It's also been a basis for the exploration of teaching methods which lean closer to creative-coding culture and practice, where 'the goal is not predefined, and the process is based on discovery, variation, and exploration of mostly unexpected results.'<sup>8</sup> For me, spatial drawing is also a lens through which to engage with digital media and computation in a tangible, corporeal way that does not prioritize functional design and efficiency, but rather opens space for creativity, affective experience and collaboration.

Body drawings of repetitive hand-weaving movements while making a plain weave on a table loom. © Elaine Bonavia / weißensee school of art and design berlin.

<sup>7</sup> Ingrid Hoelzl, Rémi Marie, *From Softimage to Postimage*. Leonardo 2017; 50 (1): 72-73. doi: [https://doi.org/10.1162/LEON\\_a\\_01349](https://doi.org/10.1162/LEON_a_01349)

<sup>8</sup> Tim Rodenbroeker, "What is creative coding?, part of Creative Coding als Schule des Denkens, Masterarbeit, Fachhochschule Bielefeld," in *Digital Media and Experiment und Kommunikationsdesign*, 2022. <https://master.timrodenbroeker.de/vorwort.php> (Accessed January 25, 2023).

These seminars are also linked to my artistic research project *Tracing Textility*, which looks at the intersection between tacit knowledge and digital technologies by questioning how body data can be linked to the traditional craft of weaving. This project involves tracing the regular, repetitive movements of the body and exploring how this information might possibly become moulded into a process of textile (and also image) production through a concurrence of analogue-digital forces. The event of weaving on a table loom, an ancient machine that has threaded itself throughout history, thus sets the scene to explore how material, machine and the body come together in a deeper way, exploring the *intra*-activities between human and non-human entities.

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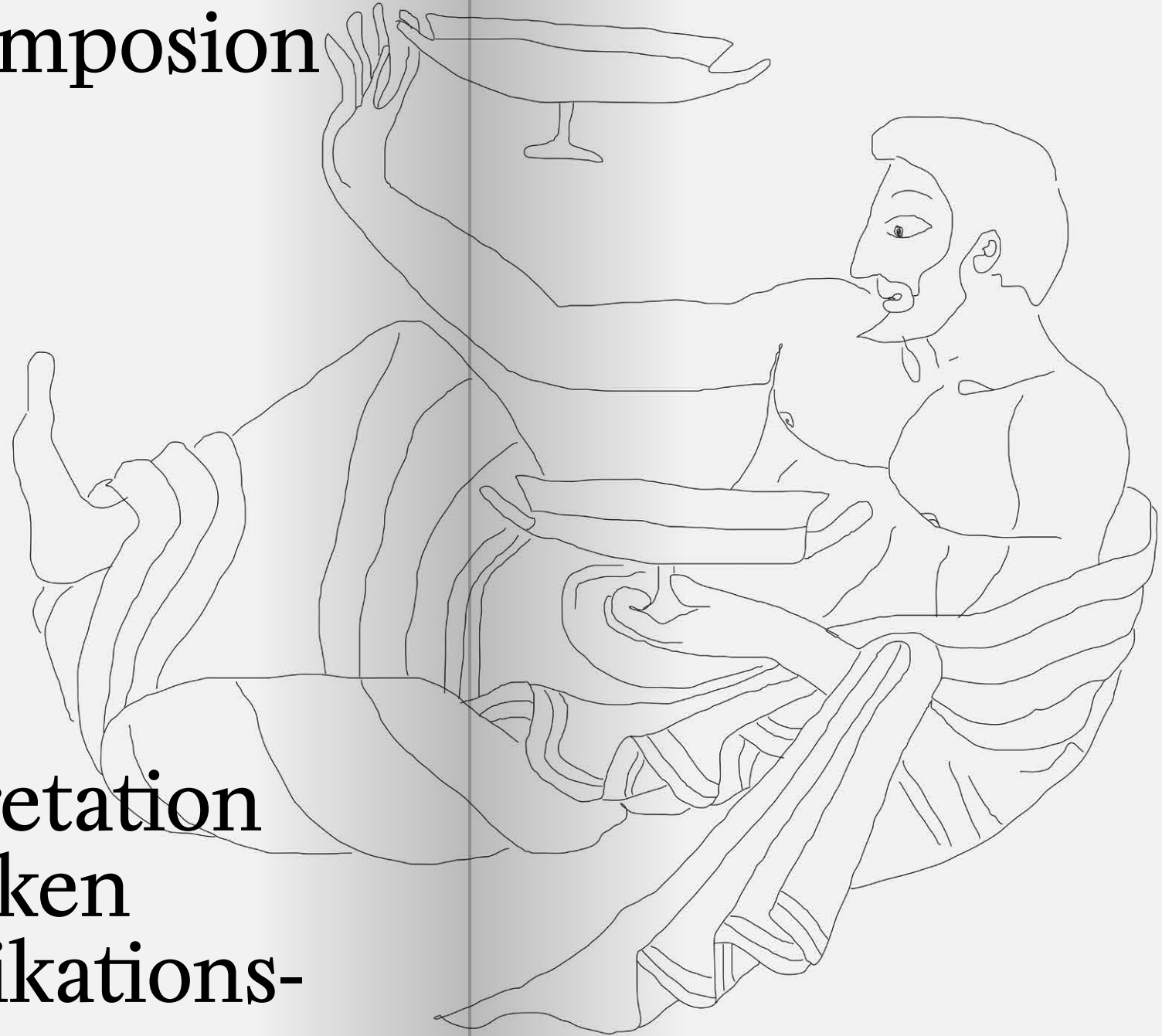
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Sie studierte  
Visuelle

Kommunikation an der  
Bauhaus-Universität  
Weimar und der York University  
Toronto. Ihren Master in  
Textil- und Flächen-Design  
absolvierte sie an der  
weißensee kunsthochschule  
berlin, wo sie derzeit als  
Meisterschülerin studiert. Ihre  
Arbeiten bewegen sich  
undogmatisch zwischen Textil  
und Grafik und stellen die  
menschliche Interaktion  
durch Objekte in den  
Vordergrund.

MARLEEN CLARA  
BAUER

# Symposion



Textile  
Reinterpretation  
eines antiken  
Kommunikations-  
formats



Der antike Ursprung des heutigen Symposiums könnte paradoxer kaum sein. Das Symposium, das ursprünglich eine gesellige Zusammenkunft für philosophische Gespräche war, ist fachspezifischen Vorträgen in geordneten Stuhlreihen und formalisierten digitalen Begegnungen gewichen. Gleichzeitig hat sich die Wertschätzung des gemeinsamen „In-einem-Raum-Seins“, durch die Pandemie beschleunigt, stark verändert.

Heute spielen digitale Werkzeuge eine zentrale Rolle. Sie haben unsere Verständigung maßgeblich verändert – und erweitert. Die unmittelbaren Beziehungsebenen, Emotionen, Gestik und Mimik gehen dabei in ihrer bekannten Form nahezu vollständig verloren. Darüber hinaus reduziert sich der soziale Radius alltäglicher Tätigkeiten. Nicht nur nutzen wir unsere Rechengeräte für die Arbeit und die Unterhaltung am Abend – ein Großteil der sozialen Interaktionen im Beruf verlagert sich auch in den virtuellen Raum.



1 Eickhoff, Hajo:  
*Sitzen. Eine Betrachtung der bestuhnten Gesellschaft*, Frankfurt am Main 1997, S. 22.

2 Ebd., S. 128.

3 Brunner, Bernd:  
*Die Kunst des Liegens: Handbuch der horizontalen Lebensform*, Köln 2012, S. 65.

Das Sitzen vor den technischen Geräten wird zum Ausdruck steigender Organisation und Disziplinierung. Die Sitzhaltung, scheinbar prädestiniert für konzentrierte schöpferische Arbeit, etabliert sich im Alltäglichen.<sup>1</sup> In der eingeübten sitzenden Haltung lernen wir, strukturiert zu arbeiten und zu denken. Das Maß der Disziplinierung lässt sich im Rahmen von Bildungseinrichtungen beobachten. Kinder müssen still sitzen – wer das nicht tut, ist unerzogen. Das wilde, freie Denken findet bei Spaziergängen, im Urlaub, oder bei anderen Aktivitäten statt. Das starre Sitzen und das konzentrierte Arbeiten haben Folgen wie „Ermüdung und Kopfschmerzen, Erschöpfung, Sehnschmerzen und zahlreiche Rückenleiden (...)“.<sup>2</sup> Bernd Brunner beschreibt hingegen in seinem Werk *Die Kunst des Liegens – Handbuch der horizontalen Lebensform* das Arbeiten in der Horizontalen diverser Geistesgrößen.<sup>3</sup> Demnach bewirkt das Liegen nicht nur die bloße Regeneration der Muskeln,

4 Brunner,  
*Die Kunst des  
Liegens*, S. 8.

5 Wellhöfer,  
Peter R.:  
*Gruppen-  
dynamik und  
soziales Lernen*,  
München 2018,  
S. 21.

sondern wirkt auch befreiend, anregend und zudem arbeitsfördernd. Es ermöglicht eine alternative Perspektive und Wahrnehmung des eigenen Körpers und der eigenen Person und damit das Aufbrechen gesetzter Gedankenzüge und Gewissheiten.<sup>4</sup>

Jedes Individuum wird geprägt von der eigenen Wahrnehmung, aber auch dem Außen – dem öffentlichen und privaten Raum, Objekten, Tätigkeiten und insbesondere von anderen Individuen. Hierbei nehmen wir bestimmte Rollen an, die auf kultureller Prägung basieren und von Machtstrukturen durchzogen sind. Gerade deshalb können im Austausch mit anderen Prozesse in Gang gesetzt werden und Veränderungen beginnen. Man spricht von „sozialer Erleichterung“. Gruppenentwicklung entsteht, wenn „die potenziellen Gruppenmitglieder [...] die Möglichkeit haben, miteinander in Beziehung zu treten und zu kommunizieren.“<sup>5</sup> Doch wie können diese räumlichen Situationen gestaltet sein? Welche Elemente können soziale Hierarchien mindern, einen Austausch fördern?



Die interdisziplinäre künstlerische (Forschungs-)Arbeit *Symposion*, bestehend aus Textilien (Marleen Clara Bauer) und Gefäßen (Henriette Neumeyer), verknüpft die klassische Wissenschaftsveranstaltung mit Elementen des experimentellen Happenings. Anpassbare Textilien fordern als Wearables – am Körper tragbare Technologien – einen fluiden Wechsel der Körperpositionen zwischen Liegen und Sitzen heraus. Unterfüttert wird der Dialog – ähnlich wie im klassischen Symposion der Antike – mit Getränken und kleinen Speisen. Die über Stunden praktizierte Liege-/Sitzposition im *Symposion* verlangt nach einer Polsterung von *Sóma* (griech. Körper) und *Plevrá* (griech. Seite) der Teilnehmenden. Schlichte textile Polsterelemente, die unmittelbar von allen Eintretenden angelegt werden, agieren als erste Verbindung, als erste sichere Zone, die am Boden durch zusätzlich polsternde Untergründe erweitert wird. Teilnehmende setzen sich nebeneinander und gleichermaßen mit der neuen Situation auseinander. Sie lehnen sich zurück, legen sich hin.





Sie befinden sich in ihrer eigenen Zone, können diese aber auch mit den Zonen der anderen über das Textil hinweg verknüpfen. Das Textil bietet währenddessen die Möglichkeit, sich sowohl der sitzenden als auch der liegenden, und allen Positionen dazwischen, anzupassen.

Ohne starre Sitzreihen wird die Trennung von Vortragenden und Publikum aufgelöst und es entsteht eine neue, gemeinsam zu erfindende Intimität. Das von den Textilien initiierte Erforschen von Körperpositionen innerhalb der Gruppe erzeugt eine Atmosphäre ohne Hierarchien. Welches Wissen wird hier verhandelt, geteilt und ausgetauscht? Welche Gespräche werden geführt, welche Begegnungen finden statt, die üblicherweise von Stuhlreihen verhindert werden? Das *Symposium* beginnt...

Konzeption

Kommunikationsformat

*Symposium:*

Henrieke Neumeyer &

Marleen Clara Bauer

Gefäße: Henrieke Neumeyer

Textilien: Marleen Clara Bauer

Betreut von:

Prof. Dr. Zane Berzina,

Prof. Barbara Schmidt,

Prof. Dr. Jörg Petruschat

weißensee kunsthochschule berlin, 2022

