SCALES
IN TEXTILES

2025

ArcInTex
Beyond e-Textiles
Aalto University

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AALTO UNIVERSITY

APRIL 8-10, 2025

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ISBN 978-952-64-9668-9 (PDF)

http://urn.fi/URN:ISBN:978-952-64-9668-9

Unigrafia Oy
Helsinki
2025

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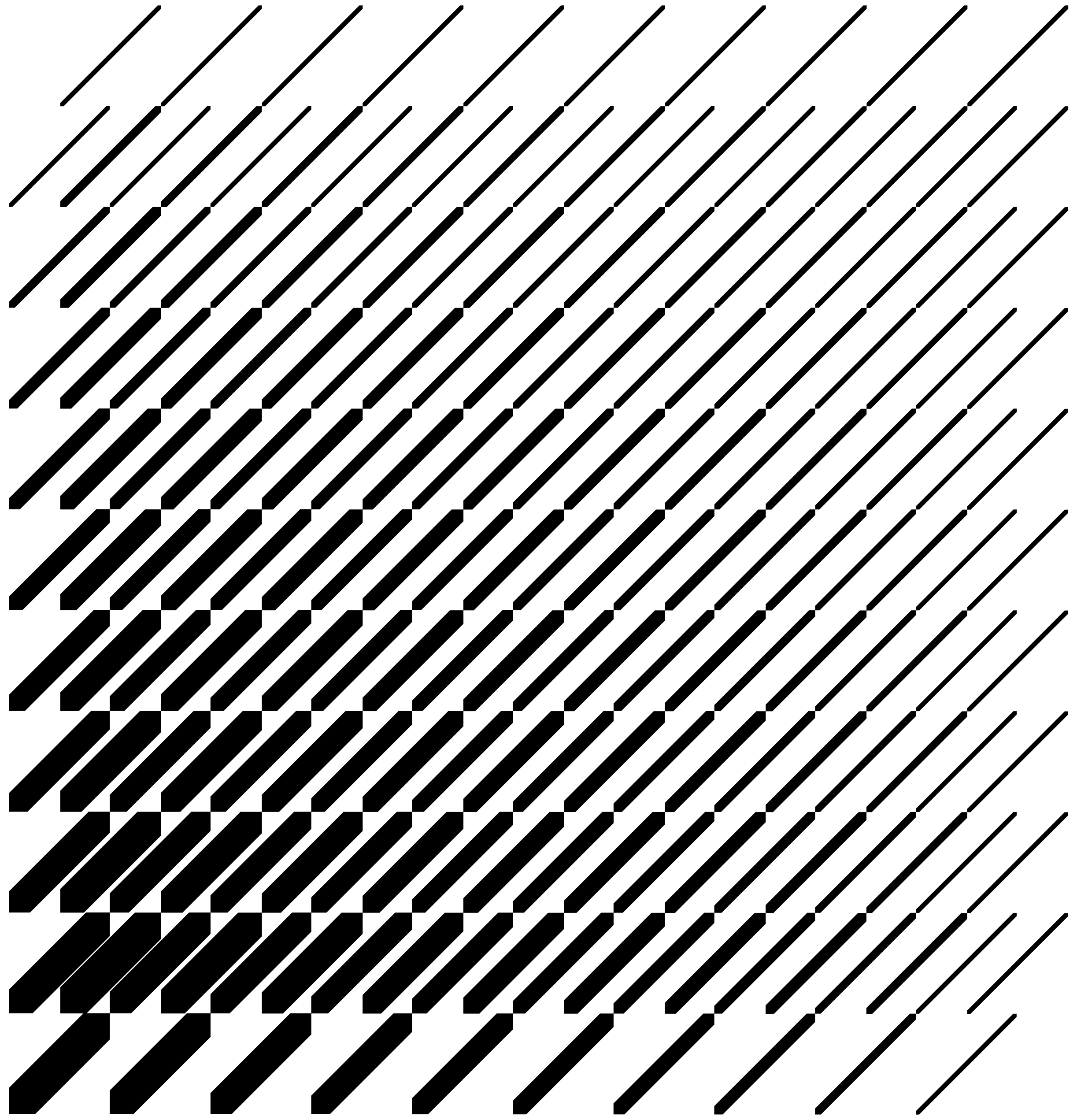

SCALES IN TEXTILES

The conference is hosted by Aalto University, bringing together the ArcInTex network and the Beyond e-Textiles project. This conference explores the multiple scales inherent in textile innovation - whether through physical scales, from nanomaterial manipulation and fiber development to the integration of textiles into wearable technologies and extensive IoT systems, or through temporal scales, as we rethink material life cycles and longevity. It also challenges us to reflect on the balance within our research choices: how we weigh and prioritize competing needs, and how we bring together perspectives that range from the generalisable to the deeply personal.

ArcInTex

ArcInTex is a network where Architecture, Interaction Design and Textiles join forces in developing ideas, techniques, methods and programs for new perspectives on design for building, dwelling and living and do so through joint research projects, joint applications for funding larger projects, exchange programs on the Master and research levels, and joint conferences and workshop on emergent topics.

Beyond e-Textiles

Beyond e-Textiles is a Nordic network on smart light-conversion textiles beyond electric circuits. The project aims to unlock the full commercial potential of smart textiles by opening up ways for light-powered textiles that can find uses, for instance, as sunshine-based dry cleaning or disinfecting of clothes, UV-powered water purification nets, light-collecting tents, and incident irradiation adaptable window shades/curtains. Overall, our goal is to bring together critical mass and to form a network to serve particularly Nordic industries that could benefit from progress in smart textiles. Moreover, we aim to enhance Nordic integrity in exchanging the best practices of teaching design thinking, as well as facilitating interdisciplinary collaboration between scientists, engineers, designers and artists.

BEYOND E-TEXTILES: RELATING RESEARCH METHODOLOGIES IN RESPONSIVE TEXTILE DESIGN

DELIA DUMITRESCU

University of Borås

Delia Dumitrescu is Professor of Textile Design at The Swedish School of Textiles, University of Borås. She is head of the Smart Textiles Design Lab, part of the Science Park Borås. Central to Delia's research is the topic of material and textile design, focusing on the development of new materials that expand from smart and computational textiles to biodesign and biofabrication. Through the notion of textile design thinking, her research expands the textile methodology; it includes systematic research work with colour, materials, textures, structures, patterns, and function to explore and propose new design futures for sustainable living from material to body to spatial design.

The paradigm of smart textiles has shifted beyond electronics and computational technology. The awareness for preserving the natural environment through the gentle imprint of raw materials, reduced energy consumption, and applied principles of design ethics asks for the search for alternative relations between humans and the designed materiality. Subsequently, "designerly" care for the natural environment opens new research trajectories for material design and innovation questioning established hierarchies between humans and more-than-human subjects and objects. In this context, research methodologies have become more comprehensive; they are open to cross- and trans-disciplinary methodologies and move objective knowledge to situated research.

In the Beyond E-Textiles project, we conducted cross-disciplinary research by developing a new textile materiality by adopting a holistic approach of the material where science, textile design and speculative art met. In this research we were inspired by the changing behaviour of natural organisms, and through diverse methodologies we designed and questioned the properties of responsive raw materials, e.g, shape-, colour-, changing, self-cleaning, and light-emitting responsive yarns, and reflected on their agency in the design process. Moreover, we observed the textile responsiveness and relationality to other systems, for example, natural phenomena, the environment, and living organisms. In Beyond E-Textiles, the examples of materials and artefacts present diverse properties and capacities of a vibrant materiality; they engage developments from bottom-up processes starting with experimental research to material science and engineering, to textile craftsmanship, technology and design. To gain a deep understanding of the responsive capacities and design qualities emerging from these materials, we expanded the experimental practice by introducing the first-person perspective through acts of use and interaction design methodologies. Subsequently, the reaction and interaction to environmental phenomena such as natural light with its UV wavelengths complemented the agency of the designed materials and their acts of use by introducing the agency of the natural environment as a co-designer of change. A non-hierarchical experimental system of materials, methods and tools lies in the background of this research as foundation for this textile development. As a result, the richness of the material library developed in this project represents an entanglement of diverse disciplines and demonstrates various characters of a relational textile materiality. The textile samples and artefacts presented in the exhibition illustrate and speculate on future scenarios of a smart textiles way of living starting from advanced material developments for new responsive yarns and textile coatings, textile techniques in manual and machine processes, design methods for novel textile structures, and construction techniques for knitting and weaving, thereby illustrating an emerging relational textile aesthetics.