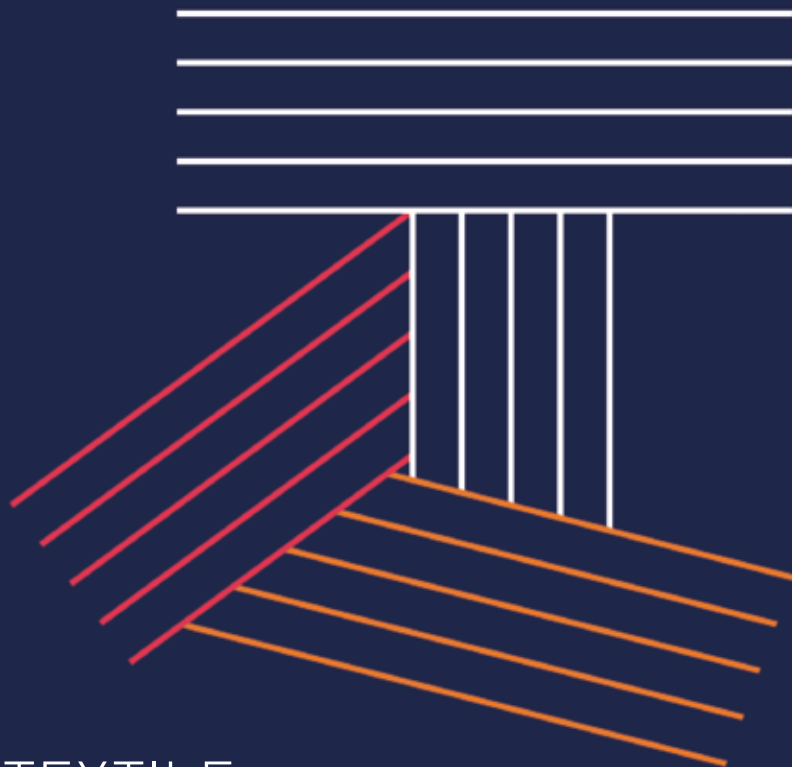


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TEXTILE INTERSECTIONS EXHIBITION

Collaborations in Textile Design Research
London 20-23 September 2023



The 3rd edition of the TEXTILE INTERSECTIONS conference explores and celebrates the nature of collaborations in textile design research through six themes: Textiles and Architecture, Textiles and Sports, Biotextiles and Sustainable Textiles, Interactive and Performative Textiles, Advanced Textiles Materials and Processes, Critical Textiles.

The exhibition is held at Loughborough University London 20–23 September 2023, and organised by the Textile Design Research Group at Loughborough University in collaboration with Royal College of Art, London, UK, the Swedish School of Textiles University of Borås, Sweden, and Elisava, Barcelona, Spain.

The exhibition is curated by: Hanna Landin, Bruna Petreca and Riikka Townsend.

All images by authors unless otherwise noted.

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Weaving Landscapes - Near-sourcing weeds for developing cellulosic fibers and textiles

Biotextiles and Sustainable Textiles, Critical Textiles

Weaving Landscapes illustrates a dialogue between land, material science and textile craft for developing sustainable textile pieces. The quest in this research is to examine the role of materials and landscapes as co-participants that can influence the shift in perception of textile qualities, aesthetic engagement and making processes by investigating alternative textile materials. It critically questions the cultivation and production practices of current textile materials and their impacts on the environment. In this research we look at alternative textile materials that can be derived from plants that are considered as weeds in our surrounding. The first case study for the research is focused on *Lupinus polyphyllus* commonly known as Lupine. The project is an interdisciplinary collaboration between School of Chemical Engineering and School of Arts, Design and Architecture at Aalto University. The collaborative project between material science, textile craft and design, studies methods for separating Lupine fibres from stems to produce fine yarns for weaving and knitting. The method for extracting the fibres further focuses on retaining the intrinsic properties of the fibres and yarns to absorb moisture and deform its shape. Through a hierarchical study of fibres, yarns and textile structures the environmental responsiveness of the fibres are further explored to build sculptural textiles that can change shapes with fluctuations in relative humidity. The ongoing research sets forward a new paradigm for reimagining the role of landscape, textile and craft practices along with material science for creating sustainable textile futures.

Maija Vaara – Doctoral Candidate, Aalto University School of Chemical Engineering. Research Focus: combining traditional craft techniques with the new alternative materials and processes. **Laura Koskelo** – Pursuing MSc in Aalto University School of Chemical Engineering. Research Focus: Extracting fibres from different weeds with the use of green chemicals. **Mithila Mohan** – Doctoral Candidate, Aalto University School of Arts, Design and Architecture Research Focus: Alternative textile materials. Developing kinetic, shape changing woven fabrics that respond to environmental stimuli, and play a functional role outside of the traditional textile realm. **Jaana Vapaavuori** – Assistant Professor, Aalto University School of Chemical Engineering. Research focus: Sustainable bio-based material alternatives, stimuli-responsive shape-changing textiles.



Filamentous Future: Mycelium as a leather-like material

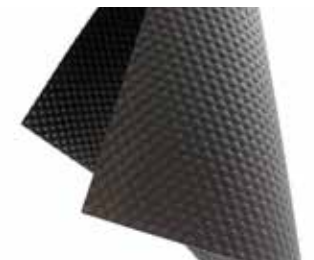
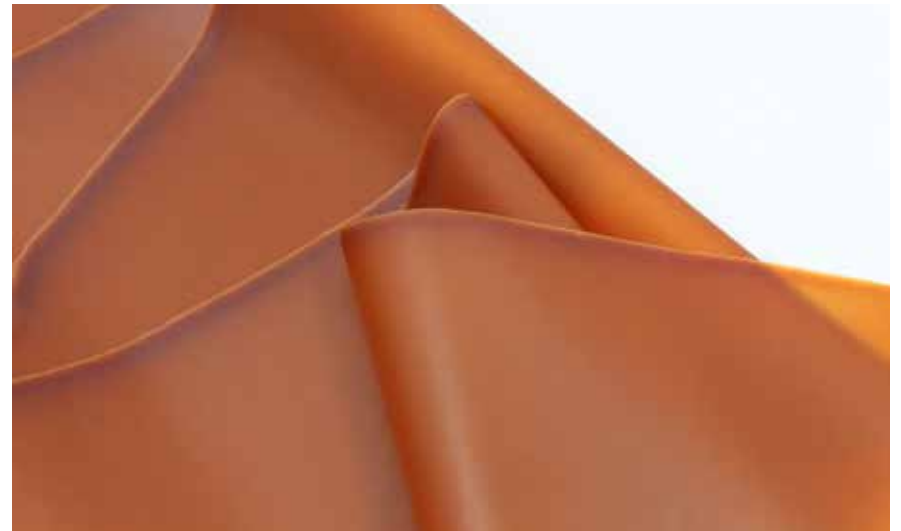
Biotextiles and Sustainable Textiles

Leather-like materials from fungal mycelium are an emerging class of ethically and environmentally responsible fabrics. These bio-based fabrics have gained popularity in recent years as an alternative material to animal and synthetic leathers.

This work illustrates a continuous production method for making leather-like materials using submerged liquid fermentation. While traditional leather and its alternatives are sourced from animals and synthetic polymers, these renewable and sustainable mycelium-based materials can be produced by utilizing low-cost agricultural and forestry by-products and biological fungal growth processes. This research is being developed at VTT Technical Research Centre of Finland and it is part of my ongoing research as a doctoral candidate from Aalto University at VTT.

As a designer with formal studies in sustainability, this work highlights the future role of designers in interdisciplinary material research to set a context for scientific research and make visible the importance of aesthetics along with technical properties as a material transitions from research to product development. Through my ongoing collaboration with material scientists, microbiologists, and chemists, my role has been to speculate future applications and to create prototypes as well as deploy design know-how and craftsmanship in the making of these materials.

Manuel Arias Barrantes – Aalto University + VTT Technical Research Centre of Finland. I am a designer and creative researcher working between the disciplines of design and science, technology, and craft. Inspired by the notions of sustainability and new digital and biological tools, I started my doctoral studies in biotechnology to study how these technologies could be employed to design the next generation of self-repairing materials utilizing microbes such as fungi, algae, and bacteria. My initial encounters with biology began with my Master's thesis where I explored mycelium as a leather-like material. This work resulted in an experimental approach to material design and set the foundation for working towards methodologies to guide the designers' work with scientists and explore the role of design in scientific environments when creating new biological materialities.



Interwoven Sound Spaces

Interactive and Performative Textiles

Interwoven Sound Spaces is an interdisciplinary artistic project which brought together researchers from fields including textile and garment design, wearable computing, sound engineering and telematic technologies. The project culminated in a telematic concert in December 2022 with two ensembles in two concert halls in Berlin, Germany and Piteå, Sweden, performing works by four contemporary composers. Wearable garments worn by the musicians in each location generated data from their movements which was fed back into the network, impacting how the music was heard in each of the concert halls. Wearable, sound and telematic technologies were designed with a common concept of creating a shared stage for musicians, bridging the geographic divide and allowing for musical interaction.

In the context of Textile Intersections 2023, the authors are exhibiting the process and results for one wearable design, worn by a cellist, a percussionist and a violist. Inspired by mutable connections within the network, the "tensile" wearable spans the distance between a musician's shoulder, elbow and finger, with integrated knitted sensors tracking differences in tension between these points. In a process guided by embodied design and soft textile solutions, the authors present a wearable that is both versatile and customisable, allowing for a diverse array of interactions between musicians, their instruments, and the network.

Codi Körner – (wearable designer) is a fashion designer and researcher exploring interfaces between digital and physical materialities. Their freelance work spans 3D digital fashion, jewellery design, textile installations and garment research for wearable technologies. **Emma Wood** – (e-textile designer) is a weaver and artistic researcher at Berlin University of the Arts. Her work focuses on experimental material development, specialising in the intersection of heritage hand-weaving techniques, technology and textile engineering. **Berit Greinke** – (Co-PI) is a professor in Wearable Computing at Berlin University of the Arts and Einstein Center Digital Future. Her research focuses on engineering design methods and fabrication techniques for electronic textiles, combining crafts with novel manufacturing technologies. **Federico Visi** – (Co-PI) is a post-doctoral researcher at Berlin University of the Arts and Einstein Center Digital Future. His research interests include gesture in music, motion-sensing technologies, interactive machine learning, and embodied interaction.



Growing Patterns. Living Pigments

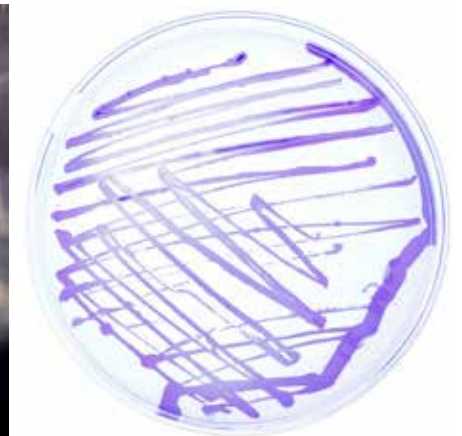
Biotextiles and Sustainable Textiles

Nature knows how to produce colours without chemicals and harmful ingredients. Inspired by that „Growing Patterns. Living Pigments“ is exploring the possibilities of interspecies creation through involving pigment producing bacteria in dyeing textiles. Using bacteria as a colour source for dyeing textiles brings a lot of advantages. Bacteria only need a few hours to few days to grow, small space, little nutrition, almost no water and no harmful chemicals. Bacteria dyes are thus a highly sustainable alternative for both chemical as well as plant dyes. Positioned in the field of art [design] & science this work investigates on how to navigate living bacteria to overgrow fabrics, leaving their pigments for colouring them and creating intentional pattern designs with it. Within this practice-based research bacterial dyeing is combined with diverse textile and digital fabrication technologies towards identifying innovative solutions for intentional textile pattern design creations. Employed techniques are 3D-printing, laser engraving & cutting, jacquard weaving, UV-printing, wax and plate pressing techniques etc. In a series of bacteria dyed batches, that show the samples before and after the dyeing process, innovative aesthetical perspectives for the application of bacteria in dyeing textiles are presented. While bacterial pigments so far have been used mostly for homogeniously or randomly dyeing textiles (in the way the bacteria decided to move over the fabrics), this project presents aesthetic solutions for guiding the bacteria into the creation of intentional forms and shapes.

Julia Moser – Crafting Future Lab, University of Arts Linz, sees her mission in re-thinking fashion and textile design practices and production processes towards a more sustainable and healthy future. With a focus on material innovation and bio design, she uses new technologies to find alternative ways of thinking design and design processes. With a background in textile.art.design and Fashion&Technology, she is currently working at the Crafting Futures Lab at the University of Arts Linz. Her art and design work has been exhibited from Europe to Israel, Oman and Japan and will soon be on view in Canada and at the V&A London.

Vienna Textile Lab, startup, fabricates organic colours made from naturally occurring bacteria in order to provide the most sustainable, wholesome and environmentally friendly alternative to conventional synthetic colours. The Vienna Textile Lab helps designers use novel materials, methods and concepts to find responsible and thoughtful ways to work in the textile industry.

Credit: Anna Rosa Krau



Cellulose interactions

Biotextiles and Sustainable Textiles, Interactive and Performative Textiles, Advanced Textiles Materials and Processes

The following work presents biodegradable and biocompatible interactive textile pieces made out of cellulose-based materials.

Smart textiles materials capable of sensing, reacting, and adapting to environmental stimuli have shown great potential in the fields of performance, healthcare and interaction design. Nevertheless, combinations of electronic components with complex textiles structures are commonly used to create them, raising questions about their life cycle and sustainability. To approach it, waste preventive eco-design guidelines have been proposed, including reducing the diversity of materials in a product, reducing the weight, and prioritising using renewable and recycled materials. Focusing on the last one, bio-based eTextiles could create new alternatives to the industry, where adaptive, biocompatible, and biodegradable materials could replace metals and plastics.

This exhibition presents novel manners of manipulating a cellulose-based material, i.e. Carboxymethyl cellulose (CMC), in combination with novel bio-based conductive yarns to create touch-sensing woven pieces. The woven samples will explore CMC's functional and aesthetic properties, combining natural dyes with different woven structures to create an array of interactive gestures to trigger sounds. One piece will be placed in water to portray its degradability and dismantling as the exhibition occurs, showcasing its life cycle.

The work results from a collaborative effort by Sofia Guridi from Design and Matteo Iannacchero from Chemical Engineering as part of the Bioinnovation Center at Aalto University. The presented pieces are a continuation of previous work done by Sofia Guridi.

Sofia Guridi – Design researcher working in the intersection of textiles, electronics and biomaterials for creating interactive surfaces. Combining traditional knowledge with material experimentation, her experience ranges from applied research to artistic installations. She is currently part of the Fashion/Textiles Futures research group and the Bioinnovation Center at Aalto University, where she is pursuing her PhD in Sustainable Smart Textiles. **Matteo Iannacchero** – With a background in industrial chemistry and biomaterials, he is pursuing his PhD in chemical engineering in a collaboration founded by Bioinnovation Center between Multifunctional Material Design and Computational Electronic Structure Theory research groups at Aalto University. The aim of his research is to combine laboratory work and machine learning to create optimal bio-based materials that can replace metals and plastics in e-textiles pieces.



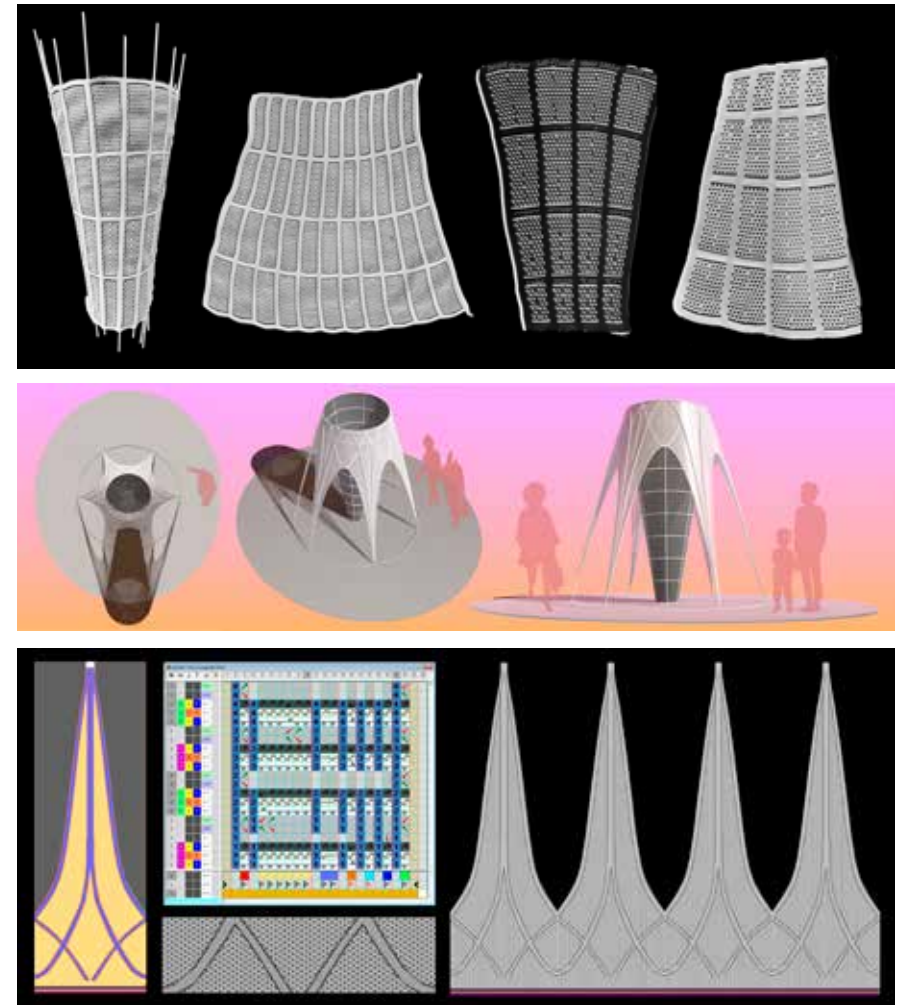
ELSA - Elastic Lateral Surface Assembly

Textiles and Architecture

ELSA pavilion is a prototype for a hybrid, form-active textile assembly constructed of two nested and inverted deployable conical geometries. The self-stabilized structure is developed as a layered surface enclosure designed to support future 'living' wall (soft farming) systems. ELSA expands upon cross disciplinary research by the authors and team collaborators employing glass fiber reinforced polymer (GFRP) rods and CNC knitted textile construction. The proposed structural approach draws from fashion techniques and dressmaking typologies including farthingales, cage skirts, corseting, and boning methodologies. The pavilion's compliant structural capabilities and atmospheric effects are exploited through the curation of GFRP rod and structural knit patterning. Textile tectonics include shaped tubular knits, flexible lattices, and structural pointelle mesh. Future architectural applications include emergency enclosures, temporary settlements, and flexible surface adaptations.

Linda Ohrn-McDaniel is a Professor in the School of Fashion at Kent State University. Her research focus is on intersections of knit applications in a range of collaborative projects such as architectural pavilions and medical solutions along with fashion projects. **Diane Davis-Sikora** is a Professor in the College of Architecture and Environmental Design at Kent State University. She is a licensed architect whose research focuses on temporary, kinetic structures that employ variable patterns and surfaces. She has also produced films on narrative and documentary storytelling in architecture.

Linda and Diane have worked together over the past 6 years looking at ways to explore opportunities for textiles in the evolution of lightweight structures.



Modular Knitted Architecture: Column

Textiles and Architecture, Biotextiles and Sustainable Textiles

Modular Knitted Architecture: Column investigates form generation through collaborative, interdisciplinary digital/physical practice for novel architectural formwork design.

The use of knit in the production of architectural formwork offers two solutions to the negative environmental impact of the construction industry. Firstly, the 3D shaping capability of knitted fabric provides a zero-waste production method for complex form. Additionally, knit can be produced using regenerative fibres and low-impact bio-materials.

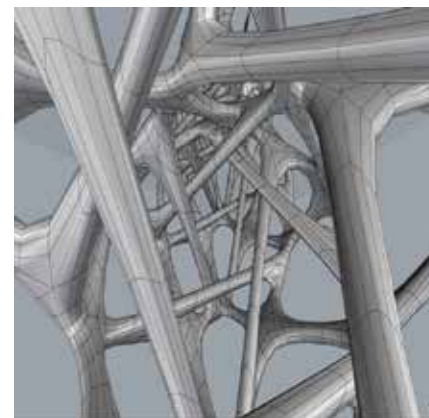
Branching topologies were produced in hand-knit, using knit-thinking which uses a knit designer's technical and tacit knowledge in a thinking-through-making methodology to produce prototype 3D knitted modules.

Development of the knitted modular column moved between the material practice of hand knitting and digital modelling using a bespoke Grasshopper design system. The digital modelling system introduced sliding variables to control quantities, dimensions and variance of knitted modules which were combined to reveal a lexicon of complex 3D geometries.

Production of knitted modules at a 1:1 architectural scale would require digital knit production of individual modules joined through seaming. Conventional commercial seaming technologies affect the material properties of the knitted fabric at the join which adds complexity to the digital modelling process. This work explored joins using the craft practice of grafting, which replicates knit structure and maintains fabric properties throughout, enabling accurate digital modelling.

The interdisciplinary design approach moved fluidly between a physical and digital design environment where the development of each practice was informed and informed by an understanding of the other to allow innovative and versatile development of experimental forms in architectural research.

Elizabeth Gaston is an assistant professor at Northumbria University Design School. Her research uses knit thinking to explore complex problems with a focus on responsible design. Recent projects focus on the use of knit skills in architectural practice and improving the environmental effects of textile colouration through experimental colour use. **Jane Scott** is a Newcastle University Academic Track Fellow (NUAcT) who leads the Living Textiles Research Group in the Hub for Biotechnology in the Built Environment. Her research is located at the intersection of textiles, architecture and biology; exploring the potential to design with biology using textile fabrication processes. **Armand Agraviador** is an independent researcher. His research investigates the architectural potential of integrating novel biomaterial technologies into the built environment. He specialises in building information modelling and computational design and has utilised his skills to incorporate biological concepts to structure and façade working at multiple scales.



Entangled - Reimagining Textile Functionalities, Aesthetics and Sustainability

Advanced Textiles Materials and Processes

In the presented collection of artefacts, textiles are seen as active elements in their environments – being able to react to environmental stimuli by changing their shape, colour, or other qualities. Drawing parallelism to biological materials, some of these changes are two-directional and thus can lead to reversible changes, whereas some are linear and irreversible, such as ageing. As examples of two-directional changes, textile designs based on UV reactive properties: colour changing, light emitting, and self-cleaning, as well as textile constructions based on newly developed yarns capable of reversible shape changes upon exposure to heat are exhibited. On the other hand, the colour changes of natural dyes dictated by the ambient environment and the heat-response of new PLA yarns bring about elements of irreversible change. When two-directional and linear changes coexist, the appearance (and thus aesthetics) of the artefacts is constantly altering. The timescales contained in these textile transformations vary significantly creating an interesting interplay of diverse and sometimes intersecting qualities. These concepts are approached from different viewpoints – from developing new advanced materials for making yarns, exploring different textile crafting methods for producing diverse textile structures, and to engaging with aesthetic sustainability.

This exhibition bases on interdisciplinary research work involving contributions from physics, crafting, materials engineering, and textile design. Partners are Aalto University, University of Turku, University of Borås, VIA University College, and Iceland University of the Arts. Employing methodologies from these various disciplines and conducting research at different levels of hierarchy of textile construction can help us to reimagine, materialise and finally realise new textile concepts and their changing aesthetics.

UNIVERSITY OF BORÅS

Delia Dumitrescu – Professor, Vice-Chair of the Artistic Res. and Educ. Board Faculty of Textiles, Engineering and Business (including the Swedish School of Textiles) Department of Design. **Riikka Talman** – Postdoctoral Researcher Faculty of Textiles, Engineering and Business (including the Swedish School of Textiles) Department of Design.

VIA UNIVERSITY COLLEGE

Anne Louise Bang – Senior Associate Professor in Design & Sustainability, PhD Affiliated to Center for Creative Industries & Professions – VIA University College. **Malene Harsaae** – Associate Professor, PhD, Age in relation to clothing, long shelf life, circularity in fashion Affiliated to Center for Creative Industries & Professions – VIA University College. **Inger Marie Ladekarl** – Associate Professor, Bio-based textile printing and colouring (analogue and digital) Affiliated to VIA Design & Business. **Lena Kramer Pedersen** – Associate Professor Textile Design, digital and analogue knitting and weaving processing. Affiliated

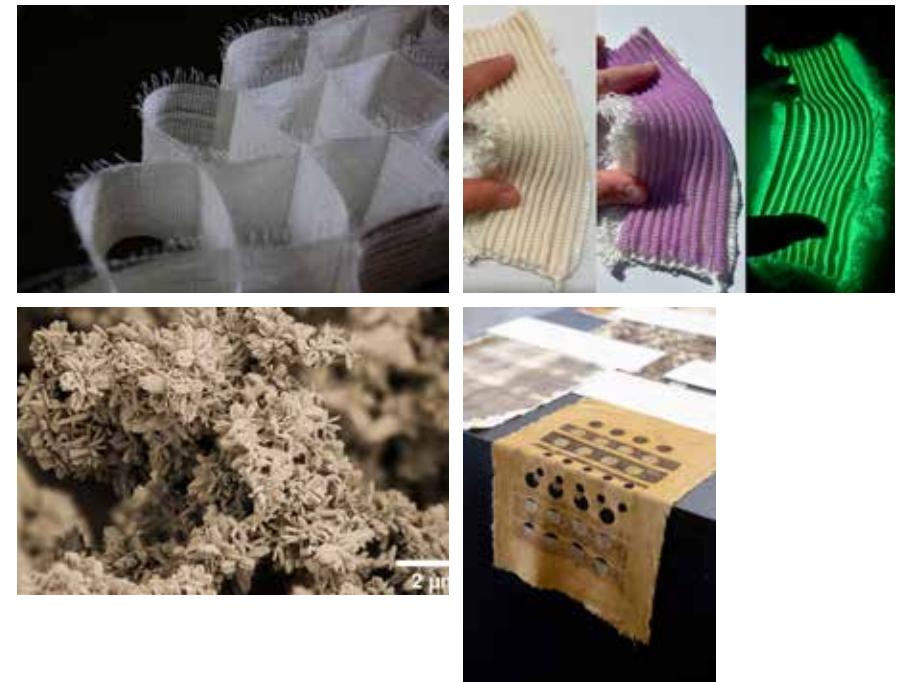
to VIA Design & Business. **Tina Bull Nielsen** – Associate Professor, Sustainable textiles, product development and circular systems in fashion. Affiliated to Center for Creative Industries & Professions – VIA University College. **Amalie Ege** – Research Assistant Affiliated to Center for Creative Industries & Professions – VIA University College.

UNIVERSITY OF TURKU

Alicja Lawrynowicz – Doctoral Candidate, Materials Engineering. **Kati Miettunen** – Professor, Materials Engineering. **Mikael Nyberg** – Laboratory Engineer, Materials Engineering. **Rustem Nizamov** – Doctoral Researcher, Materials Engineering.

AALTO UNIVERSITY

Jaana Vapaavuori – Assistant Professor, Group Leader – Multifunctional Materials Design Aalto University School of Chemical Engineering. **Laura Koskelo** – MSc, Multifunctional Materials Design, Aalto University School of Chemical Engineering. **Maija Vaara** – Doctoral Candidate, Multifunctional Materials Design, Aalto University School of Chemical Engineering. **Mithila Mohan** – Doctoral Candidate, Multifunctional Materials Design and Fashion Textile Futures. Aalto University School of Arts, Design and Architecture. **Pedro Silva** – Postdoctoral Researcher, Multifunctional Materials Design, Aalto University School of Chemical Engineering. **Zahra Madani** – Doctoral Candidate, Multifunctional Materials Design Aalto University School of Chemical Engineering.



Kind Materials Research

Biotextiles and Sustainable Textiles

Kind Materials Research presents an investigation into alternatives to chemical dyeing and finishing, integrating bio-dyeing processes with laser technology. Interdisciplinary aspects of the work combined creative and technical aspects of textile design, bio-based dyeing, dye chemistry and digital fabrication.

The exhibition pieces include a linen textile sample collection, garment pattern pieces and a selection of material testing results that have been designed by combining a bio-dyeing process with laser treatments. Rethinking traditional textile coloration and patterning processes, the samples display the results of extensive testing to optimise alternate textile dye and patterning procedures, that adhere to sustainable and circular design strategies.

- Experimental bio-mordants to enhance the dyeing process of natural and plant-based dyestuffs included plant, fungi, and algae-based pre-treatments with advantageous properties as bio-accumulators, protein-binders, tannin-rich plant materials and natural nitrogen fixers. These ingredients omit chemical dyes, auxiliaries and harsh metal salts in the dyeing process that can be harmful to aquatic eco-systems and dye-house workers subject to continuous exposure.
- Textiles were dyed with natural dye extracts, using small scale commercial dye machines to show potential for industrial uptake of this process within the fashion system. All processes have been performance tested to commercial standards, suitable for mild laundering.
- The laser was used as a digital design process. Altering the intensity of laser irradiation resulted in subtle tonal differences, exploited creatively as a print process to add precision patterns to linen. As a dry treatment, combining design and pattern cutting in one step, showcases process viability for agile local production.

Laura Morgan & Rosy Heywood – Centre for Print Research, University of the West of England, Bristol.



Magnetic Reverberations

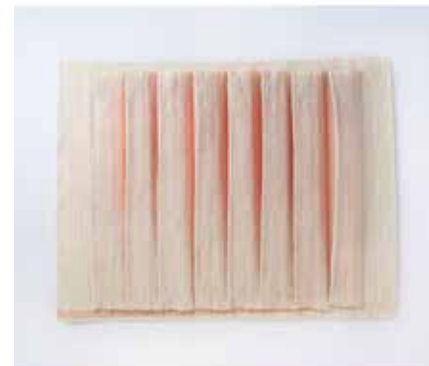
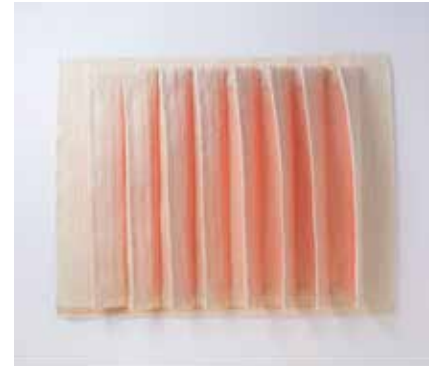
Interactive and Performative Textiles

By approaching programmable movement as a provocation, this project explored fabrics capable of oscillating between two states. Collectively, we used our knowledge of weaving, electronics, and programming woven drafts to generate a series of samples that fold, flap, and collapse before arriving at a vision for an interactive textile component. The prompt: reimagine Posch and Kurbak's 1-bit embroidered controllers within the vernacular of woven structure. The result, an e-textile woven in a single piece that, when removed from the loom, can be cut apart into distinct flaps. When connected to a controller via a custom interface we built to control its motion, the cloth performs gestures that lead to fabric behaviors like rustling, flickering and slow rhythmic opening and closing, suggesting a passage of wind or sunlight across the piece bringing it to life.

Each flap is controlled by two electromagnetic coils. When a coil is powered and attracted to a magnet, the flap closes and the cloth appears white. When opened, light bounces from the flap's bright orange interior onto the base cloth, creating a warm neon glow - effectively changing the color of the fabric in a large-scale, structural manner. Through close collaboration and extensive prototyping, we developed weaving strategies in which disparate elements - neutral base, neon flaps, copper coils - are fully integrated into a single-piece fabric on the loom. Designing a woven fabric that not only contains actuators, but lends itself easily to actuation through zones of rigidity and softness, was an equally important part of this process, developing from conversations with engineers and designers in our lab. We centered diagramming and process documentation throughout our collaborative process, maintaining a record of "design bookkeeping" that led us through iterations in coil form-factor, neon color composition and weave structure, finally converging as a color-shifting, actuating woven fabric.

Elizabeth Meiklejohn is a textile designer and researcher focused on computational design, notation and fabrication of complex structures. **Laura Devendorf** is a designer, researcher and computer scientist creating custom hardware and software for interfacing with woven structures. **Irene Posch** explores the integration of technological development into the fields of art and craft, and vice versa, and social, cultural, technical and aesthetic implications thereof.

This project was completed during the Experimental Weaving Residency at the University of Colorado Boulder's Unstable Design Lab. The residency creates space for weavers to work with interdisciplinary collaborators, fostering a deeper understanding of weaving as a design methodology and entry point into creating technical, performative materials.



Radiant Textiles: Field topologies of woven textile structures

Advanced Textiles Materials and Processes

Radiant textiles is a type of smart textile that is regarded for its electromagnetic properties rather than its conductive properties (Lewis, 2023). The work is a series of 3D-printed objects that reveal the otherwise imperceptible magnetic field topologies of electromagnetic woven textile structures. The magnetic fields of waffle weave, honeycomb, and twill structures are presented as 20cm x 25cm x 6cm 3D-printed topological surfaces. The work reveals the intangible magnetic field shapes that have been abstracted from the tangible textile material. The objects are the result of a method called "magnetic textile scanning", which allows one to sense and make perceptible the magnetic field of textile structures. The emanations of the fields are captured through magnetometer readings that are repeated sequentially across the surface of the radiant textile. The measurement data is input into 3D design software to produce the visualizations and is then rendered for 3D printing.

The approach to the work combines interdisciplinary knowledge regarding the physics of electromagnetic textiles with textile design knowledge and practice. Smart textile design is inherently an interdisciplinary practice that requires a multidisciplinary team or, often in the case of individual practitioners and researchers, interdisciplinary knowledge that spans textile design, electronics design and engineering, programming, material science, and physics, among others. It is through this convergence of disciplines that the potential of electromagnetic textiles can be explored, thereby opening new domains for textile design and practice.

Erin Lewis, specializing in Textile Interaction Design from The Swedish School of Textiles, University of Borås. Her research explores artistic expressions of multisensory textile interactions using the electromagnetic domain of structural textiles. To do this, she designs sensing tools and methods that enable aesthetic expression of these hidden qualities and properties through textile interaction design practice.



No-Input Textiles

Interactive and Performative Textiles

No-input mixing is a musical practice wherein the signal from a mixing desk is fed back to itself so that it self-oscillates. The mixing desk, designed for utility and control, instead becomes an exquisitely sensitive musical instrument where the finest adjustments to knobs and faders can alter flow of sound in surprising ways.

With the No-Input Textiles, we explore the inherent affordances of textiles as flexible, playful, accessible, and otherwise versatile design material for soft interfaces for musical expression. While the texture and character of the material can be neglected in the instrumental use of textiles, we embrace the malleability and conversational quality of textile surfaces, and create a three-fold interaction between circuits, human touch, and soft fabric sheets.

Here, we present woollen experiments incorporating conductive knitted and woven structures into the circuit of a no-input mixer as two dimensional and squishy patch cables, softening the cold plastic of the mixing desk while drawing out the essence of the materials via sonic interaction.

Sophie Skach and **Victor Shepardson** come from different backgrounds, merging them in this installation. While Sophie is a trained fashion and textile designer (University of Arts London), and has specialised in e-textiles in her research (Queen Mary University of London), Victor is a computer scientist specialising in neural models and machine learning, and electronic musician (Dartmouth College). Currently he is pursuing his PhD at the Intelligent Instruments Lab, Iceland University of the Arts, where Sophie recently worked as a postdoctoral researcher, and where they started their collaborative textile musical explorations.



No Cuts No Seams

Advanced Textiles Materials and Processes

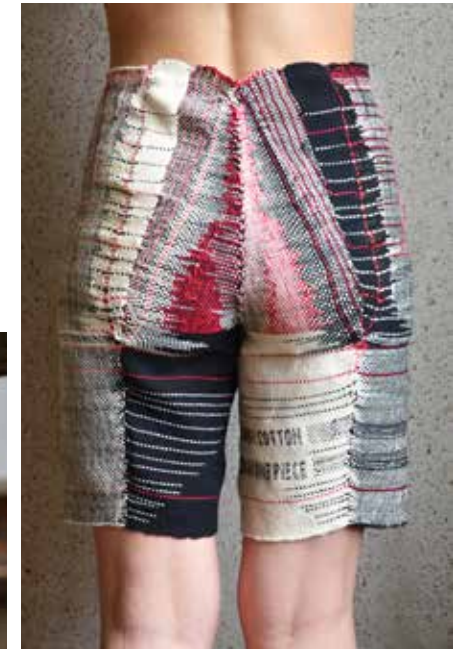
The two seamlessly woven prototypes exhibited by Juri-Apollo Drews are part of his ongoing practice-based PhD project called No Cuts No Seams. In this interdisciplinary research situated at the crossroads of textile design, fashion design and textile engineering, he creates woven garment prototypes that are entirely constructed on adapted hand looms without any cutting or sewing during or after the weaving process. To do so, he experimentally develops non-rectangular weaving techniques that allow for the production of rounded or slanted edges and seamless connections between woven and knitted textiles. The garments are zero-waste, thus providing a more sustainable alternative to the established cut-and-sew method, which generates 10-20% of pre-consumer waste.

The first prototype is a seamless pair of shorts including a knitted fastening mechanism developed by Italian industrial designer and researcher Ludovica Rosato. This makes the prototype 100% mono-material, thus presenting an advantage over conventional fasteners when mechanically recycling the garment at the end of its use phase. The prototype is therefore not only the result of an interdisciplinary design research cooperation taking into consideration current recycling technologies, but also introduces the innovative idea of hybridising weaving and knitting in one seamless garment.

The second prototype is a linen coat developed in 2020. Like the trousers, it is completely seamless and includes mono-material linen buttons.

Both garments' production processes have been documented by cameras installed above the loom that took pictures at regular intervals, which were combined into stop-motion videos illustrating the development of the garments on the loom.

Born in Berlin in 1991, **Juri-Apollo Drews** holds a BA in Arts & Culture from Maastricht University, a BA in Textile and Surface Design from weissensee kunsthochschule berlin and an MA in Textile and Material Design from École des Arts Décoratifs Paris. Since 2022, he pursues his practice-based PhD called No Cuts No Seams in the Soft Matters Research group at Ensadlab Paris, financed by SACRe/PSL University and co-supervised by Aurélie Mosse (Ensadlab), Claudia Mareis (HU Berlin) and Holly McQuillan (TU Delft).



Te Mara o Te Wairākau

Biotextiles and Sustainable Textiles, Critical Textiles

An interdisciplinary project designed to cultivate and grow public awareness of the effects of tree pathogens on Aotearoa New Zealand native forest.

Angela Kilford aims to raise the awareness of the effects of myrtle rust (caused by *Austropuccinia psidii*) by exploring the dichotomy between beauty and disease. Using the eco-print technique of steaming leaves in bundles of cloth, direct prints of myrtle tree leaves have been achieved. During meetings with the myrtle rust community Kilford learned of a particular Fungus Gnat that was laying its eggs on infected plants. Through participatory workshops held in the Wellington area participants were invited to embroider larvae and rust onto the eco-prints to encourage dialogue of both the disease and its wider ecosystem.

The participatory project then travelled to the Kaurilands Summit in Whangārei. The Kaurilands Summit is an annual event that connects researchers, mana whenua, community members, industry and government staff in the areas of kauri ora and myrtle ora. Discussion focused on the effects and mitigation of plant pathogens *Phytophthora agathidicida* (which causes kauri dieback) and *Austropuccinia psidii* (which causes myrtle rust). Attendees participated in the embroidery project during a dedicated session at the summit, which strengthened the dialogue between different community groups and produced many new insights into ways of working together, sharing information, creating dialogue, and engaging with public.

The third destination for the project will be a series of workshops at Te Uru Gallery, Waitakere, Auckland as part of a wider exhibition of works that were also commissioned by Toi Taiao Whakatairanga, supported by National Science BioHeritage/ Ngā Rākau Taketake Mobilising for Action programme.

Angela Kilford, Te Whanau A Kai, Ngāti Porou, Ngāti Kahungunu is an artist, designer, educator and researcher living in Te Whanganui A Tara. Her current research practice focuses on how mātauranga Māori and Māori participation can inform textile design practice and research to produce ways to benefit Māori communities and to sustain Papatūānuku. Alongside this, Angela's art practice explores the whakapapa of local ecology and the lesser-known connections between living and non-living entities. These ideas are examined and expressed through walking, performance, collaborative making, large scale public installations and writing. Angela is a Senior Lecturer and Major Coordinator for Textile Design at Massey University, Wellington.

Photo credit: Tanya Ruka



Photo credit: Sophie Jerram

Photo credit: Ariane Craig-Smith

Animate Materials: Exploring Nature-Inspired Dynamic Color Adaptation

Interactive and Performative Textiles

Through evolution, nature became a master of colour manipulation by creating unique structures that can interact with light purposely. Inspired by the footsteps of nature and through our technical ability in textile processing; we embarked on a collaboration between the two Universities and formed an interdisciplinary team of scientist, artist, and designers to transform the colouration of textiles. Textiles reveal and contextualize the most intimate relationship between material and humanity. The process of combining cutting-edge technological advancements and traditional textile making strikes a balance in the preservation of nature and the breakthrough in progressing human society. In this exhibition, we are showcasing not only the use of micromachining, self-assembly and surface engineering concepts to build colour in textiles (without any colourants), we will also offer functionality inspired by nature that will give the textiles the ability to respond to their environment. Inspired by the principle of colour-changing butterfly wings, we explored 3D printing hydroxypropyl cellulose (HPC) into pieces with pinholes of varying sizes and thicknesses. We experimented with different arrangements and connected them together with threads, simultaneously referencing the large-scale installation "Unwoven Light" by artist So Sunny Park. The sensory interaction is revealed on the textile surface, visualized by the thermochromic quality of the liquid crystals, extending the microstructure of colour into the macro level. Hence, the visuality of our project communicates the reciprocal relationship between art and science as an entity to a larger audience. In this exhibition, we will feature a textile-based installation demonstrating the techniques to textile led interventions for structural colour and a display documenting our colour-material archive.

Ahu Gumrah Dumanli-Parry bp-ICAM Kathleen Lonsdale Reserach Fellow, Lecturer University of Manchester, Department of Materials, **Elif Ozden Yenigun**, Senior Tutor, Royal College of Art, School of Design, Textiles, **Hongning Ren**, PhD student, University of Manchester **Xiao Tan** and, **Han Zang**, Master students, Royal Colloeege of Art.



Capacitive Folding Jacquard Weave

Advanced Textiles Materials and Processes

Capacitive Folding Jacquard Weave is a series of samples resulting from the collaboration between the Kyoto Prefectural Centre for Northern Industry (or Orikin Centre), Japan working with the international network created by the annual Textiles Summer School in Kyoto initiated and directed by Prof. Julia Cassim since its inception in 2018. The overall aim of the project has been to explore new weave and product possibilities using the weave, yarn, and process technology of Tango chirimen crepe, a traditional kimono fabric from Kyoto and the Japanese Jacquard loom.

The exhibited samples were realized by Tincuta Heinzl from Loughborough University in collaboration with Yukihiro Tokumoto from the Kyoto Prefectural Centre for Northern Industry. The sensing circuit was engineered by Tomohiro Inoue from Kyoto Institute of Technology. The sound is composed by Suguru Goto from Tokyo University of the Arts. Some preliminary coil-woven samples were produced by Cosmina Maria Anghel under Tincuta Heinzl's and Dani Strickland's supervision.

The design concept aimed to pay homage to Issey Miyake's 'Pleats, Please!'. The project combines the pleated structure of textiles with the principle of capacitance, sensing the changes in capacitance caused by the expansion and contraction of the pleats to produce a sound as with an accordion. Conceived as a pedagogical tool for the teaching of e-textiles, the project aimed to introduce the students to both Jacquard weave and the notion of capacitance in e-textiles. The collaboration aimed to indicate what could be achieved with the process of Tango chirimen crepe production technology used in combination with electronic programming and the special characteristics of the Japanese Jacquard loom.

Tincuta Heinzl – is Senior Lecturer at Loughborough University (UK). **Yukihiro Tokumoto** – Textile Engineer and Researcher, Kyoto Prefectural Institute for Northern Industry, Japan. **Tomohiro Inoue** – Supervisor, Digital Factory, Kyoto Design Lab, Kyoto Institute of Technology / FABLAB Kitakagaya, Japan. **Julia Cassim** – is Visiting Professor at University of the Arts, London, Nara Women's University, Kyushu University & Akita University of the Arts, Japan. **Suguru Goto** – Composer and professor at Tokyo University of the Arts, Japan. **Cosmina Maria Anghel** – Master student from National University of the Arts, Bucharest, Romania. **Dani Strickland** – is Professor at Loughborough University, Loughborough, UK.

Photo credit: Cosmina Maria Anghel

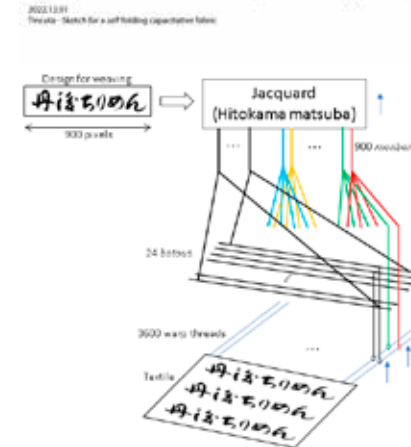
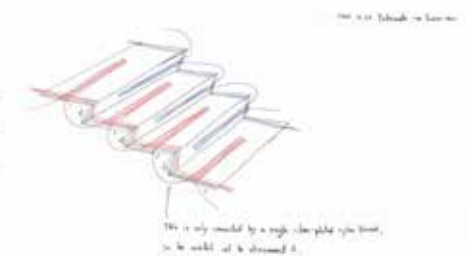
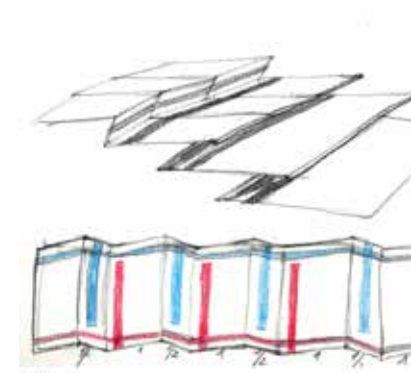


Photo credit: Yukihiro Tokumoto



TEXTILE INTERSECTIONS

Curated by: Hanna Landin, Bruna Petreca and Riikka Townsend.

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