



Loughborough  
University



# INTERSECTIONS EXHIBITION

Collaborations in Textile Design Research  
Textile Design Research Group at Loughborough University  
In collaboration with Royal College of Art and Imperial College  
London 12 - 14 September 2019



Intersections celebrates the breadth of creative collaborations in textile design research.

Centred around the four themes of textiles and architecture, textiles and interactions, textile materialities and processes, as well as critical textiles, this exhibition considers the powerful role of cross- or interdisciplinary collaborations to advance research in the field of textiles. From novel material surfaces, data interfaces and social innovation to wearable technology, the built environment and the circular economy - the future of textiles is here to explore and to address the issues we encounter today.

Organised by the Textile Design Research Group at Loughborough University in collaboration with Royal College of Art and Imperial College London exploring collaborations in textile design research held at Loughborough University London between 12 – 14 of September 2019.

## INTERSECTIONS

### Collaborations in Textile Design Research Exhibition

Curated by:

Dr. Laura Morgan, Fellow in Design and Material Futures, The Centre for Fine Print Research, University of the West of England, Bristol.

Dr. Amy Winters, Lecturer, Soft Systems, Textiles, School of Design, Royal College of Art.

Ricardo O'Nascimento, PhD candidate, School of Design and Creative Arts, Loughborough University.

Emma Wood, PhD candidate and Lecturer, School of Design and Creative Arts, Loughborough University.

[www.textile-intersections.com](http://www.textile-intersections.com)

[#textileintersections](https://twitter.com/textileintersections)

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# Light My Elbows: A Cycling Jacket Incorporating Electronic Yarn

The Advanced Textiles Research Group, Nottingham Trent University

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This jacket can help to alert road users to the presence of a cyclist through the movement of LEDs (light emitting diodes) in the elbows. The LEDs are included within a specially developed electronic yarn, incorporated into a bespoke weave. The weave includes fluorescent and retroreflective yarns to create a pattern suitable for use in a contemporary, multifunctional jacket. The electronic yarns fit into the jacket unobtrusively, without interfering with a cyclist's movement or with rucksack straps. This working prototype demonstrates the potential for further collaborative ventures in which electronics are integrated into garments that are stylish, functional and 'wearable'.



**Role of Collaboration:** Interdisciplinary teamwork was required to design then make a woven cloth in which electronic yarns containing LEDs were placed precisely within a weave structure, to be positioned on the elbows of a jacket. Collaboration between a weaver and pattern cutters was required to create bias-cut sleeves in which the electronic yarns emerged at selected positions to be made up into a circuit. Embroidery techniques were developed to connect the electronic yarns together to create a circuit, maintaining the flexible, conformable nature of the cloth whilst incorporating electronic functionality. Double pockets were created to accommodate batteries and a circuit board.

**Artist Bio:** The Advanced Textiles Research Group at Nottingham Trent University develops electronically-active, wearable technology. Members of the group and associates at Nottingham Trent University worked collaboratively to create the jacket.

The team members were:

Eloise Salter, Fashion Designer and Creative Pattern Cutter, who created the jacket design during her MA studies in Fashion Design  
 Karen Harrigan, Creative Pattern Cutter and Senior Lecturer in Fashion Design.

Matholo Kgatuke, Weave Designer.

Tina Downes, Embroidery Designer and Principal Lecturer in Textile Design.

Sue Allcock, Technical Specialist in Electronics.

Dorothy Hardy, Engineer, Artist and Research Fellow.

Katherine Townsend, Associate Professor in Fashion and Textile Crafts.

# Wall Curtain (mockups)

Danica Pišteková, Mette Ramsgaard Thomsen

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Imagine that architectural space is not an empty void, but it is filled with soft proximities which build different spaces and invites us to visit and experience its inner cavities. The project works with textiles in both the physical and digital realms to show that it is possible to control and manipulate its pliability. The new layer creates a lively interface between the facade and the room, the flat surface and the inner space, and includes the traces of the body accommodated in it, as well as the architecture in which it hangs.

**Role of Collaboration:** Computational approaches challenge architecture. New methods and information enrich the way we build, live or think about space, providing meaningful alternatives to existing practice. While focusing on full-scale examinations, the prototypes act as a collaborative interface between the architectural, computational, technical and material expertise. This collaboration brings an opportunity to rethink or hybridize the rigid perspectives and to establish a complex system, flexible enough to react to different requirements and ideas (moveable, double-curved, ephemeral, sensual), thus creating a new in-between field with blurred boundaries.



**Artist Bio:** Mette Ramsgaard Thomsen's research centres on the intersection between architecture and computer science. In 2005 Mette founded the Centre for IT and Architecture research group (CITA) at The Royal Danish Academy of Fine Arts. In 2010 she became full Professor in Architecture and Digital Technologies.

Danica Pišteková finished her studies at the Department of Architecture, AFAD in Bratislava, where she developed her interest in problems relating to the body, soft architecture, clothing and space. During her doctoral studies, she conducted a research stay at CITA, where she enriched her work with computational approaches.

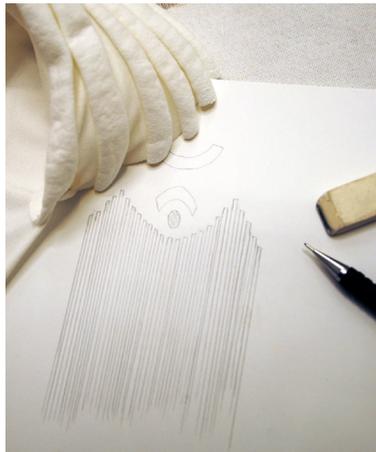
# SEGIA 1, 2 and 3

Prisca Vilsbol

'Programmable Textiles' is an ongoing body of artistic research which proposes to rediscover the poetry of textile design through the lens of additive manufacturing, self-assembly and automation. Using almost no seams, the texture, fit and shape of the pieces are 'pre-programmed' through careful placement of prints and cuts, that strategically weaken, stiffen or texturize the fabric according to the need of that particular area of the garment. Using pattern-making expertise and screen-print techniques, the manipulations and their sequence are optimized to allow for full automation of the process. It is an aesthetic framework, as well as a conceptual and systemic approach to design.

**Role of Collaboration:** The exhibits are a result of a collaboration with textile designers Miranda Tengs Brun and Rikke Lemming Müller, as well as the team behind the immersive concert experience 'SEGIA – Images of a Floating World', premiering in Aarhus in September 2019. The true interdisciplinary aspect of this work, though, lies in the implied collaboration with automation engineers and manufacturing-process designers – exploring the potential of these techniques for furthering aesthetic, sustainable and efficient manufacturing processes.

**Artist Bio:** Prisca Vilsbøl is a Copenhagen-based entrepreneur, design researcher and technologist working in the field of sustainable innovation. With her former company Vilsbøl de Arce, she created sculptural and handcrafted fashion collections, worn by the likes of Lady Gaga, Rihanna, Peaches and more. Her background as a master pattern-cutter, combined with an interest for innovative materials and technologies, has brought her to experiment with biomaterials, CNC fabrication, additive manufacturing and programmable textiles. She takes a fusionist approach to the technical, theoretical and aesthetic challenges of the medium at hand, and strives to combine them into poetic and minimalistic translations of complex processes.



# High Water Pants: Tangible Intersections of Everyday Cyclists and Climate Change

Heidi Biggs

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The High Water Pants were designed to speculatively explore the intersections of everyday cyclists and climate change. Because climate change is difficult to perceive at the scale of everyday life, the pants were designed as a cycling-specific garment which 'bends time', layering future sea-level rise predictions over the ride-in-progress through subtle, tactile cues. The pants work by actuating and dynamically shortening within areas predicted by NOAA to be impacted by sea-level rise in the future which were translated into geofences. The pants leverage cyclists' embodied knowledge of Seattle's geography and climate into ways to notice and speculate about their futures with higher sea levels.

**Role of Collaboration:** This project integrates design research, e-textile techniques and climate science. The project was supported through guidance from Professor Audrey Desjardins, an interaction designer and researcher, Professor Afroditi Psarra, an e-textile artist, and Dr. Guillaume Mauger, a researcher with the University of Washington's Climate Impacts Group. The project used design research methods to define a space to intervene in the intersections of climate change and everyday cyclists. Further design and development of the project required e-textile influenced prototyping and construction methods and ongoing feedback from Dr. Mauger to fully understand and accurately integrate climate change data and projections into the garment.

**Artist Bio:** Heidi Biggs is a trans-disciplinary designer. She recently graduated from the Master of Design program at the University of Washington's School of Art + Art History + Design and has a background in web design, fine and time-based arts, and English Literature. As a researcher, she is interested in investigating tactile interactions which leverage embodied knowledge, alternative value structures and outcomes for design research and human/non-human interactions. Her most recent research includes creating time-bending wearables for everyday cyclists, which make climate change projections tangible and building wearable, electronic instruments that interrogate gender binaries.



# Artisanat d'art du cheveu coupé (Craftsmanship of cut hair)

Antonin Mongin



Inspired by the hair work craft practice which disappeared in the middle of the 20th century, this research project joins scientific activities and manual skills in dialogue with textile design, with the aim of placing cut hair in a new category of creative material intended for art craftsmanship.

The project is conducted through four experiments, each developed by typology of precise fibre lengths, enhanced by textile techniques coupled with chemical processes, selected and adapted accordingly. Each hair donation is processed individually. These textile models are technically reproducible but are made unique by each donor's cut hair in the material.

**Role of Collaboration:** Hair can be considered as part of the Natural Material of Animal Origin's family, but its specific properties can be of interest to material science in hair's capacity to be traced back to its original owner. The creative

material of craftsmanship practice is generally assimilated to a «standard» material, which is why we question this material that is specific to each individual, by working with its particularities and considering its intrinsic added values to the properties usually taken into account in Materials Science.

**Artist Bio:** Antonin Mongin is a french textile craftsman and designer who works in Paris. Following his master's degree in textile design and material obtained in 2016 at the École Nationale Supérieure des Arts Décoratifs de Paris, he joined the Soft Matters research group as a PhD student in Art and Sciences SACRe (PSL Research University Paris). In 2017, he received the prize for the Young Creation of French Art Professions (Prix de la Jeune Création des Métiers d'Art), which rewarded his first research results. He is currently pursuing his research in his second year of a PhD at EnsadLab.

# Critical Materialities of Textiles and Ecology

Frances Joseph, Miranda Smitheram

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The installation presents documentation of work from the Phenomenal Dress project, where processes of making-with ecosystem and localised phenomena have been used to co-develop mediated materials, textile surfaces and dress-like forms through material-aesthetic activations. The ecosystem is recognised as primary collaborator, repositioning human and more-than-human relationships. Based at Karekare Beach, New Zealand, the project is Informed by New Materialist philosophy and New Zealand Mori perspectives. The complex mesh of relationships at Karekare is understood through the concept of whakapapa as layers of connection, a genealogy of people, place and things. This ontological shift moves away from a focus on the human subject and matter as object, to emphasise agential relationships and interconnectedness through “the active materials that compose the lifeworld” (Ingold 2012).

**Role of Collaboration:** The project has been developed with an expanded view of collaboration as ‘working with others’ to include human and more-than-human participants. Our main collaborator is Karekare Beach, its life and the forces and systems that influence or connect with it. A key collaboration is between the two artists who bring diverse cultural and disciplinary backgrounds and expertise to the project. We have worked with other human collaborators including dancers, matauranga Maori advisors, scientists, engineers and artists and with various apparatus, materials and devices that have extended our human capabilities while also bringing their own mediated perspectives and histories to play.



**Artist Bio:** Miranda Smitheram: Miranda currently holds a Maori Postdoctoral Research Fellowship at Auckland University of Technology, with a research profile as an interdisciplinary designer, researcher and artist. Miranda’s research practice moves between digital, virtual and physical states, with a particular emphasis on new materiality within and through processes.

Frances Joseph: Frances is Professor of Material Futures and the founding Director of the Textile and Design Lab at Auckland University of Technology. She has a professional background in sculpture and design for performance, including puppetry. Her current research is focused on issues of materiality, environment, and making across fields of art, material science, design and ecology.

# X-Kite: Upcycled Pullover with 3D Printed Pockets

Gozde Goncu-Berk

X-Kite aims to give a new life to the retired kitesurfing kites and to experiment with the direct 3D printing of polymers onto textiles. The kites change between 5-18m in length, which result in large amounts of highly technical and visually appealing textile waste that cannot be recycled in a closed loop. X-Kite utilizes 43 pieces of nonuniform leftover kite material joined by zigzag stitches. X-Kite also features digitally modelled patch pockets created by selective direct 3D printing of thermoplastic elastomer filament onto polyester fabric that required to optimize the printing parameters for strong adhesion between the polymer and the textile.

**Role of Collaboration:** Development of X-Kite required an interdisciplinary approach to design a visually exciting garment and to optimize the parameters of direct 3D printing of polymers onto textile surfaces. From a visual point of view, X-Kite is a contemporary pullover with unique prints and colours borrowed from the old kitesurfing kites to create an energetic and athletic street style. From a technical point of view, X-Kite exemplifies how flexible filaments can be selectively 3D printed on the fabric by blocking certain areas to form a functional pocket structure by optimizing the printing temperature, speed, flow rate, and offset from the printing bed.

**Artist Bio:** Gozde Goncu-Berk is an Assistant Professor at the University of California- Davis, Design Department. She holds a PhD degree in Design from the University of Minnesota, MA degree in Clothing and Textiles Design and BSc degree in Industrial Design. Her research heavily uses interdisciplinary collaboration and teamwork and adopts new technologies to create meaningful experiences and solve real-world problems through Design. She is especially interested in designing wearable products for people with special needs by employing human-centred design processes and sustainable practices in designing wearable products.



# In the Making: Light Emitting Lace

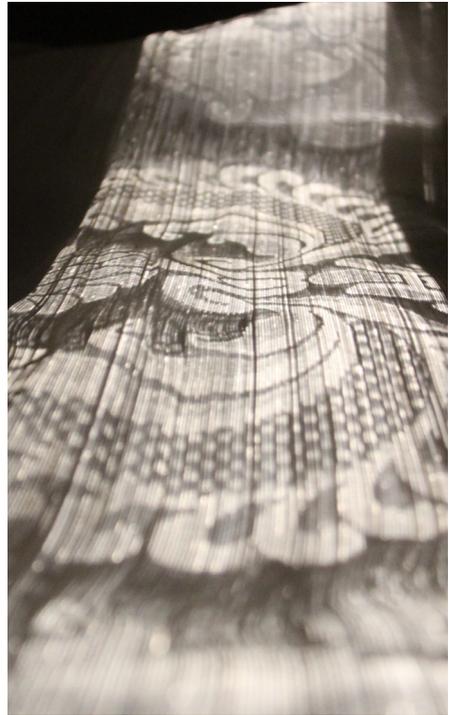
Sarah Taylor, Sara Robertson

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The film captures two, interconnected research projects by Dr Sara Robertson and Sarah Taylor of industry and academia based, practice-led collaborations: Light Emitting Lace (2016-2017) a materials-led academic and industry research project and feasibility study in collaboration with woven lace manufacturers, MYB Textiles and Innovative Lighting Solutions for Smart Textile Production (2017-2018) a design-led academic and cross-sector project with MYB Textiles and lighting specialists, Mike Stoane Lighting. The film shows the stages involved in developing a combined textile and lighting modular system as a new product and captures the processes and people involved within this.

**Role of Collaboration:** The film shows the development of industrially manufactured textiles as Light Emitting Lace. The process of developing a smart textile artefact created a shared collaborative practice for exploring new processes together, and an aesthetic language for smart textile surfaces. The film showcases an interdisciplinary stage of our research working with MYB Textiles over 6 months using an experimental practice-led process, we developed a wide range of new material prototypes and worked together to explore the feasibility of weaving polymer optical fibre using their existing 100-year-old Nottingham Lace, and Scottish leno lace looms.

**Artist Bio:** Sara and Sarah have been working together for the last 5 years, and our research practice as smart textile designers is deeply collaborative. Through this practice, we have built new knowledge on the production and application of smart textiles. Fundamental to the research is material curiosity and the exploration and pursuit of new, visual aesthetics in conjunction with interactive and performative function. We have recently formed a business Sara + Sarah – Smart Textile Design offering a bespoke service to enable the textile industry to innovate in the area of smart textiles and continue to work on collaborative projects that explore the creative application and artistic potential of smart textiles in different contexts.



# Embroidered Inflatables

Bruna Goveia da Rocha, Oscar Tomico,  
Panos Markopoulos, Daniel Tetteroo

The Embroidered Inflatables are part of a research through design (RtD) that investigated how to create silicone-based inflatables whose design and behaviour are determined by machine embroidered substrates. This process consisted of five sample series that explored different parameters to the fabrication and the interaction possibilities of the soft actuators. Through reflecting on this work, three behaviours were identified, which we refer to as Interaction Modes. Machine embroidery allowed shifting the complexity of the designs away from the casting process, while enabling the creation of a wide range of shapes and behaviours through layering of textile structures.

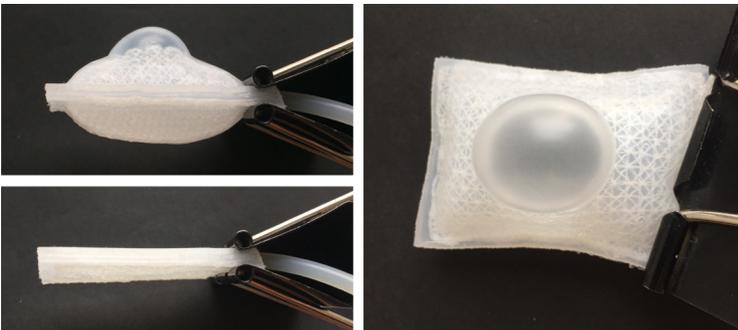
**Role of Collaboration:** The present body of work is part of a wider investigation of actuation in wearables for rehabilitation. It builds upon earlier research on silicone-based inflatables for supporting tactile motion instructions, combining it with machine embroidery to develop reproducible textile integrated on-body applications. As such, in the long run, the aim is to contribute with new ways of bridging active textiles and the healthcare domain by using technical embroidery to develop soft wearables and textile interfaces for rehabilitation.

**Artist Bio:** Bruna Goveia da Rocha (TU/e) is currently focused on researching how to design and produce soft wearables for physical rehabilitation. She is particularly interested in exploring the combination of digital craftsmanship and emerging technologies, such as inflatables, to propose healthcare solutions.

Oscar Tomico (ELISAVA, TU/e) focuses his research on how to design, develop, produce and deploy Soft Wearables.

Panos Markopoulos (TU/e) is currently working on ambient intelligence, behaviour change support technology, sleep quality monitoring, end-user development, interaction design and children, and wearable rehabilitation technology.

Daniel Tetteroo (TU/e) focuses on the design of end-user adaptable systems and technology for physical rehabilitation.





# HAY & HUSK

Alexia Venot

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HAY & HUSK, 2017

Hay & husk is based on the following observation:

Each year, 75,000 tonnes of rice are produced in the Camargue, on a base of 18,000 ha. For meteorological reasons, in most cases, rice straws, considered as waste, are burned or buried in the field. Rice bark, a residue from hulling, is co-produced up to 15,000 tonnes per year, some of which is recovered in the form of energy. This project proposes to value the value of organic waste from rice fields in the Camargue through design thanks to the expertise of various stakeholders. It explores through artisanal processes (traditional papermaking, weaving, finishing) and industrial processes (extrusion, compression) the different qualities, effects and plasticity of the residues, transformed into materials.

**Role of Collaboration:** “Hay & Husk” is a collection of textiles for furniture that has been made possible thanks to various collaborations in France, an agro-industrial chemistry laboratory for the development of a binder-free material, a papermaker in the Camargue and an industry that has made it possible to develop a bio-plastic with rice husks. These collaborations have made it possible to explore the potential for enhancing the value of these co-products while imagining new collaborations between compartmentalized business lines.

**Artist Bio:** Alexia Venot is a textile designer. She first studied textile design at ENSAAMA and joined ENSAD in 2012 where she continued her training in textile and material design, then in Denmark at the Kolding design school. In 2018, she was awarded two design stars by the APCI for her diploma project, entitled HAY & HUSK. Her work questions the role of materiality in the context of the current ecological crisis and the impact that textile designers can have on society. Her work proposes to make the creative processes related to the design of materials, textiles and objects understandable by giving particular importance to the context of the deposit, the design and the operations carried out between the material and its environment.

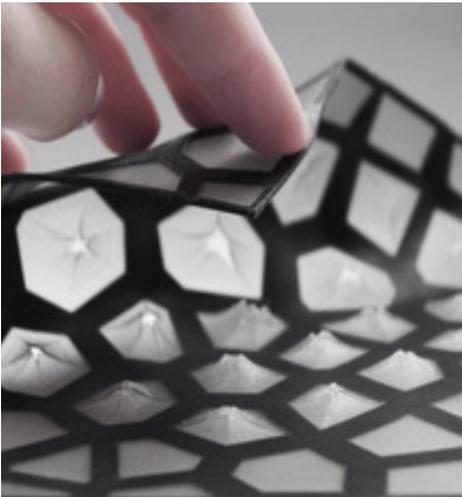
# Re[in]spired textile

Efthymia Douroudi, Maria Voyatzaki,  
Ioanna Symeonidou, Maria Lantavou

Re[in]spired textile is collaborative research on skin prosthetics, able to respire, providing thermal comfort conditions to users responding to stimuli received from the environment.

The design methodology deploys digital technologies that enable further experimentation with complex forms via external stimulations which adapt to different topologies, geometries, scales and environmental conditions. This textile is inspired both in form and function by scales in nature. It consists of an adaptable skeleton, informed by the topology of the body, and aperture-components that open and close in order to achieve natural ventilation, improving the environmental impact regarding energy consumption.

**Role of Collaboration:** Re[in]spired textile is collaborative research on skin prosthetics, able to respire, providing thermal comfort conditions and creating new forms of bodily habitation. This research is taking advantage of the technological changes taking place in the textile and architectural industry and opens new perspectives for transdisciplinary research. The researchers aim to advance the project by developing prototypes and foster collaborations with industry and research institutions from different disciplines such as material science, chemistry, biology and mechanical engineering, creating new materialities for wearables and interactive built environments.



**Artist Bio:** Research team consists of four architect engineers chartered in Greece. Dr Maria Voyatzaki, is a member of RIBA and ARB, Professor of Architecture at Angia Ruskin University and School of Architecture of Aristotle University of Thessaloniki. Dr Ioanna Symeonidou, a specialist in digital media for design and manufacturing, is Assistant Professor at the Department of Architecture of the University of Thessaly. Efthymia Douroudi recently completed her MSc Architectural Computation at the Bartlett School of Architecture and is also an ARB member. Maria Lantavou, a Scene sets designer at National Opera of Greece, working for Stavros Niarchos Foundation Cultural Center.

# Soft Circuitry Kit

Tincuta Heinzl, Bryony King

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The soft circuitry kit is conceived to fill the gap between the already existing electronic boards/processors (LilyPad, Arduino mini, Photon, etc.) and the different textiles sensors and actuators circuits. It aims to support trainers in their teaching of e-textiles, as well as fast prototyping in e-textiles. This new version of the kit proposes several sensors circuits: a matrix-based sensor circuit, a flex sensor circuit, a capacitive sensing circuit, a pressure sensor circuit and a light sensor circuit. The kit also searches to investigate the translation of the circuits into semiotic signs, allowing to recognise the existence of different inputs and outputs into textiles structures.



**Role of Collaboration:** The development of the kit started in 2016 during “An Internet of Soft Things” project at Nottingham Trent University (UK) and was included in the E-textiles Swatch Exchange book from 2016. This new and augmented version presents several new designed electronic circuits and two different types of textiles connectors. The present project is a collaboration between Tincuta Heinzl (concept and design) and Bryony King (embroidery technician) and aims to experiment with the translation of electronic circuits into textile substrates

**Artist Bio:** Dr. Tincuta Heinzl is Senior Lecturer in Textiles at Loughborough University. Her practice and research evolved around electronic and reactive textiles, technical textiles innovation processes, including nano-textiles, as well as social, economic and cultural aspects of textiles industry. She worked on a series of research projects at KHM – Academy of Media Arts Cologne, Berlin University of the Arts (Germany) and Nottingham Trent University (UK). She joined Loughborough University as Senior Lecturer in Textiles in 2017, having previously held a position as Fulbright Senior Research Fellow at Cornell University (USA).

Bryony King is Technical Instructor in Digital Textiles at Loughborough University. Her work in Digital Embroidery is led by the Digital Pathway of the Textiles program. She is responsible for both the teaching of industry-standard software and the practical aspect of the realisation of digital designs into final products.

# Weaving form, forming weave

Riikka Talman, Karin Peterson

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Weaving form, forming weave is a joint venture that explores the materiality of textiles in relation to form through a series of investigations using formable textiles and separable dress moulds. Here, changes in texture, size and shape of the textile and the placement of openings for limbs inform the shape of the mould and direct the placement of the textile. Likewise, the mould informs the shape of the garment through the textile's ability for change. This allows for close communication between the textile and the form as both are developed in conjunction, from initial sketch through to final garment

**Role of Collaboration:** Traditional methods of cut and assemble in garment making is accused of disregarding the importance of the materiality of textiles, and the three-dimensionality of our body. Our joint venture aims to address this gap by investigating the expressive possibilities of woven textiles with inherent form-giving qualities in conjunction with garment moulds. We treat the construction of textile and form as equals through the initial design process, rather than as two isolated entities meeting at the point of final assembly. Bringing to the collaboration our respective specialisms in textile and fashion, we strive to bring new knowledge to both fields.

**Artist Bio:** Riikka Talman and Karin Peterson are enrolled at the doctoral program in Textile and Fashion design respectively at the Swedish School of Textiles. Riikka's research explores how different materials can be combined with textile structures to create textiles with abilities to change or evolve over different timespans, suggesting alternative ways of designing and perceiving textiles that accept change as one of their qualities. Karin's research explores form giving and crafting of surfaces as a simultaneous act of doing in dress as an investigation of making and thinking, questioning the cut assemble method perceived as the dominant method within the field.

# Atayal Modern Times - Camouflage Suit

Chanee Choi

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The camouflage suit attempts to deliver a new narrative idea about the identities of Atayal female indigenous weavers and the period of Japanese colonization (1895-1945).

Collaborations are an indispensable part of Manonik's garment creation. "American Locality (2017)" explores the color of locally grown Japanese indigo and the use of organic cotton. As locally grown "Japanese indigo" is still scarce and is in an experimental stage in the US, a collaboration with a dedicated independent farmer like Jeff Silberstein becomes crucial. In addition to the Japanese indigo, this piece uses organic cotton as the base fiber, and thus thread, which also is grown and produced domestically through a group of farmers and mills.

**Role of Collaboration:** In this project, I imagine that the Atayal are still living under Japanese colonial rule. I explore how they may have related to post-internet art theory and how this might have affected the development of their fashion, and fashion history, considering the safety and freedom of invisibility within systems.

**Artist Bio:** Chanee Choi is a multidisciplinary interactive artist. Her artwork combines Korean traditional crafts and new media, forming a hybrid genre focused on immersive experiences. She is currently researching fashion-tech design and human-computer interactions to create the interactive installations that immerse the audience in mind and body. Wearable technologies help to weave the world's narratives - and when she wears them, the sensor detects and reacts on her behalf to those that she wants to confront, so she can calm her nerves and have a moment to make herself hidden. Originally from South Korea, Choi now lives, works, and studies in Seattle, Washington. Choi is currently a second-year Ph.D. student in Art and Technology at DXARTS at the University of Washington.





# The Book my Grandmother Might Have Made

Irene Posch

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Crafting Stories investigates the possibilities and potentials of eTextile crafts in the context of storytelling and interactive books: What qualities can new technological developments bring to this form of storytelling? What forms of interactions and engagement can evolve, or are prevented? What insights to the weaving of technology into our everyday lives result from the making end using of resulting artefacts? The first artefact within this ongoing research is dedicated to re-imagine and re-make an interactive children book incorporating new technologies. An existing handmade textile book from the 1980ies serves as inspiration for interaction scenarios to be augmented with electronic textile techniques.

**Role of Collaboration:** This work blends textile crafts with electronic and digital technology to create new non-written storytelling experiences. The generation is based on interdisciplinary workshops with craftsperson, illustrators, artists, and researchers

**Artist Bio:** Irene Posch is a researcher and artist with a background in media and computer science. Her work explores the integration of technological development into the fields of art and craft, and vice versa, and social, cultural, technical and aesthetic implications thereof.

Her research and artistic work has been presented internationally within conferences as well as museums. She is Professor of Design & Technologies at the University of Art and Design Linz.

# Rubble as heritage, Matter of design research

Anna Saint Pierre

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Les Petites Affiches a Parisian building dating back to 1922 and subject to rehabilitation between 2017-2018, 111.39 kg of rubble were collected to explore how they could be textilised. Some fragments were grinded and sieved to achieve the fine grain of a pigment before being mixed with a binder. The ink obtained, charged with the site's history, was printed on textile using silkscreen methods. Inspired by the printing history of the building, the designed pattern (developed in collaboration with the graphic design studio Rimasùu) acts as a reminiscence of the void left by the site new configuration. (Other fragments of stories evacuated from the site a long time ago, but preserved in the form of paper archives are also embedded into the printed pattern: plans of the St Honoré cloister, building permits, photographs, newspapers...).

**Role of Collaboration:** Sitting at the intersection of textile design and architecture, this PhD relies on a practice-led methodology informed by the textile and material design background of its main investigator as well as the past, current and future projects of the architectural agency SCAU. In this context, the textile designer acts both as a designer and a researcher, collaborating with the agency's architects and all stakeholders who contribute to the architectural projects

**Artist Bio:** I am a textile & material designer. My current research is an extension of a master's degree in Arts Décoratifs school in Paris (2016) devoted to the up-cycling of rubbles produced by buildings destruction and exploring new modes of transmission through the spectrum of Matter. Since October 2017, it's part of a PhD at the SCAU architecture agency and EnsadLAB (Arts Décoratifs laboratory): «Rubble as heritage, Matter of design research.



# The Responsive Phototropic Fiber Composite Structure

Jimi Demi-Ajayi , Felecia Davis, Julian Huang, Karen Kuo, In Pun

Our team developed a responsive fibre-composite foldable structure by embedding conductive yarns into fibreglass fabric to initiate a response. The innovation dwells in the introduction of electronic components to make an e-textile that permits communication through the fabric via LED's. We were inspired by Choma's origami-Chakrasana and Davis' origami African Burial Ground Memorial/ Museum that communicates its message through its surface. (Testado, 2017, Davis, 2000)

**Role of Collaboration:** The project for the Responsive Phototropic Fiber Composite Structure was a collaboration between landscape architects, architecture students and faculty at Penn State University in the School of Architecture and Landscape Architecture. As part of a semester's coursework, the project was sponsored by the American Composite Manufacturers Association [ACMA] which provided all materials and their expertise in making the project. Students did several independent experiments before a discussion and decision to work with origami folding as a group. The group liked the fact that by focusing on the responsive folding material that it could take on many applications.

**Artist Bio:** Pennsylvania State University, Stuckeman School of Architecture and Landscape Architecture. Artist Biographies for the Phototropic Fiber Composite Origami Pavilion.

Jimi Demi-Ajayi is a Landscape Designer with Olin Studio Landscape Architects in Philadelphia, Pennsylvania.

Felecia Davis, PhD, is Assistant Professor at Penn State University School of Architecture and Landscape Architecture. She is director of SOFTLAB@PSU.

Julian Huang is a graduate of Landscape Architecture at Penn State University School of Architecture and Landscape Architecture.

Karen Kuo is pursuing dual degrees in Master of Architecture and Master of Design Studies in Technology at Harvard University.

In Pun is pursuing a Master of Science in Design at the University of Pennsylvania, with concentration in Advanced Architectural Design.



# Studio HILO

Sara Diaz Rodriguez, Natalija Krasnoperova

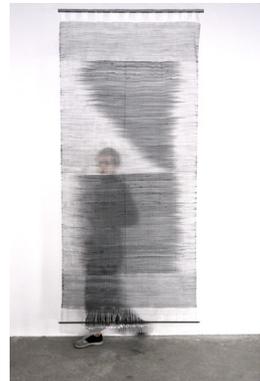
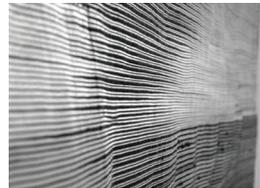
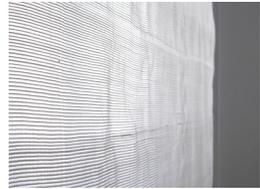
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Studio HILO is a Berlin-based studio for digital textile education. They developed a digital spinning machine pretty much like a 3D-printer: The open-source spinning machine HILO is controlled by a software, which allows users to design and produce their own local yarn. Studio HILO concentrates not only on developing an open-source spinning machine but also a community of designers, researchers, small manufacturers and artists for local yarn manufacturing. The studio offers workshops, training and cooperations on sustainable yarn manufacturing and design, open hardware machines and digital spinning processes.

**Role of Collaboration:** Studio HILO is a design studio that developed an open-source spinning machine and software for local, on-demand and individualized yarn production. By merging the oldest textile technique with open digital tools, we open a playing field for a new yarn manufacturing. Together with students, designers and researchers, we explore the possibilities of a digital spinning machine brought for local, recycled and smart materials. Making transformation tangible starts locally for us – in a co-creative and multidisciplinary approach, we redefine and explore spinning manufacturing with our users.

**Artist Bio:** The textile designer Sara Diaz Rodriguez completed an M.A degree in Textile and Surface Design at the weißensee academy of art berlin (KHB). In her work, Sara researches the relationship between traditional textile techniques and digital fabrication for textile manufacturing.

Sara has worked as a junior researcher and knitting lecturer in the Connected Textiles Group at the Design Research Lab, University of Arts Berlin. Since 2018 she is a junior researcher in the Textiles Prototype Lab project at the KHB. In this project, she analyses and improves textile manufacturing for smart materials.



# E256 - eTextile music controller

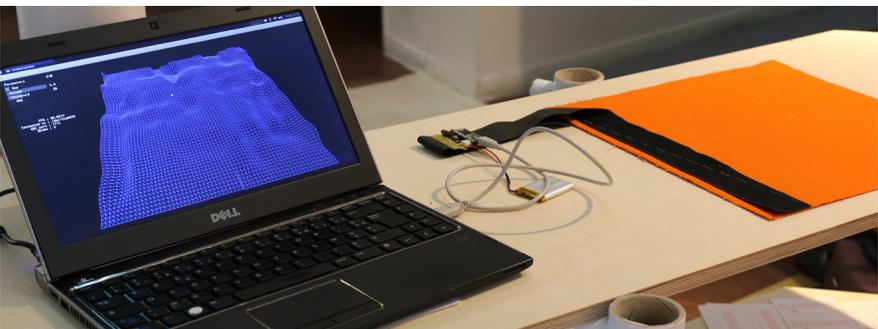
Maurin Donneaud

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The E256 music controller features 30cm by 30cm sensitive textile that allows multi-touch sensing and pressures topographic analysis. Made out of conductive textile shaped in rows and columns and a layer of piezoresistive fabric, this textile sensor is designed to be easy to make. The E256 firmware implements all the functionalities to sense the touch and communicate with audio software such as PureData and SuperCollider.

**Role of Collaboration:** This project has been pushed by contributions with creatives technologist, hardware & software engineers to improve a personal eTextiles practice in the field of electronic music. The project is hosted on a public repository to facilitate a collaborative development (licensing under Creative Commons Attribution-ShareAlike 4.0)

**Artist Bio:** Designer, and programmer, I'm involved in the e-textile and sound design. I design textile interfaces for electronic live performances and art installations. Since 2005 I have been investigating all kinds of technology to build and play music with e-textile interfaces. I have been working with e-textile sensors to free myself from the screen and rehabilitating gesture into digitalmedia handling. In order to do this, I have been learning coding and hacking with other people - building custom electronics to make beautiful e-textile musical interfaces.



# Taxonomy of Line

## Textiles: A touch too much

Aurelia Mckelvey

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The installation communicates research into the everyday use of textiles in relation to function, choice and sustainability. The binary data collected created a weave pattern. The use of patterns and marks on textiles to record ideas and data also echo the traditions of older civilisations. The work draws awareness of how language shapes perception. Tim Ingold (2007) describes how lines are divided into threads and traces, and I have utilised these concepts to show how the perception of textiles is altered when these concepts are defined. Just as a binary system of creating data is the basis of computing, so the way threads are transformed into traces and traces into threads lies at the heart of all textile production.

**Role of Collaboration:** The installation communicates my research into the everyday use of textiles and relates to data collection, linguistics and sustainability. This relationship created the pattern derived from binary data and then inspired an etched, laser-cut and weaved design. The weaved pattern emphasises the connection between binary data, which is at the core of IT and computers and also the Jacquard loom, which was the inspiration for the first computer. How language shapes perception is pivotal. When textiles are perceived as lines, which are either traces or threads, they are reimagined.

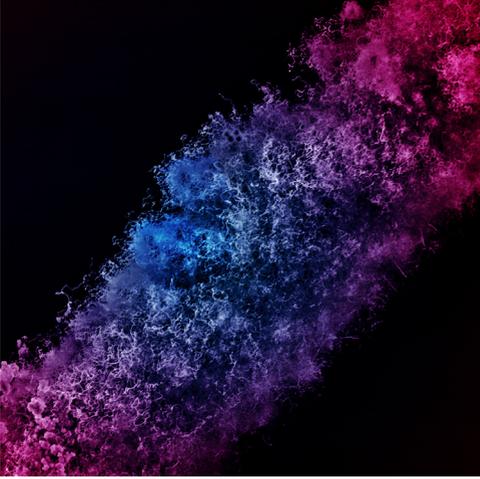
**Artist Bio:** Aurelia Mckelvey is a recent graduate in Textiles; Innovation and Design at the University of Loughborough and is commencing study for an MA at the Royal College of Art. Based in London, she has worked on placements with a number of companies including Alexander McQueen, Tom Cody and in 2015 she collaborated with Space Group Architects, winning first prize in the Regents' Street RIBA windows competition. Her work is characterised by the use of experimental drawing, laser etching and embroidery. She seeks to provoke debate on the nature of reality, language and perception.



# Surfaces, Structures & Soft Systems

Anne Toomey, Amy Winters, Elif Ozden Yenigun, Sara Robertson

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'Surfaces, Structures & Soft Systems' presents a unique vision for advanced materials and a textile led approach to design. An exploration of the way that our SOFT material world resonates with the human condition to find new opportunities and solutions involving human interfaces, user acceptance and experience.

The film takes us directly into the dynamic textiles workshops and laboratories here at the RCA and our collaborations with material scientists, manufacturers, healthcare specialists, architects and engineers. Our hands-on approach of 'thinking through material' addresses the affective and sensory material

values within a technological landscape. Staff and students develop innovative processes, surfaces, structures and soft systems to form products that reimagine our relationships with materials and challenge our traditional definitions of textiles.

**Role of Collaboration:** Collaboration and an interdisciplinary approach are at the heart of much of the research undertaken by the Soft Systems research group at the RCA. Outcomes encompass novel systems around the Built Environment, Wearable Technology, CMF and Gallery contexts. Research projects include CraftTech, hybrids frameworks for smart photonic materials, Footfalls and Heartbeats optical fibre sensors within knitted structures and a Design-led interrogation of Graphene to develop a platform of material formats for designers.

**Artist Bio:** The Soft Systems Research Group aim to develop uniquely fluid, flexible and infinitely adaptable ways of questioning, examining and solving some of the increasingly complex societal challenges of the twenty-first century through textiles. Addressing global issues concerned with BioMaterials (circular economy, synthetic biology), Active Materials (hybrid assemblies, soft robotics, materials as agents), VR/AR (immersive environments, novel interactions, material-led data) and Craft & Technology (skill and craftsmanship).

Textiles at the RCA is a multi-faceted discipline, and we work at the creative interface between materials, making and meaning. Our focus is on new knowledge that impacts across many sectors, exploring new territories for tomorrow's Textiles specialist.

# Harakeke nonwoven bio-composite samples, Harakeke nonwoven with harakeke taniko video projection by Tanya Ruka.

## An evolving net(work) of knowledge for harakeke materials and textiles.

Faith Kane, Kurt Komene, Peter Brorrens, Marie-Joo Le Guen, Tanya Ruka, Angela Kilford, Rangi Te Kanawa, Huhana Smith

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As the interdisciplinary field of materials design expands, pressing environmental, social and economic crises mean that the impacts of materials are more clearly perceived. This presents a challenge to activate materials towards positive change. Design practices that are relational, place-based and deeply attuned to justice and the Earth are needed (Escobar 2018). This team submission presents work that aspires to such design practice and comprises of a series of new materials concepts resulting from a recent investigation into the development of Harakeke (Phormium Tenax/New Zealand Flax) based bio-composites and nonwovens.



**Role of Collaboration:** The approach to materials development taken draws on notions of place-based design and is underpinned by a collaboration between a textile design researcher based at the School of Design, Massey University, researchers at AgResearch an agricultural research institute and a forestry and biomaterials research institute called Scion, two independent artist/designers, and an expert in traditional harakeke weaving.

**Artist Bio:** The following designers, researchers and artists were involved in the realisation of the prototype material samples presented: Kurt Komene (traditional harakeke weaving practitioner), Faith Kane (textile design researcher, Massey University (MU)), Peter Brorrens (textiles researcher, AgResearch), Marie-Joo Le Guen (materials researcher, Scion), Angela Kilford (artist and researcher, MU) and Tanya Ruka (artist, designer and activist). The accompanying harakeke taniko video was made by artist Tanya Ruka. And, the evolving network of knowledge for harakeke materials and textiles was developed between Faith Kane, Angela Kilford, Tanya Ruka, Rangi Te Kanawa (leader in traditional and contemporary harakeke weaving) and Huhana Smith (artist and researcher MU).



# INTERSECTIONS

COLLABORATIONS IN TEXTILE  
DESIGN RESEARCH

**Curated by:**

Laura Morgan, Amy Winters, Ricardo O'Nascimento, Emma Wood

**Graphic Design:** Creative and Print Services, Loughborough University,  
Laura Morgan, Amy Winters

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