AMBIENCE'11 EXHIBITION
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...WHERE ART, TECHNOLOGY AND DESIGN MEET

EDITORS: ANNIKA HELLSTRÖM, HANNA LANDIN, LINDA WORBIN
In art and design practices, materials and technology are means of expression as well as sources of inspiration. On the other hand, in technical development processes art and design provide meaning, direction and expressions of functionality. In some sense this duality of perspectives is what defines the loci where art, design and technology meet. Over the past ten years, the Swedish School of Textiles have taken part in the ongoing discussion on how practice-based research can further develop our understanding of the expressiveness inherent in new materials and new technology. In this context it is clear that art, design and technology meet in the lab and in the workshop. However, for discussions across borders between the perspectives of art, design and technology we need meeting places outside of the labs and the workshops as well. The Ambience exhibition is an exercise in building such a meeting place, but also an exercise in providing conference space for interaction between artistic practice and theory.

As designers and artists working within a research setting, we often work in parallel with writing, presenting conference papers and exhibiting in different arenas. It is then only natural to include two ways of presenting results at a conference for artistic research; to let paper presentations and exhibition interact to create wider perspectives and deeper understanding. All exhibition contributions have been subject to a peer review process similar to the review process paper submissions are subjected to. And just as for paper submissions, reviews focus on originality and skills with respect to both results and presentation.

This exhibition is the first in the series of Ambience conferences. The conference is organized by the University of Borås in cooperation with Tampere University of Technology and is a part of the Smart Textiles Initiative – www.smarttextiles.se

In this catalogue you will find images, artist statements and/or project descriptions presenting the works displayed at the exhibition.

Welcome to the Ambience’11 exhibition!

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Our work frequently employs textiles as computational devices to generate structural forms. The design of the T-stool originates from an interest in the form of the traditional Chinese ceramic tea stool. These stools are based upon a hollow vessel, often cylindrical in form, which is strong in compression. Alternatively, the T-Stool’s stability originates from the plasticity of a folded convex surface and its transformation into a hollow ceramic shell, approximately 2cm thick (102 cm l. x 60 cm h. x 79 cm w.). Each fold creates opportunities for complex reflections, which are amplified by the use of metallic luster and the crackle patterns that develop in response to the surface stress differentials that naturally occur between the clay and the glaze. We have produced a wide range of glaze recipes to specifically alter the color, reflectivity, and size of the crackle, so that each version would be unique.

The influence of the textile also played an important role during the fabrication process. To produce the T-Stool in ceramic, a 3mm rubber membrane, was constructed over the entire surface to insure its release from the mold. As a result, the plasticity, which was initiated by the first textile, during the form finding stage of the design process, could be reproduced, much larger without producing any visible seams. In our work, the character of the textile has become less striated, and more akin to a membrane that is instrumental in the production of seamless surfaces. This transformation has been complemented by the use of digital tools, and our implementation of the textile as a device to produce alternate forms of malleability, through the use of a single surface.

The mold was built at the Sunday Morning @ EKWC, to produce multiple versions of the T-Stool (102 cm l. x 60 cm h. x 79 cm w.) each with its own uniquely glazed surface. The use of rubber molds with
ceramics is a recent development due to the fact that the rubber impedes the clay’s ability to release moisture. Once a layer of clay is pressed inside the mold to the desired thickness, the mold is removed, piece by piece, over several days. The prototype exhibited here was made using a 3D print, to test how the ceramic clay would deform during the de-molding process.

While the mold has been constructed specifically for ceramics, using rubber, and epoxy, the T-Stool can also be produced in a wide range of materials, using the same mold. The design has benefited from an interdisciplinary approach that combines techniques and tools, both analog and digital, from the disciplines of industrial design, architecture and the wide range of ceramic expertise that is available at the EKWC.

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Digit / Digital @Lab

This is an exhibition of the design and fabrication research work of the @Lab. Located in Atlantic Canada, the @Lab is a multidisciplinary group of architects, textile and electronic artists who develop prototype responsive environments which integrate electronics with traditional craft production.

This exhibition will focus on two aspects of the @Lab’s work — manual craft (using “the digit”) and electronic architecture (using “the digital”) — showing the dynamic interrelationship between manual art and design practices on the one hand, and computational design potentials and restraints on the other, in the creation of responsive objects and environments.

@LAB

The @Lab was established by textile artist Robin Muller and architect Sarah Bonnemaison in 2008. They lead the research and development of prototypes that bring together traditional crafts and electronics. Glowing Curtain, @Lab’s first project, interwove electroluminescent wires with paper “fibres” to create a Mondrian-inspired sliding window panel that could store daytime solar energy to release light at night. In Folded Screen, fiber optics were used as the light source to cast tiny points of light on creased and folded paper to serve as a freestanding room divider.

A second suite of projects explored biologically triggered actuators, pushing the idea of responsive environments to include the effects of inhabitants on space. Cricket is collapsible and portable enclosure that provides privacy for outdoor sports massage. It integrates heat sensors to trigger the opening of “gills” in
the tent walls, providing ventilation. The gills can also be coordinated to move with the patient’s breath, providing a subtle and intuitive form of biofeedback. Flamenco Fan is a collapsible and portable stage set developed for a touring dance company. Its actions (LED lights and moving lacy flaps) are triggered either by the sound of a violin or an accelerometer sensor or attached like castanets to the dancer’s wrist.

A recent project is a seasonal outdoor warming hut built for several months of public use during the Canada Winter Games. Circular benches equipped with seat warmers surround a “snowflake” chandelier suspended from the roof of the 5 meter high pavilion. Changing light and sound effects are controlled by a heartbeat amplifier built into one of the seats.

DIGIT AND DIGITAL
The @Lab’s prototypes share an originating process based equally in craft traditions, digital design media, and the design of electronic systems. We are struck that the manual and the digital are often misleadingly and ironically presented as opposites. Yet they share a root word in “digit”, which refers to a finger of the hand — our primary tool and instrument for understanding and acting in the world — as well as the abstract concept of number — no doubt first counted on fingers! As designers, we are interested in this interface between making and measuring, feeling and analyzing, creating and quantifying.

The exhibit aims to show this idea through large color photographs of architectural models, generations of construction details and the prototypes in their context. Through juxtaposition and scale, these images will make visible the interrelationships between hands, computers, programming and digitally driven machines in the creation of electronic textiles at an architectural scale. A 74 pages color catalogue reflecting on the research experience will be available as well.
ACKNOWLEDGMENTS
The @Lab is funded by the Atlantic Canada Opportunities Agency (ACOA).

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Images previous pages: Winter Warming Hut, 2011. The five meter high pavilion was built to withstand winter winds for several months during the Canada Winter Games in Halifax. This page: Cricket, a massage enclosure, 2010. A collapsible and portable enclosure provides privacy for outdoor massage therapists. Next page: Interior view of Warming Hut, 2011. Circular benches equipped with seat warmers surround a “snowflake” chandelier suspended from the roof. A heartbeat amplifier, built into one of the seats, triggers light and sound effects in the chandelier. Photo: Greg Richardson
Tensed Up - A piece of material demonstrates our field of activity

My work explores the connections between human perception, new materials and digital media. 'Tensed Up', a piece I developed in 2010, consists of a white, feather-like material that 'feels' and reacts to its environment. The material detects electrical energy in its surroundings – both from the movement of people nearby and from strong electric fields – and responds by stiffening, producing an effect similar to hairs standing on end.

'Tensed Up' can be worn as a piece of clothing, but for this exhibition, it is hung from the ceiling in order to show its reactive properties to full effect. The textile hints at – and is intended to question – our fear of electric fields by showing that electricity is within and all around us; it shows electricity as something natural, that can have many different manifestations. The material could, I hope, also have interesting applications in other fields, especially architecture.

'Tensed Up' is made from a woven textile laced with conductive and synthetic nonconductive yarns, capacitors and diodes. High voltages are produced by the conductive yarn and the electrical charge is carried by the textile.

'Tensed Up' combines material behaviour with human perception to enable communication and to raise specific questions regarding increasing fields of electronic technology and our electrified behaviour. A woven textile uses electrical energy from its surroundings via influence by human activity as well as electric fields nearby and passes it in a comprehensible way to the user. For testing it, the textile is attached at the shoulder of the participant and has exposed yarns, which is to represent hair. If he or she is acting fast, the textile hair stands higher and higher it charges up until it wants to discharge in its surroundings. If the material received a huge quantity of electric energy, it gets more inflexible. After that it will
give up its electricity and consequently can interrupt technical devices or give the wearer small electric shocks, after he or she charged it.

INTRODUCTION
In medical technology electricity, which was connected to human body, was used to divine interventions for diseases such as epilepsy. Today people know that all natural structures are based on electric processes, but what does it feel like? In a self-experiment, I used a muscle stimulation device to get a sense of electricity and to create expressions, to transform my body through electric current like Daito Manabe or Stelarc did this before. It was a vague feeling tickling, prickly and strained. My fabric creates this tingling feeling by little electric discharges to the body. In general electricity evokes fear by this uncertain feeling. Today there is skepticism about electromagnetic fields. 'There are no broadly accepted long term methods to cause cancer'[2] depends on mobile phones or power lines. The fear of electromagnetic fields has inspired artists in creating products (p.e. Dunne and Raby). Commercial EMF detectors respond to low frequencies in the range of 50 - 1000 Hz, but it is often unclear on which sources it depends.

DESIGN
The textile is designed as an antenna, that responds in an abstract way to our electrically charged surroundings. I created a loose textile by lace-making, that functions as a power receptor as well as an object of visual and tactile expression for human awareness. Electricity gets perceivable by moving hair and flowing currents. Hair stood on end like in the hysteria in history and in todays topics about electric smog.

RELATED WORK
In public vicinity, electricity cannot affect biology on the cell level. 'There are no broadly accepted long term methods to cause cancer'[2] depends on mobile phones or power lines. The fear of electromagnetic fields has inspired artists in creating products (p.e. Dunne and Raby). Commercial EMF detectors respond to low frequencies in the range of 50 - 1000 Hz, but it is often unclear on which sources it depends.
MATERIALIZING ELECTRONICS

The embodied textile is laced by conductive and synthetic nonconductive yarns, capacitors and diodes. In the first prototype, the received current is amplified via batch induction like in the charging unit of a camera flash - it creates high voltages in conductive yarns and carries charges in textile. In the first steps it required a lot of electronic logic a processor to define electric range and a large unit of capacitors, coils and diodes. I transformed electronic logic to material performance. Finally, in the textile were only used a few capacitors and diodes. I wanted to find a material specific and imminent character.

Here the possibility to changes the shape of material is used by electric charges as a force in every non-conductive material.

DISCUSSION AND FUTURE WORK

The responsive textile is created to sense invisible informations that surround us for adding context. Based on hearing tests, it is possible to work on further material expressions. The textile could maybe be used to indicate electric informations through air. It can sensorial envelope human environment (offices) rely on other disciplines like architecture. Visible material reactions are not as precise as audible signals in our perception, but on the other hand more interpretable It will be explored in future work. The material probe acts like an integrated version of a device.

CONCLUSION

In this project a possibility to enhance and sensitise materials was investigated to explore a changing in perception. Figuratively the textile caricatures the fear of electric fields. The material probe describes electric current as something natural, which has different manifestations. Inconvenient electric charges penetrates skin and technical devices in our closer surroundings. This fabric can ask questions about cultural trends that will emerge from our constantly growing need for energy. And the material - How far can we empathize with it? On questions "What does technology look like?"[3] Maybe technology must fuse with irrational in order to be useful. Beside the technical aspects of textile technologies and electronics, it is important to focus more on human-environment experiences, in particular our (dis-)like of certain common electric/ material technologies.

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Images previous pages: Textile discharges, first textile amplifier
This page: second textile amplifier. Next page: textile discharger on shoulder. Photo: Clemens Winkler.
This is not a lamp.
Woven light is about designing time.
It is about creating an experience for the audience.

Woven light looks like a chandelier, but its balloon-shape is made out of fabric. It is approximately 2 meters in diameter and suspends from the ceiling like any other lamp. But textiles and technology turn Woven light into an interactive installation rather than a conventional lamp.

Inside it an array of electronical sensors and switches, control several lights as well as a fan which inflates the fabric in certain intervals. But already a second after being fully inflated, the air is allowed to escape again, setting the lamp into a rhythmical motion.

Technology allows the object to take a life on its own. It takes over the space, breathing and moving, crossing the boundaries between object and living creature. The result is an experience where the affordance on the emotional level is at stake. On one hand it is actually a very comforting experience to listen to the breathing sound, but on the other hand it is actually quite
challenging to be confronted with an object that behaves like it is alive.

I have a background in sound and participatory art and hold an MFA in Experience Design from Konstfack/ Sweden. The goal in my work is to design time. Sound, form and technology are means I use in order to create experience. Whenever possible I try to let the audience participate in creating the final experience. Woven light is an ongoing research project in which I investigate how textiles and technology can be used as props in a performative methodology in order to design time. It is research through practice.

Woven Light results in an organic and captivating appearance that unfolds over time. It is not longer the object and its function that are the main focus, but how an audience perceives it and for what kind of experience it allows.

The audience and the experience created are vital parts of my projects. My focus lies rather in designing time than form. My work has been exhibited at Piksel Festivalen, Bergen/ Norway, Göteborg stadsmuseum and Jönköpings Länsmuseum. I have performed at Norbergfestivalen, Made Festival in Umeå, Underground Lounge in Chicago/ USA, Piksel Festival in Bergen, CBGB's New York City/ USA and many other places. I have worked with dance performances on a regular base since 1997.
Stringling

"Das Kunstwerk ist das allergrösste Rätsel, aber der Mensch ist die Lösung."
Joseph Beuys

How can a sculpture visualize the joy of performing? How can a public sculpture actually cherish the creativity that lies in each of us?

Originally the idea for stringling came from a proposal for an outdoor sculpture in front of the newly built centre for the performing arts in Jönköping/Sweden. (In collaboration with Jan Carleklev.) The goal was to find a form how sound and movement, the essential elements of all performing arts, could be incorporated into a sculpture.

Stringling is inspired by our first prototypes, designed in a much smaller scale to suit an exhibition setting. But the core idea of creating a sculpture that allows the audience to interact and to be part of a large creation is still present. Suddenly it is not longer the visual appearance that is of central value, but rather time and human participation.

The art work consists of 9 smaller glass panels about 230 mm x 270 mm large. Hung on the wall, they function as touchscreens and turn the wall into an instrument. If you come close to the glass with your hands, sounds
are either turned on or off, or manipulated. Each panel reacts differently. The technique used is inspired by the technique used in iphones. Visitors are invited to interact with the panels - to become a part of what is heard.

In between each transparent glass panel small threads are laminated. Some are conductive threads, but the majority is just cotton. I find it important when working with technology not to underestimate our senses. Although we actually just touch glass, our eyes enjoy the haptic value of the much softer threat. One cannot be sure to what extend a visual appearance stimulates other senses. This stimulation allows us to draw from our memory and to sometimes feel without even touching something. Or maybe it is the contrast between the two materials that stimulates us the most?

Much of my work circles around the senses, especially the haptic senses which is the source of many self initiated research projects. It seems to me that if we are just concerned with visual appearance in design and art, we are missing the rest of the body. We are human beings equipped with at least five senses and addressing more senses than vision can be very exciting. In stringling touch makes all the difference.

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Image: Stringling. Photo: Stephanie Carleklev.
Amplification of Energy

Amplification of Energy explores the potential of alternative energy solutions for fashionable wearables. The current manifestation of the research and explorations of localized energy environments through and around the body is an installation of dynamic garments. The installation is metaphorically using ferrofluid (magnetic oil) to convey oil as the current finite source of destructive energy, as well as visualize the electromagnetic spectrum that is associated with radio frequencies. The final iteration of this ongoing research intends to show how the harvesting of ambient-radiation around the garment will mobilize and exaggerate the movement of the wearer.

When considering the shape our garment design, ready-to-wear became an important element. Many fashionable technology projects or garments in the past have had a very mechanical and/or craft-like aesthetic that were untrue to the concept of our project. We want our garment to be accessible, for our patrons to imagine themselves wearing our garments and becoming centralized energy solutions themselves. Our fabric choices also evolved to be more exemplary of the dichotomy of synthetic and organic. The orange-brown fabric is a color changing synthetic fabric that is dark brown (almost black) and becomes orange when stretched and pulled. The white fabric is of a cotton-nylon blend that is a hybrid combination leading to the grey organic wool and the deep pink silk. The cut of the garments were influenced by the symbolism of line and shape. The natural fabrics were cut to have more curves or straight lines while the synthetic skirt has extreme diagonals. Creating a beautiful contrast, while working uniformly as a full outfit.
Once the physical movements were determined, a small programmable microcontroller was required in order to control the movements and bring life into the garment. Arduino physical computing is well known in academic environments, except these devices are rather bulky, and cannot natively handle large amounts of current or high voltages. However, through the use of custom fabricated hardware we were able to create a low profile solution, capable of providing the high voltages and large currents needed to power both the memory alloys and robotic actuators. Two different actuators were chosen for our three garments in order to provide distinctive and unique motions. It was found that memory alloys worked well in conjunction with gravitational or structural forces. However, they are only capable of providing a force in one direction, either gravity or natural properties of the garment would be required to pull the garment component back into a resting position. In terms of wearability, there was a slight loss of mobility due to the stiffness of the actuator (vs the flexibility of memory alloy) but worked in our concept of an installation.

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Image this page: Ferrofluid - magnetic oil. Next pages: Garments, first a fin like transformation in the back of the grey wool jacket. The back is all grey until the fin reveals a deep pink color. Second, a grey jacket with the front right panel opening itself to expose the beautiful deep pink detailing. Photo: E. Adam Attia
iForm

iForm is a performative sculpture that produces stereo-lithographic sculptures from GPS data generated by the movement of iPhone participants through the landscape. The forms produced operate as sculptural portraits of the cities relational life, addressing the anomalies of representation that are inherent in both concrete and time-based media to conceive of a relational modality for spatial forms.

The project uses the iPhone app Comob that was developed as part of a joint research project between Edinburgh College of Art, University of Edinburgh, and University of Lancaster. Comob.net allows a group of people to see each other’s geographical locations in ‘real-time’. Accessing the GPS data stored on the Comob server, iForm constructs a 3D form for the relative positions of participants. When processed this digital form is given material manifestation as a stereo-lithographic print.

CONCEPT

Each GPS participant generates a point in space based not on their longitudinal and latitudinal position but their proximity to other participants.

Point A:  \( x \text{ axis} = \text{distance between participant A and next closest participant} \)
\( y \text{ axis} = \text{distance between participant A and second closest participant} \)
**Z axis = distance between participant A and third closest participant**

This function, run for each participant every 500ms, constructs a rich spatial visualisation of relative proximity. The resulting form serves as a representation of spatial events or, rather, the representation of space between events. That is, the space between the events of each individual over time, and the events between individuals at a point in time. The work turns relation itself into subject by removing the source of the relation (people) and any external referent (GPS location).

Through a process of transcoding, iForm explores the construction and perception of time-based events as a means of examining the ability of static objects to encapsulate temporal spatial information. iForm aims to question our relationship with physical objects by proposing a modality for representation in which the linear codec of time-based perception is challenged.

How do we as viewers relate to this form? Do we attempt to read it as time-base media and play / rewind its composition or do we extend its empirical logic – supplanting its existence as subject with the relational subject formed between object and audience.

In this manner the work, both in its performative generative state and exhibited perceived state, engages with a relational practice in regard to the fixed object. It proposes a modality for engagement with 3D form in which the investigative perceptual exchange between the audience and art work (and thus by implication the participants and the artist) is cited as the focus of the work.
ACKNOWLEDGMENTS
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Threads - A mobile sewing circle

In Threads - a mobile sewing circle people are invited to embroider an SMS, by hand or with an embroidery machine, and thereby share fragments of everyday conversations with others. We have chosen to work in the form of a sewing circle because it is a social context based on handicraft as well as sharing of everyday stories, experiences, and concerns.

The specific invitation to embroider an SMS is done in order to engage with materials, technologies and practices that are often perceived as oppositional or contradictory. By weaving these together into strange but familiar combinations and constellations we hope to encourage reflection in action on the relation between concepts like private and public, digital and physical, quick and slow, long-lasting and hand and machine. However, at the same time as the seams point at alignments they also point at separations.

The participants add all the nuances to Threads and the artwork comes to life with the participants.

The project was initiated in 2006 by Kristina Lindström and Åsa Ståhl and is now part of their collaborative PhD-project at the School of Arts and
Communication at Malmö University. In its current form, as Threads, it is a collaboration with the five following partners: Swedish Travelling Exhibitions, Malmö university, Vi Unga (a youth-led organization for leadership, democracy and entrepreneurship), the National Federation of Rural Community Centres, Studieförbundet Vuxenskolan (a national organisation arranging study circles). During 2010 and 2011 Threads has been touring Sweden and will all together visit about 25 rural community centres as well as other semi-public spaces. It is planned to continue in other forms.

www.mobilsyjunta.se

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Abadyl of tunes

In the City of Abadyl we try to explore a complex digital space in a setting that invites to participation. We provide a detailed and complex, yet open world that can be utilized in order to generate scenarios for the temporary co-creators of Abadyl, who would then interact in an optional environment and in the end producing new artefacts. Abadyl is a database that contains all the gathered information in different file formats, it is a storage facility for all of the physical artefacts, it is a website used for communication and documentation, it is a map for navigating the City.

Against the self-evident – a thorough indefiniteness, a defined obscurity

A "wild thinking" aiming to undermine the present and prevalent must nevertheless have a starting point, and a location in which to perform its laboratory work. Such a location was placed unintentionally on the map of the possible in the mid-seventies when Swedish Public Broadcasting, educating their listeners how to manage the new stereo technique, were establishing that:

my voice will now be coming from the right,
my voice will now be coming from the left,
my voice will now be coming in between the loudspeakers,
my voice will now be coming from an indefinite location in the room.

This indefinite location in the room is something completely different than the outside location of the natural sciences, the point from which reality is measured and
translated into objectivity. [This point too has proven itself absurd (even if strikingly efficient). Gödel, Heisenberg, Bohr etc] Then instead an indefiniteness within the room, and a voice imperatively calling forth its own elusive presence. Within the room but not clearly where, in many ways resembles the location of the potential in the prevalent, given. A floating possibility hidden in the persistently present.

Abadyl of tunes is a collaboration between Michael Johansson, Jim Hall and Johan Salo. In this project we modify the original Isle of tune framework to explore and create some of the soundscapes of Abadyl. Software used in this project is Autodesk softimage, Adobe flash cs3 and adobe soundbooth. www.abadyl.com

Isle of Tune by Jim Hall is a unique online and iOS sound creation game that allows the user to construct town layouts that generate music to share with others. Roadside elements are your instruments and cars are the players. www.isleoftune.com

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Sonic Metaphors for Material Sonifications

3D printed stainless steel, physical-acoustics, Head Related Transfer Functions (HRTFs).

This series of objects explores a range of metaphors for material sonification dataforms. A dataform is a physical object fabricated from a digital dataset, for example by 3D printing a CAD file constructed from the data. Sonification is the design of sounds to understand information in data measured from any source. Material Sonification Dataforms are objects fabricated from data sets in a form designed to produce sounds through physical interactions with the object.

The Sonification Dataforms in this series were fabricated from stainless steel because it can produce a wide range of sounds when struck, scraped, rung or scraped in different ways. The series of forms are based on familiar objects that produce sounds, such as a bell, a rattle and a mediation ball. These familiar forms provide metaphors for interaction with the sonification and for interpreting the resulting sounds.

The data modulates the form of the metaphorical object to embed information into the sounds produced by interactions with it. The dataset that was used to form this series of objects is itself auditory and psychoacoustic in nature. This dataset known as a Head Related Transfer Function measures how the outer ear filters the sounds coming from different directions around the head. HRTFs capture how the sound we hear changes with the direction of the source. A HRTF consists of 360 spectral filters in a circle around the head and there is a set of filters for each ear. The difference between the HRTFs for the left and right ears characterises the ability to hear surround sounds in space. The dataforms produced from this HRTF data embed the psychoacoustics of surround sound into the shape of the object. Physical interactions with these objects produce sounds that reflect the differences and similarities between different
HRTF datasets. When you interact with one of these Material Sonifications you are hearing the sound of the shape of spatial hearing. Its very recursive.

The first experiment in the series is the Medallion which is two-sided disc in which one surface is shaped by the left ear HRTF and the other by the right. The ridged surface can be tapped and scraped, and both sides can be felt at the same time to compare left and right. Individualised Medallions can be fabricated from HRTFs measured from different people. The form of an individual HRTF makes a very personal piece of jewellery.

The Compass is an extension of the Medallion with pointers at 15 degree intervals that allow more precise analysis. This instrumentation allows a psychoacoustic researcher to engage more closely with one of these complex datsets by holding and handling it to explore both left and right datasets in the same place and time, something that is difficult with a visualisation on a computer screen. The researcher is able to carry the dataset with them and contemplate it away from the computer, or share and discuss it with others. Printing in plastic is fast and cheap and could allow archiving and cataloging, and may also have allow for clinical applications.

The Golden Bell is the first prototype of Physical Sonification modelled on a sonic metaphor. The form clearly indicates how to interact with it and what sort of sounds it will produce. The variations in the thickness of the outer shell of the bell influence the timbre and spectrum of the sound.

The bell prototype has been developed further in the Bronze Bells which are larger and have more exaggerated variations in shape that amplify auditory differences. The inner shell follows the outer to produce more resonances and to reduce the amount of material. The fundamental shape of the Control bell was also printed to allow an analysis of the effects of the data on the shape and consequent sound. The Left and Right bells produce a series of double harmonics that is considerably more complex than the Control Bell. The Left and Right bells also sound different from each other, with different
pitches. When this was mentioned to the psychoacoustic researcher who measured the HRTF data he informed us that the measurements were symmetrical so both bells should sound the same. However when the datsets were investigated it was found that the data were not symmetrical as had been assumed, demonstrating the potential for Physical Sonification to provide scientific insights. The difference in the sound of the two bells also raised the question of the fidelity of the 3D fabrication process. A second reproduction of the Left bell had a slightly different timbre and pitch from the first, verified by a shift in the fundamental frequencies of the harmonic series in a spectrogram. Further work to establish the sonic tolerances of the digital fabrication process is underway.

The sonic palette and gestural range of the Bronze Bells was explored and developed in a 20 minute live-looping performance titled the Sound of One Ear Ringing at the International Conference on Auditory Display in Budapest in 2011. The Bells were rung, struck and scraped in spatial patterns around the head of a performer wearing binaural microphones in his ears. The sounds from the bells were routed to loudspeakers around the audience to produce an immersive soundscape. The sound from the speakers filtered by the room effects and directivity was fed back into the binaural mics to produce a recursive spatial soundfield of looping feedback. This produced a rich texture and diverse palette of sounds that demonstrated the aesthetic possibilities of sonified dataforms.

These early prototypes and performance have established that Physical Sonification Dataforms can generate beautiful sculptural forms, and a palette of sounds with aesthetic and functional potential. They have also identified a space of physical metaphors that may be used to materialise a digital dataset. Current work-in-progress is focussing on the further development of sonic metaphors. The Rattle is formed by melding together the Left bell on one side and the Right bell on the other so that shaking it produces a simultaneous granular sonification of both datasets. This sound may be useful for classifying or distinguishing between different HRTFs measured from different people. The Meditation balls formed from left and right HRTFs can be rolled in the hand to contemplate the Ying of the Left ear in relation to the Yang of the right.

The metaphors of a Bell, Rattle or Meditation balls provide different affordances and cue different ways to interact with the dataform to produce sounds. The metaphor of a familiar sonic object establishes expectations for understanding and interpreting the sonifications that it produces.

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Chair of Paradise

The Superb Chair-of-Paradise, Lophorina Cathedra Superba, is a small, approximately 66 cm long, passerine chair of the Paradisaeidae (chairs of Paradise) family. It is the only member in the genus Lophorina. The male is black with an iridescent green crown, blue-green breast shield and a long velvety black erectile cape covering his back. The female is a reddish-brown chair with brownish barred buff below. The young is similar to the female. The Superb chair-of-paradise is distributed throughout rainforests of New Guinea.

The species has an unusually low population of females, and competition amongst males for mates is intensely fierce. This has led the species to have one of the most bizarre and elaborate courtship displays in the avian world. After carefully and meticulously preparing a "dance floor" (even scrubbing the dirt or branch smooth with leaves), the male first attracts a female with a loud call. After the curious female approaches, his folded black feather cape and blue-green breast shield springs upward and spreads widely and symmetrically around its head, instantly transforming the frontal view of the chair into a spectacular ellipse-shaped creature that rhythmically snaps its tail feathers against the ground while hopping in frantic circles around the female. While
this display is in effect, the blue plumage is in a pattern similar to a cartoon face. Even despite the elaborate display, the average female rejects 15-20 potential suitors before consenting to mate.

Although heavily hunted for its plumes, the Superb chair-of-paradise is one of the most common and widespread chairs of paradise in New Guinea forests. The Superb chair-of-paradise is evaluated as Least Concern on the IUCN Red List of Threatened Species. It is listed on Appendix II of CITES.

This project displays a modified old chair that mimics an action of a bird. The chair is equipped with technology, enabling it to act the same sequence as a particular kind of bird, the bird of paradise does toward it’s potential mate. A potential mate in the case of a chair, a human by-pass. What to understand from this object is up to it’s audience. It may be a political statement, it may be a display of technology or it may be a mere form of aesthetic artifact. As an artist, I shall remain in silence.

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Image: Chair, Conductive threads, Textile with Thermochromic ink print, Arduino board, Solenoids, IR Proximate sensor and ACDC Adapters. Photo: Ingo Randolf & Mika Satomi.
Light and Shadow Play – The sun as an aesthetic trigger for urban textiles

The project investigates how the sun can be utilized to enhance aesthetics through textile surfaces in urban environments. The project explores the interplay of textiles as a sun-screening element within the outdoor public architectural space.

What happens when we use the sun's heat and light to trigger a light and shadow play through a textile surface?

What happens when designing with an unpredictable parameter – the sun – in relation to the predictability of the textile design processes?

The exhibited objects; an interactive 3D model, two animation films and six storyboards, will summarise the research process and results. The interactive model is open for the audience to interact with via their own observations and explorations.

With this project we put forward the concept of dynamic, energy generating sun sails which incorporate printed solar technology. In this way we can create areas of shadow and generate energy at the same time. We also use thermochromic dye (heat sensitive dye) for a playful colour change in the sails. The sun's changing light will create a dynamic light and shadow interplay. Thus its variation in heat will trigger colour changes. Thereby the aim is to enhance aesthetic experiences within the urban environment.

The emphasis of this project has been to develop design dimensions/solutions to be able to create pattern compositions for a continuously changing pattern. No longer is the designed pattern purely on the textile surface, a second pattern is created. The textile surface and the sun form a constantly moving light- and shadow pattern in the 3D space.
DESIGN CONTEXT
Textiles are widely used as sun shading elements in urban environments, be it in old historical environments, like in the south of Spain, or in modern architecture. (Cf. [1])

“Why should sunlight always be shut out? [2]” Why not capture both light and heat and make use of it in design. We believe that the integration of solar technology in textile structures offers a great deal of potential for designers in the future. “Increased flexibility and mobility to generate energy are elements which speak for the integration of solar technology into textile surfaces. Developing new surfaces for energy generation through renewable energy sources is an environmentally friendly answer to humanity’s ever-growing energy need. [3]” The current development within solar technology points towards possibilities for printed solar cells onto textile structures. [4]

We have taken this as a base to develop a conceptual application for the future. This project has been based on a real street scenario, however it has been investigated on scale model.

DESIGN SCENARIO
LAT.:37,23,LONG.:-5,58. South of Spain. Seville. Calle Sierpes. It is summer and heat is trapped in the city. Hot, dusty air makes it, at times, nearly impossible to breathe and the sun is burning down on the ground. Horses, Feria. Flamenco. Wide avenues and narrow streets. The river. Abanicos, the typical traditional fans, waving in the hands for a flow of air. Light - a lot of bright light. Laughter. People buzzing around. Shopping malls. The heart of Andalucía. The Calle Sierpes is covered with sun sails. What a relief. No burning sun on your head anymore creating a play of light- and shadows on the flow of people in the street. Life is pulsing in and out of the boutiques in one of the most popular shopping streets of the city.
DESIGN PROCESS
The starting point of the project has been to use Seville as a scenario to base our observations and explorations in.

A mood board has been created to define the atmosphere in the selected environment. Words and visuals described the mood; happiness, ‘A sunny day’, alive, ‘lived in’, housing environment, traces of living, fragility, rhythm, movement, pulse, etc.

Based on the mood board, basic forms have been selected. Over 200 sails with forms/shapes/patterns have been created using laser cutting technology.

A simplified 3D model of a street section has been built, in which the sun sails have been displayed.

The sun laboratory at The Royal Danish Academy of Fine Arts, School of Architecture in Copenhagen has been used to investigate the sun sails in the 3D model under an artificial sun. The artificial sun creates light and shadow patterns in a street environment during a 24 hour sun path simulation. The main focus has been to observe the changes of the light and shadow patterns in the street environment, created using various sun sail patterns.

The design process and results have been documented, analysed and evaluated.

Thereupon more complex pattern compositions have been developed based on the newly defined design criteria created for this project.

At the second visit to the daylight laboratory in Copenhagen more complex pattern compositions have been tested. The light and shadow play during a 24 hour period from two pattern compositions have been made into animations.

The results have been documented, analysed and evaluated. The results have been formulated in the shape of animations, photos, graphic material and text.

EXHIBITION
The designer can no longer just develop a pattern composition on a 2D surface. The scenario shows that the challenge of the designer is to visualize the coexistence of a three dimensional pattern in space. What will this look like? To what extent can the design be predicted? Or will it be completely unpredictable?

Through experiments and observations we have tried to develop design dimensions, variables, required whilst working with this type of scenario.

Parts of our process and findings will be presented and highlighted in an installation based on eight objects:

The first object is an interactive 3D model of an abstract street. The street is equipped with sun sails and people. The audience can interact with the model. With the aid of a strong spotlight, it will possible to hold and subsequently twist the model in order to observe the moving light and shadow patterns in the street during a 24 hour period. The model can be set-up for any specific day in the year using a mounted sundial diagram.

The second and third objects are two animated films which show two different pattern compositions – one emphasizing a pattern along the street and the other a pattern across the street through a 24 hour sun path. The sun sails will create constantly moving light and shadow patterns in the street scenario.

The fourth to ninth objects are storyboards which contain; an introduction to the project, the main conceptual ideas, illustrated documentation of the design process and results, as well as instructions for how to interact with the model.

REFERENCES

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Images previous pages: Daylight laboratory: moving artificial sun, Daylight laboratory: observing the model, Photo: Henrik Bengtsson. Film stills Animations_1 / Animations_2. This page: Daylight laboratory: set up for animation films, Photo: Pierre Ledendal
Essamplaire: An Approach to Working at the Technology | Art | Design Interface in Textiles

Essamplaire_1: Laser Patterned Flax/PLA Nonwoven is a textile design work that explores the historic concept of a textile sampler, or essamplaire, as an approach to textiles research that sits at the interface between technology, art and design. The piece has emerged from a practice-led research project looking into the development of sustainable sheet materials for design applications. The work investigates the use of flax fibres, sourced locally in the UK, in combination with a biopolymer [3] called polylactic acid (PLA) to create biodegradable sheet materials. The potential to achieve digital surface patterning using laser processing is explored within the work.

The approach taken within the work utilizes conventions of textile design, craft and materials science situating it at the interface of technology, art and design. Such work requires relevant and transparent research methods that enable creative outcomes that engage within a variety of spheres. The piece exhibited at Ambience 11 explores the historic concept of a textile sampler, or essamplaire, as such a method. Within the work, new technology plays a key role in regard to both the materials (PLA fibre) and processes (digital design and laser
processing) used. Within this, there is recognition of the need to consider traditional approaches to textiles when working with new technologies to develop products with aesthetic integrity.

The text that follows expands on some of the concepts and intentions behind the work.

CONCEPTS AND INTENTIONS
Demonstration, documentation, expression, communication.

A textile sampler was in its origin, a piece of embroidery work produced as a record or demonstration of learning and skill in needlework. Established during the 15th – 16th centuries, it was foundationally a pattern book in the form of a piece of linen onto which new stitches, techniques, designs and colour combinations were worked [4]. The form and function of the sampler has evolved over its long history [2] making it a vehicle for multiple creative intentions. Its form has changed to embrace aesthetic functions relating to expression and ornamentation alongside the documentation of material, colour and technique. Further to this, the sampler has often provided a site for the communication of social and cultural values within the domestic sphere. In parallel, interdisciplinary research in textiles often has multiple intentions and outcomes. It often involves the exploration and documentation of new technical processes and materials alongside aesthetic goals, which sit within broader social, cultural and technological frameworks. In light of this, the work suggests that the production of samplers provides a focus for technical documentation and aesthetic expression as well as providing a site for the communication of social and cultural values.
*Essamplaire_1* documents the results of investigations into the development of sheet materials constructed from flax and PLA, which can be laser processed for surface design. It records technical information including construction methods and parameters, explores aesthetic possibilities and design motifs and communicates notions of sustainability through the imagery, materials and processes employed.

**Interpreting, embodying, transmitting**

The term 'sampler' is derived from the Old French *essamplaire*, which means to be copied or imitated [2]. Samplers could be seen, therefore, to provide a framework to embody, maintain and interpret practical knowledge in material form; through repeating, imitating and developing.

The storing or embodiment of product information in the artefact itself has been identified as characteristic of research in textiles that relies on a 'hands on' approach to materials and processes [1, 5]. The outcomes of which are often artefacts and prototype products. The knowledge and understanding of materials and processes gained through such work is identified as relating to sensory perceptions of tactile and aesthetic qualities of materials and products. [8] *Essamplaire_1* suggests the production of textile sampler’s as a way of gaining and transmitting such knowledge.

The imagery used in the piece is based on traditional embroidery plans. The design process employed involves imitating, interpreting and translating the patterns and stitches into digital motifs, which are then laser processed. The piece explores, therefore, imitation and interpretation as a way of integrating new technology, both in terms of materials (PLA) and processes (laser), with traditional working practices in textiles.

**Utility and ornamentation**

The techniques learnt and designs perfected on samplers were traditionally put to use as a means of marking clothing and domestic furnishing [4]. The function of these stitched marks, which were often typographic or numeric, was both utilitarian and ornamental. They provided a system for identifying and quantifying textile articles as well as being a means of decoration and design. Similarly, research in textiles that sits at the interface of technology, art and design often merges utility and ornamentation.

*Essamplaire_1* could be considered as both utilitarian and ornamental as it is both documentary and decorative.

**REFERENCES**


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Design is illustrative of the evolution of society, specialize its practice through technological means, sells it as a spectacle, generalize the consumption and lose in significance by overproduction. The aforementioned characteristics is an open source which can lead to a radical new organization of its own practice. A practice in which the most innovative players crystallize their ideas in a fusion of technological disciplines, providing seamless entities for more advanced solutions.

This research project is an exploration of the possibilities for ‘retooling design’, in which ‘the lifecycles of the product’ are placed in a series of spatial and material continua. The instruments to be provided from a technological research and treat material innovations and production technologies. Seamlessly woven of the various design processes constitutes the design scenario. The design processes want to form this ‘lifecycles of the product’ – from packaging to product, of user and his life-world to its endpoint waste – through a material sciences research.

Shape Memory Polymers are synthetic designed materials and has specified properties or is an embedded system that can evoke new multi functionalities. The so called ‘Smart Materials’ – shape memory polymers (SMP’s) are programmed materials that can change shape, a scenario in which an external stimuli is observed by the material and makes a change as a result. What can mean, shape transformations incited by heat, electricity or a light source with a specific wavelength. Not surprisingly described by Philip Ball as ‘the material is the mechanism’ and emphasized the vague dividing line between what is a material and a mechanism. These materials are designed systems – models that represent a multi-functionality. A horizon which response mechanisms can be developed to adapt to the relentless pace of their audience, with the outcome: flexible patterns of use and management.
SCENARIO
*A Future Beyond the Box*

Packaging, symbolically the last stage in a product’s development, is considered an integral part of the product itself. A seat shape enriched with a performative behavior reveals themselves from a mystical box, or any other form of packaging, to a designed seat shape, its final product. The packaging and the finished product are one and the same material-object and conforms to the classical functions of packaging (efficiency, episode - transport, stacking and protection) and offers a new perspective for self build furniture. Accessories and parts for the self build customer are resolved in the properties of the shape-shifting material, and offer a new perspective for self-build furniture.

Not a single design, but outcomes…

When the desired shape was pursued a stimulus can be used to model the material again, into something else. This new usage rules introduces itself from a specifically designed structure and material properties. It caused incidents of personal fiction to own designed models that hunger from consumers for that unique individual product and winks to the homo ludens. In short; not a single design, but outcomes.

From ‘object’ to ‘abject’

It is clear that the economies of non-recyclable materials constitute a chain of cause and effect, a heritage of the last century where extrapolation and predictions prove untenable. The life cycle of the product must be closed (cradle to cradle, and not cradle to grave design), to bring back the phenomenon ‘abject’ to a design-production environment. Something that has no function or value, absolutely vile, what in our material culture can be traced to the broad concept of ‘waste’. From start to finish, ‘the life-cycle of the product’ aims at optimizing the material. Recently bio-degradable shape memory polymers offer possibilities to lower environmental impact by composting in a particular condition.

Looking ahead - advanced solutions for raw materials

The landscape of technological change causes a revolutionary review of available resources for the production of contemporary materials and raw materials. Within
the research domain of the synthetic biology, Genomatica, has proven a novel bio-manufacturing process. A blueprint of the basis substance for plastic (butanediol) was produced by a genetically tweaked micro-organism, the E.Coli bacteria.

This research scenario offers a spectrum of possibilities, an innovation in which a combination of conscious concept driven approach fuse the contemporary materials and production methods in a new context. Crucial to this context is to bring together the described entities in one material class. Central in the initial stage, the scaling-up of shape memory polymers and its shape constraints. Characteristic to shape memory polymers is the weak force development during the shape recovery, which were developed only small-scale applications. Recent experiments with fiber reinforcement and carbon nanotubes and shape memory polyurethane have shown that scaling-up is a possibility. Accordingly, the degradability will be investigated as well as its essential raw materials.

Technical: The structure of the chair is designed for its transformability, an outcome that can evoke different designed shapes. The thin hard foam layer provides the support, - the structure, positioning itself in such a way that it's located on the inside and the outside. It forms a hard surface that provides, when placed in a certain position, a firm basis for the stability of the chair. Because of the internal displacement of the support thin hard foam layer, another foam layer appears at the top. The foam layer becomes soft and supple by the touch of body temperature which provides the necessary luxury for a comfortable sitting.

The undertaken design-based-research shows that the semi-S shape has a great flexibility for ductility, making an own design. The internal displacement of the hard foam provides a structural guidance for all possible outcomes in shapes. It's easy to imagine that a shape with a hard backrest and a soft sitting area may arise from it. Or partly table and seat differentiated by the hard and soft characteristic. The S-shape is ideal for reducing the design in its packaging shape, a production process that compresses it into a thin plate followed by a roll up process (its final packaging form).

A lightweight construction is necessary, in practice; it's about imprinting personal design onto the structure and overcoming heavy manipulations of the shaping end-user.

The form setting: the intrinsic properties of Shape memory foam help us to rethink and simplify the traditional manufacturing process. Where once complex moulding systems ruled the production of plastic form, now can be done in simplified actions. A custom straight-foamed sheet is heated until it is flexible and modular of character. The soft foam plate gets positioned along a simple mould structure and that causes its final shape. Next, allocating the new shape memory, the semi-S Shape, a new heat treatment fixes up all molecules in this form. A heat treatment that rewrites the shape information. Once the form is assigned to the properties of the material, a downsized process can freeze the chair into its temporary packaging shape.

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Images previous pages: Unfolding foam from plate into arch. Prototype01 – (2008), unfolding seat (http://www.youtube.com/watch?v=GTLwEXvDVYw). This page (left): A: - the hard foam provides a structural guidance for all possible outcomes in shapes, B: - the foam layer becomes soft and supple by the touch of body temperature which provides the necessary luxury for a comfortable sitting. (Right): A: - a custom straight-foamed sheet is heated until it is flexible and modular of character. The soft foam plate gets positioned along a simple mould structure and that causes its final shape. B: - a new heat treatment fixes up all molecules in this form, allocating the new shape memory, the semi-S Shape. C: -Once the form is assigned to the properties of the material, a downsized process can freeze the chair into its temporary packaging shape. Next page: Concept drawing. Photo: Carl de Smet.
Retooling design: ‘the life-cycle of the product’

raw material manufacturing

_rethinking the raw materials_

Transport

shop

home

_a future beyond the box_

_not a single design, but outcomes..._

_from object to abject_
SymbiosisW

SymbiosisW is a continuously evolving reactive artifact, part of a practice based experimental research project. Our design approach was to take a biological element, a multi-layered structure of a living organism as a fundament for Form, Function and Aesthetics, developed from member to member. The biologically inspired artifacts represent the symbiosis between a cyber organism and human.

The general concept in the first place was a tribute to the ultimate power of evolution, where not only the human civilization impacts the environment, but nature itself reacts and adopts to these changes. The idea is to emphasize that humanity is not an outsider, but part of the nature. Instead of criticizing the civilizations consequences on the environment, the possible arise of new types of mutant living beings can be explored.

Our medium is felt as an easily formable warm material. The fabrication process is based on handicraft procedures as well as digital, more innovative techniques.

The key feature of our smart material is to change colour in predefined patches. We have named it an organic display. The ultimate goal of the project is to explore alternative, "organic" interfaces, to emphasize form and function emerging from smart materiality.
SYMBIOSISW
SymbiosisW is a three-dimensional material constructed from hexagonal cells. It senses human touch and, in response, small cell-patterns start to grow from beneath the person’s hand. By keeping the hand against the object, the motive spreads; it is even possible to create the desired arrangements of pattern. Touch is one of the strongest intermediaries, and at the same time, highly personal and intimate. SymbiosisW was the first “living” material created during this project. It can easily find its place in public spaces (waiting rooms and lobbies) where multiple people may interact with it.

ELECTRONICS AND MATERIAL
The construction elements in the material can be explained as different layers of a symbiotic settlement. It is sensing the human action with one of the layers and responding by indicating the changes in the layer of pattern.

SymbiosisW uses textile based capacitive sensors for sensing the touch. Whenever a hand is placed over the material, it changes the analog input signal. The resistive thread is used in order to heat up the desired pattern. Each of the threads are controlled separately and a microcontroller is responsible for switching on/off the transistors. Seven areas in the material are defined as groups of pattern (patches) - for each of the subsets a microcontroller is handling all the input and output actions.
CONCLUSION
The development of SymbiosisO has been an iterative process, starting with rather a conceptual installation. From now on, the aim is to make the material more sustainable and bring it to the next level, from the installation form to possible product developments. The project focuses also on an interactive learning environment for rehabilitation.

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Image previous pages, this page and next page: SymbiosisW
Photo: Anu Vahtra
Pouffy the Breathing Pouf

Pouffy is an animated couch that provides a companionable presence in a room through a gentle breathing motion and sound. The coat of long, wispy faux fur accentuates the rise and fall of the breathing 'body' of the work. Coaxing the onlooker with inviting sounds that softly seek attention, Pouffy appeals to anyone nearby to come close and interact. When sat upon, Pouffy emits an excited and friendly stream of gurgles, warbles and tweets. As the participant sits and strokes the faux fur surface, Pouffy responds with a conversational engaging and entertaining variation of acoustic parameters.

When no-one has time to come and play the subtle vocalizations, whistles and squeaks are a soothing ambience that creates a mood of tranquil companionship.

Twenty121 is an collective of artists, designers and engineers that has been engaging audiences with animated and interactive furniture in exhibitions around the world including Experimenta House of Tomorrow in Melbourne 2003, Playtime at the National Gallery of Australia in 2005, Under the Radar at FACT in Liverpool and the ICA in London in 2006, Media City Seoul 2007, ISEA in Singapore 2008, and Creative Industries week Shanghai 2009. Zizi the Affectionate Couch is now in the collection of the Museum of Old and New Art in Tasmania.

The latest work, Pouffy, like Zizi, is a piece of furn-
iture designed to provide companionship. Pouffy is
designed to be sympathetic to the human condition,
comforting and supportive, an amiable presence or
being in the room. The emotional response to these
works by the varied audiences from the very young,
the very old and in particular those with an intellectual
disability, has defined the value of certain responses
from the environment that maintain and promote
well-being. The soothing, affirming, sustaining and
calming response from Pouffy are the functions that
provide these beneficial effects.

Collaborative projects are one of the most rewarding
methods of making that a group of individuals can engage
with - the collection of family and friends that make up
Twenty121 find that the process from the beginning of
brainstorming an idea, to the final artwork that is formed
through the dialogue with the materials, concepts
and each other, a particularly enriching experience in
building upon the relationships that they already share.
The creative endeavor embarked upon is an opportunity
to blend diverse sets of skills that are complimentary and
allow ideas and projects to emerge that would otherwise
be unachievable by any one on their own.

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Image previous page: Pouffy - breathing in. This page: Pouffy -
breathing out. Photo: Stephen Barrass
I am a textile designer working in the area of light-emitting textiles. My research interest focuses on the exploration of new aesthetics within cloth exploiting the lighting properties of optical fibres integrated within diverse textile structures. My research explores movement of colour through dynamic polychromatic light sequences, as well as the dynamics of monochromatic light through rhythm and motion. The exhibited digital artefact uses optical fibre technology within a braided structure, activated by light-emitting diodes (LEDs) and a microcontroller as an interface to realize novel, light-emitting programmable textiles.

In previous work [1], I have explored the potential of light-emitting textiles, incorporating optical fibres within a variety of textile structures. The main emphasis has been to explore the aesthetic qualities of static light within different textile structures using a combination of fibre optics and additional materials. The lighting mechanism was mainly switched on at night and off in daytime, showing two independent static expressions. However my current research explores the visual effects of movement using light as a continuous time-based medium. Now the textile design pattern reveals its composition, not in one moment of time any more, but in fact over time.

**DESIGN CONTEXT**

The availability of new materials and technologies offer unique technical function and the potential for novel aesthetics. Due to their unique position, textiles are ideally suited to exploit these new challenges. As established technologies, for example colour-change dye systems and light-emitting technologies cross over into new product areas such as textiles; designers will more readily explore the availability of new colour palettes.
and the potential opportunities to design with novel and complex properties. [Cf. 2, 3, 4, 5, 6]. This exhibit is an example of practice-based research aiming to exploit the creative potential of light as a medium for novel, time-based aesthetics within textile artefacts.

**rhythm exercise**
The exhibit *13in1* is an example of my PhD research work which aims to answer the following research question: What does it mean to explore time and changing expression, in the form of continuous movement as an integral part of textile design? The aim is to create time-based textiles, which examine the aesthetics of movement as a fourth-dimensional element in textile design. Light, in relation to textile structure is the main medium of the investigation.

The exhibit is part of a series of experiments, named *rhythm exercise*, which explore new ways of designing with time-based parameters to create dynamic light-emitting textile structures. This series of experiments focuses on the creation of light sequences, which explore how different expressions of movement, rhythm, tempo, play and pause create dynamic tensions.

The three-dimensional braided artefact is based on thirteen lengths of optical fibre. It is lit by LEDs and programmed to create moving patterns of light using a microcontroller digital interface. It has been designed to display different qualities of lighting interplay using varying rhythms and speeds.

The piece uses a newly developed lighting devise system ®, developed in collaboration with the UK electronic specialists, Circatron Ltd.[7]. It is a further developed version of Sarah Taylor’s lighting devise system for *Inner Light* [5]. The system allows coupling the optical fibre ends to the LEDs, and a digital Mix (DMX) replay system controls the lighting sequence via diverse programming processes.

The results of the ongoing research project highlight novel, time-based aesthetics in textiles. The creative use of light within the exhibit promotes the concept
of designing textiles using a new visual language, the use of new design methodologies for realizing this and new mechanisms for design implementation. The desire to challenge new aesthetics using established light-emitting technology has been driven by creative, practice-based enquiry. Whilst both the aesthetic and the mechanical properties of the optical fibres and its related technology are understood, the commercial lighting systems offer limited capacity for advanced, visual enquiry for specialized areas such as textiles. The use of the customized LED lighting design system allowed for greater design flexibility. The adoption of a microcontroller linked to the digital programmable system offered an exciting tool for designing and realizing monochromatic lighting effects. The exhibit shows a glimpse of the new design possibilities and the potential for creative exploitation within this field.

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REFERENCES
2. Berzina, Zane. Available at: http://www.zaneberzina.com/
4. Layne, Barbara. Available at: http://subtela.hexagram.ca/
6. Wingfield, Rachel. Available at: http://loop.ph/view/Loop/WebHome
7. Circatron Ltd. Available at: http://www.circatron.co.uk/

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Textilt Motstånd - Textile Resistance

Textilt Motstånd / Textile Resistance is a collaborative project between Smart Textiles Design Lab and Syntjuntan. The project explores design possibilities of raw textile materials that can be used as textile music instruments, which will be used by Syntjuntan in their music performances.

The project started with a two days workshop together with Syntjuntan, where we experimented with various textile structures and materials that act as variable resistors. These textile were then connected with an analog synthesizer circuit or with computer software to control sound effects.

We take this idea further on to create textile music instruments. The resistance properties of the textile material changes as you press it, wrap it around, hug it and so on, and whatever the way the material and the shape allows us, it let us play the instruments in completely different ways than conventional ones.

We are currently developing a collection of raw textile material samples and also full scale textile audio interfaces that suggests experimental applications.
When you press a keyboard of a synthesizer, making note F, it does not mean more than you made a note F. But if you touch your breast to make a note F, it may mean something more than making a note F. We investigate how some action together with textiles (for example, getting dressed) could sound, as well as how it functions in our social context.

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Mask

This collection of masks is designed to give an aesthetic warning if the wearer is running a fever or the concentration of allergens in the air exceeds a certain threshold. The pattern printed with thermochromic ink changes color when the exhale exceeds 31°C.

The collection comprise a series of different prints and three different shapes of masks: the traditional surgical style, a wrap-around-scarf, and a full-face sinus mask. The latter also senses temperature increases of the forehead as well as around the mouth.

The idea is to create a stylish early-warning system at least for other people if not for the wearer.

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Images this page: (left) ambient temperature 20°C, (right) after breathing. Next page: (left) ambient temperature 20°C, (right) after breathing. Photo: Jan Berg