



SHIFTING PARADIGMS

FASHION + TECHNOLOGY

SHIFTING PARADIGMS

FASHION  TECHNOLOGY

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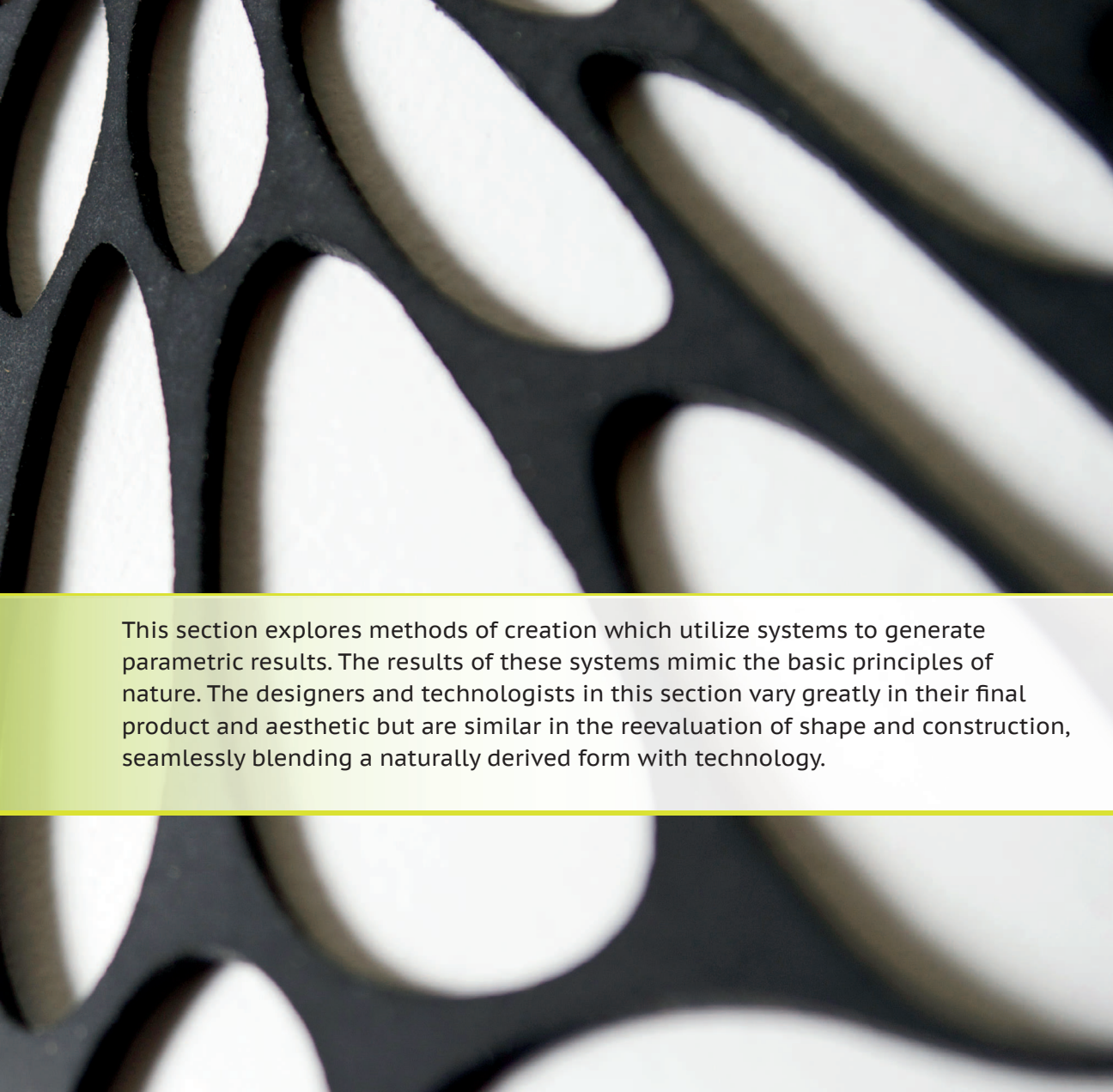
What is the future of fashion? This question is ever present in a designer's mind. The answer is intricately connected to a wide variety of technological applications as the requirements of fashion, clothing and personal identity become more explicit. This exhibition examines present examples of clothing, accessories and online business models that utilize or are developing those new types of technologies. The collaborative creative output of these designers, artists and technologists is beautiful and suggests the enormous possibilities for the future of fashion.

The exhibition is divided into four sections. *Generative Technology* uses algorithmic patterns on a computer to create surprising design outcomes. *Democracy of Preference* presents mass customization tools that allow consumers to co-create with brands and designers one-of-a-kind, individualized products. *Technology and Expression* examines a designer's ability to utilize technology in new and exciting ways, expanding notions of creativity and communication. The *DIY* portion of the exhibition explores the making of fashion technology by showcasing toolkits and materials that anyone can use in their own creations and designs.

Margarita Benitez, Fashion Technologist and Assistant Professor
Noël Palomo-Lovinski, Associate Professor
The Fashion School
Kent State University

The background of the image is a complex, abstract pattern of black, organic, and flowing lines on a white background. These lines resemble stylized, interconnected veins or perhaps a network of paths, creating a sense of movement and complexity. A solid, light green horizontal band is positioned across the middle of the image, serving as a backdrop for the text.

GENERATIVE TECHNOLOGY

The background of the entire page is an abstract, high-contrast image. It features a dark, textured surface with numerous white, elongated, organic shapes that resemble seeds, pebbles, or perhaps a close-up of a biological structure like a leaf or a shell. The shapes are scattered across the frame, with some in sharp focus and others blurred, creating a sense of depth and movement. The lighting is dramatic, highlighting the smooth, curved surfaces of the white objects against the dark, shadowed background.

This section explores methods of creation which utilize systems to generate parametric results. The results of these systems mimic the basic principles of nature. The designers and technologists in this section vary greatly in their final product and aesthetic but are similar in the reevaluation of shape and construction, seamlessly blending a naturally derived form with technology.



Tissue Collection, 2007

1 of 1 is an independent design studio founded in Los Angeles by Cait Reas. The studio synthesizes fashion and art into one-of-a-kind apparel that is made-to-order.

The *Tissue Collection* is a collaboration with artist Casey Reas. Casey Reas writes generative software to explore conditional systems as art. Mr. Reas' work interprets the movement of synthetic neural systems and inspires the unique visuals on the textile prints.

1of1studio.com

Photo of Tissue_01-124
Digitally Printed Silk Charmeuse
On loan from Cait Reas, L2013.30.5

Generate Collection, Shift Series, 2013

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In *Generate Collection, Shift Series* Cait Reas developed a series of images utilizing a custom generative design software tool developed by Casey Reas. The images appear as silk prints and free hand machine embroidery. The *Shift Series* explores proportional and graphic variations within a shift silhouette.



Poly Tulle overlayer with  
100% silk underlayer  
On loan from Cait Reas, L2013.30.10

GENERATIVE TECHNOLOGY

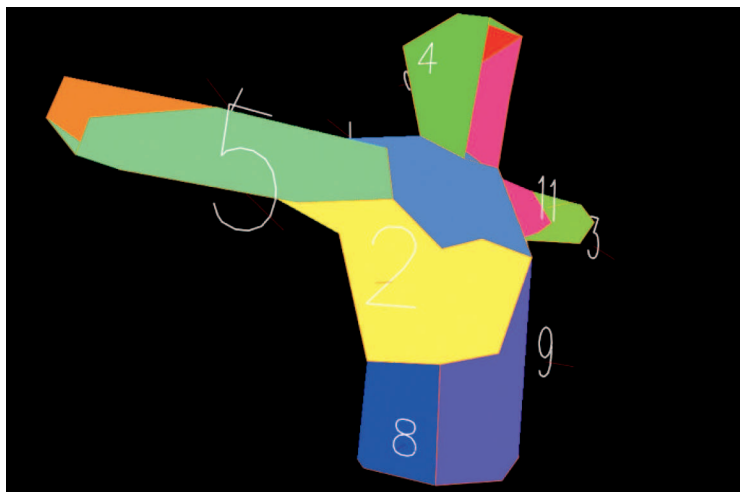


Photo (top): Betabrand

## DARPA Hoodie, 2010

BetaBrand is an online-only clothing company based out of San Francisco that collaborated with San Francisco technology and design firm, Otherlab to create a unique no-waste garment titled the *DARPA Hoodie*. The technology behind the hoodie's design stems from Otherlab's algorithmic software that represents 3D objects as flat panels, which was developed for United States Defense Advanced Research Projects Agency's (DARPA) Programmable Matter Project. The numbers in the top image refer to the fabric panels that create the hoodie.

[betabrand.com](http://betabrand.com)

Organic Cotton-Hemp Knit  
Anonymous Loan, L2013.15.1

## MyDesigner, 2008

Cedric Flazinski is a design researcher and interaction designer based in France. His *MyDesigner* shoe collection subverts traditional mass manufacturing and offers a model for more specific mass customization by using an interactive shoe design generator, *MyBrand*, to assess the consumer's morals, beliefs, preferences and self-perception. The 12 *MyDesigner* shoes showcased, both in the exhibition and video, are examples of different individual shoe results generated from the *MyBrand* software.

[mutefirst.free.fr/mydesigner/](http://mutefirst.free.fr/mydesigner/)

12 shoes, white leather  
On loan from Cedric Flazinski,  
L2013.20.4,.5,.6,.2,.7,.12,.8, and .1  
(shown left to right, top to bottom)



GENERATIVE TECHNOLOGY



## D.dress, 2007

Continuum Fashion, founded by Jenna Fizell and Mary Huang, is a “part fashion label, part experimental design lab.” The company’s goal is to create made-to-order designs through the use of digital technologies. Continuum Fashion produces “computational couture” clothing and accessories that are designed and manufactured via modern technologies. The *D.dress* collection is actually a piece of software that allows users to create their own made-to-measure, low-resolution triangulated dress.

[continuumfashion.com](http://continuumfashion.com)

Cotton poplin  
On loan from Mary Huang,  
Continuum Fashion, L2013.1.1



## Vessel Pendant, 2013

## Cellular Pendant, 2013

## Radiolaria Necklace, 2012

Nervous System is a generative design studio founded in 2007 by Jessica Rosenkrantz (Creative Director) and Jesse Louis-Rosenburg (Chief Science Officer). The company utilizes custom-coded online design tools and 3D printing technology to create beautifully delicate and elegant organic designs that capture the essence of biological forms in nature.

n-e-r-v-o-u-s.com

Silver Glossy  
On loan from Shapeways, L2013.34.7

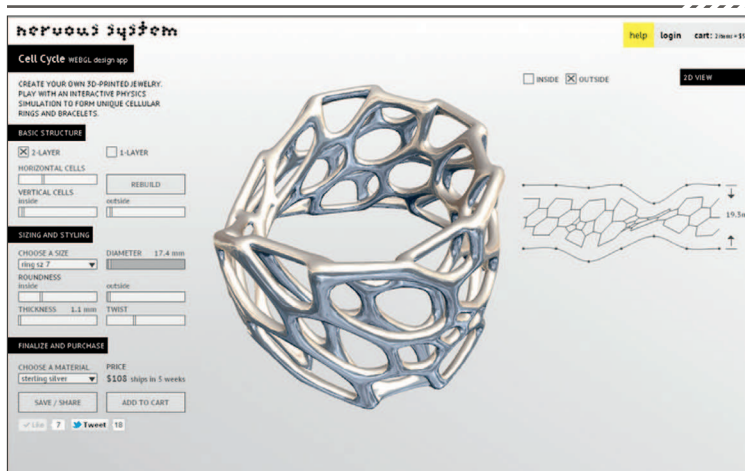
Neon Yellow 3D printed nylon  
On loan from Nervous System, Inc., L2013.13.3

Black laser-cut silicone rubber  
Anonymous Loan, L2013.15.2



GENERATIVE TECHNOLOGY

# NERVOUS SYSTEM



## Cell Cycle Design App, 2007

### Sub-Division Cuff Bracelet, 2012

Nervous System's interactive generative design tools utilize algorithms to explore specific biological processes. These generative designs are then translated into physical objects through the use of various 3D printing technologies. Interactive web-based design modules, such as *Cell Cycle*, and the use 3D printing allows for affordable individual customization of their bio-inspired forms. The *Cell Cycle* 3D printed designs are available in nylon, stainless steel, and in sterling silver cast from 3D printed wax. The intricate bi-layer forms would be impossible to create by traditional manufacturing methods.

[n-e-r-v-o-u-s.com/cellcycle/](http://n-e-r-v-o-u-s.com/cellcycle/)

Black Strong & Flexible  
Anonymous Loan, L2013.15.4

# GENERATIVE TECHNOLOGY

## Soundwear, 2007

Simon Thorogood is a London fashion designer and artist who coined the term “Phashion,” a word created by blending the words fashion and ‘phase transition’ (the changing from one phase of matter to another). In *Soundwear* fashion design ideas are animated by combining music with a library of drawings, colors, textures or photographs. The synesthetic application encourages users to interact and compose a fashion design creation.

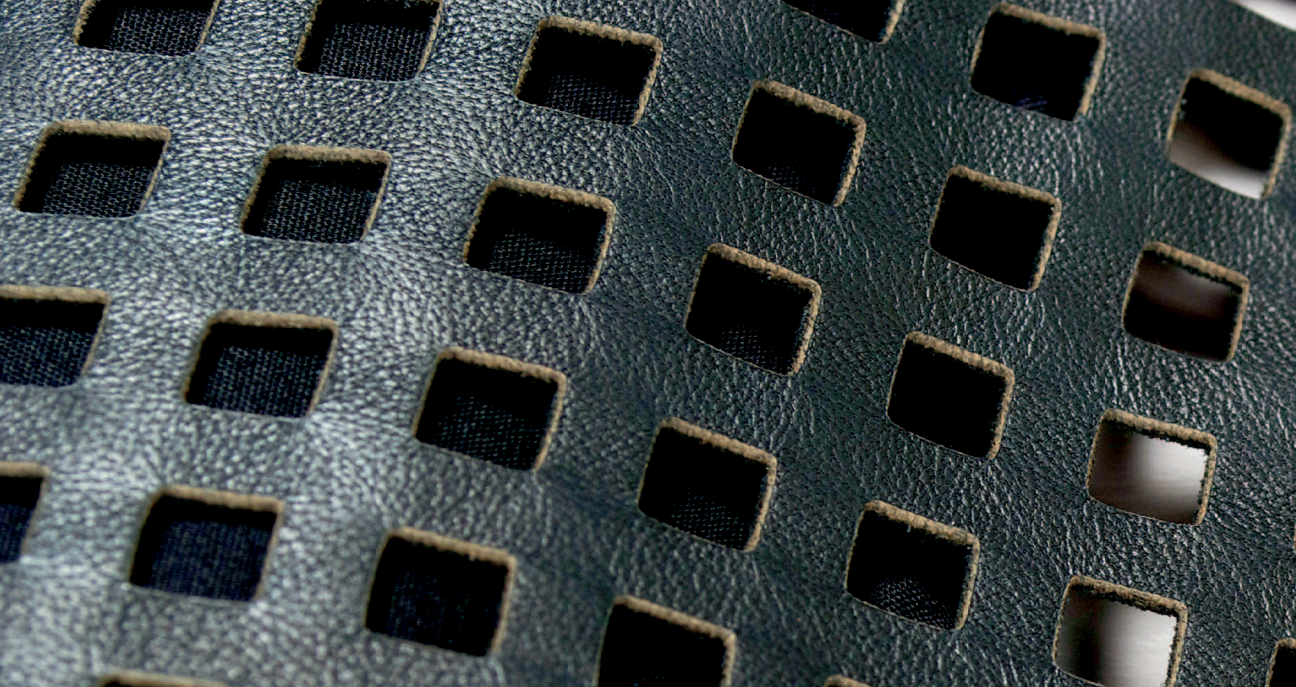
[simonthorogood.com](http://simonthorogood.com)  
[fashiondigitalstudio.com](http://fashiondigitalstudio.com)

Courtesy of Simon Thorogood



GENERATIVE TECHNOLOGY





TECHNOLOGY + EXPRESSION







The intersection of technology and design can be seen in two ways in this section of the exhibition. Firstly, fashion designers utilize technology to create new and exciting aesthetic possibilities. Secondly, designers use our cultural feelings about technology as a source of inspiration. In either case the examples go beyond our traditional conceptions of beauty and identity.





## Nine Molds for Pressedleathershoe, 2011

Dutch designer Marloes ten Bhömer's designs exemplify a new aesthetic through the structural possibilities created by blending non-traditional technologies and materials. Her shoes take their origins from traditional production principles despite the fact that they are, in fact, slowly developed, manufactured and are created as luxury items.

*Pressedleathershoe* is produced utilizing a multi-step leather forming production technique. The leather is soaked in water for greater elasticity and then pressed between a two-part mold to form the 3D shape. *Pressedleathershoe* is pressed from 3 pieces of pre-formed leather.

[marloestenbhomer.com](http://marloestenbhomer.com)

Material tests, mold parts, vacuum formed parts, design tests and final shoe; plastic and leather  
On loan from Marloes ten Bhömer, L2013.12.3 a-j

## Rotationalmouldedshoe, 2009

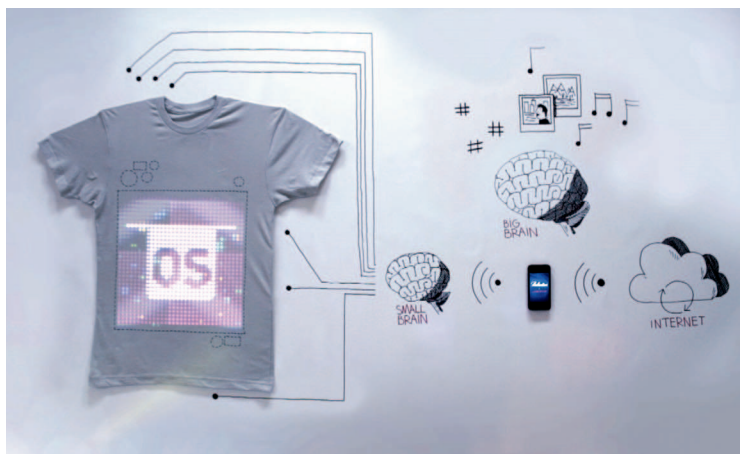
*Rotationalmouldedshoe* is made via rotational molding, a process in which a negative mold is filled with a small amount of liquid and as the mold rotates the liquid solidifies against the inner walls of the mold. The shoe is formed from this solidified hollow shell.



Photo: Marloes ten Bhömer

Polyurethane rubber and  
stainless steel  
On loan from Marloes ten Bhömer,  
L2013.12.4





Photos: CuteCircuit

## tshirtOS, 2012

CuteCircuit, based in London, created the very first programmable t-shirt. The work showcased in the video, *tshirtOS*, has a 32 x 32 RGB LED matrix (a 1,024 LED screen) embedded into the fabric that can display images or videos. The video shows how the t-shirt is controlled via an application on a smart phone.

## Pink and Black Collection, 2013

CuteCircuit's *Pink and Black Collection* Dresses are designed by Francesca Rosella. The dresses are made of silk chiffon and organza that are hand embroidered with hundreds of Swarovski crystals. The Haute-Couture dresses are controlled via an iPhone App 'Q' that counts tweets and changes the dress color.

[cutecircuit.com](http://cutecircuit.com)

Video courtesy of Marina Delgrano



## Eclipse, 2011-2013

Diffus Design, a Copenhagen design firm founded by Michel Guglielmi and Hanne-Louise Johannesen, combines traditional and codified production processes to create 'soft' technologies with complex materials. *Eclipse* utilizes embroidered solar sequins made of photovoltaic material and monocrystalline silicon to harvest enough sunlight to charge a mobile device or light up the purse's interior in the evening via its lithium ion battery.

*Eclipse* - The Solar Handbag is designed and developed by Diffus Design (DK) in a collaboration with the embroidery company Forster Rohner AG (CH), Die Interstaatliche Hochschule für Technik Buchs (CH) and Alexandra Institute (DK).

[diffus.dk](http://diffus.dk)

Solar Cells embroidered purse,  
Lithium Ion battery  
On loan from Diffus Design, L2013.6.1

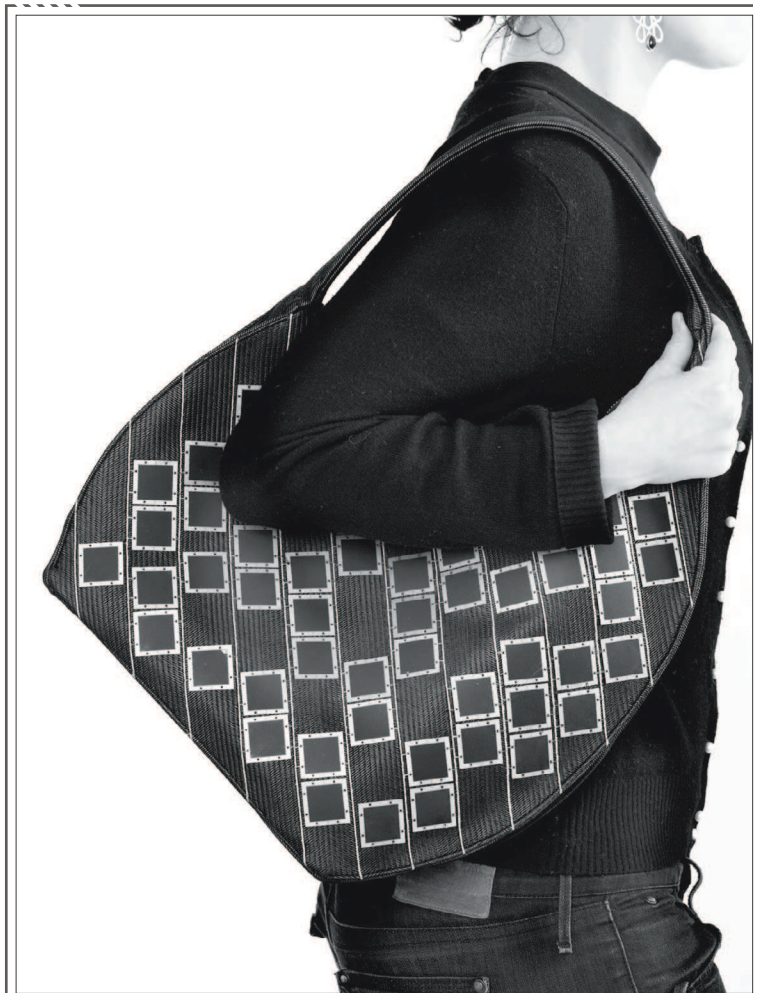


Photo: Diffus Design

TECHNOLOGY + EXPRESSION



## Walking City Dress 1, 2006

Ying Gao is a fashion designer and professor at the École Supérieure de Mode, Université du Québec à Montréal (UQAM). The exhibition video shows how the garments move slowly as if breathing. The fabric reacts to external stimulus via sensors and a pneumatic mechanism. *Walking City Dress 1* is hypersensitive to the viewer's presence via a motion sensor while *Walking City Dress 2* inflates if breath is detected via a microphone.

[yinggao.ca](http://yinggao.ca)

Nylon and cotton  
On loan from Ying Gao, L2013.7.1

## Future Matter, 2012

In 2010, Montreal artist-designer Valérie Lamontagne founded 3electromode, a wearable electronics atelier dedicated to avant-garde crafting and consulting in fashionable technologies. *Future Matter*, a collaboration between 3electromode's Valérie Lamontagne and Eugenia, consists of two hand-woven cotton dresses with digitally printed silk underlayers that indicates the placement of the electronics (as seen in the poster in the exhibition). The dresses utilize a Lilypad Arduino and motion sensor to animate the embroidered Light Emitting Diodes (LEDs).

valerielamontagne.com  
3electromode.com

On loan from Valérie Lamontagne,  
L2013.5.1-4



Photo credit: Jamie Lablanc

TECHNOLOGY + EXPRESSION



photo credit: Lacoste



## Zaha Hadid Footwear for Lacoste, 2009

## Melissa Shoes, 2008

Zaha Hadid is an Iraqi-British Architect (Pritzker Architecture Prize 2004) whose distinct radical, fluid spaces would be impossible without the advent of CAD (computer-aided design) and digital fabrication techniques which give her almost infinite freedom to create her signature aesthetic of curving and fragmented geometry. Brazilian eco shoe company Melissa collaborated with Hadid to create a plastic molded shoe with her distinctive “fragmented geometry” style. Hadid’s collaboration with Lacoste used dynamic fluid grids to create limited edition leather shoes that appear to defy gravity.

[zaha-hadid.com](http://zaha-hadid.com)

Diffusion Edition, Blue Leather Shoe, 2009  
Ladies Limited Edition, Purple Leather Boots.  
2009 On Loan from Zaha Hadid, L2013.19.1ab,  
L2013.19.2ab

Purple Shoe, 2008  
Injection Molded Plastic,  
Anonymous Loan, L2013.15.6ab



# Light Blue Luminex Dress with White LEDs, 2009

Anke Loh is a practicing fashion designer and Chair (Associate Professor) of the Fashion Department at the School of the Art Institute of Chicago. Loh's *Luminex Dresses* emit light in response to sound, temperature and other stimuli. She collaborated with Luminex, Inc. (Italy/Miami) to create these garments from glowing optical fiber fabrics.

[aneloh.net](http://aneloh.net)

LEDs and Luminex fabric  
On loan from Anke Loh, L2013.11.1



TECHNOLOGY + EXPRESSION



## LED Necklace, 2013

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Anke Loh's design practice is focused on blending fashion with the latest technology and forging relationships to make her designs a reality. Loh is currently working with the Fraunhofer Institute in Berlin to develop stretchable circuitry. The LED necklace showcased in the exhibition is a result of this collaboration.

aneloh.net

On loan from Anke Loh, L2013.11.3

McQ by Alexander McQueen Black Lattice Lasercut Dress, S/S 2012

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The late Alexander McQueen utilized a wide variety of technological tools to create awe-inspiring fashion at the greatest level of creativity. McQueen's name was synonymous with the sublime integration of technology in his fashion designs as well as his technology-infused, theatrical fashion shows. This simple McQ dress is perforated using a laser cut lattice pattern that gives the already supple leather a feeling of movement and grace.

[alexandermcqueen.com](http://alexandermcqueen.com)

100% lambs leather  
Lining: 97% cotton, 3% Lycra  
Anonymous Loan, L2013.15.5



TECHNOLOGY + EXPRESSION

NIKE



Photo credit: Nike

## Flyknit Trainer+, 2013

On the surface the Nike *Flyknit Trainer+* shoe looks like any other athletic shoe with high tech aesthetics. By utilizing engineering and proprietary technology, Nike designed the toe box, upper and heel counter of the running shoe in one almost-seamless piece that is knit out of polyester yarn. The result of Flyknit technology is the dramatic reduction in the weight of the running shoe and decreased waste in the manufacturing process. Additionally, the shoe is formfitting like a “second skin.”

[nike.com](http://nike.com)

Waffleskin rubber outsole, nylon fibers,  
and polyester yarn  
L2013.37.3ab

TECHNOLOGY + EXPRESSION



## Fly Heels, 2011

## Split Heels, 2013

Formally trained as an architect, Oknyansky has transformed his knowledge of physics, engineering and aesthetic considerations to create shoes that utilize made-to-order techniques combined with computer aided manufacturing (CAM) technologies. The *Born Again* Collection's *Split Heels* were created using bioplastic 3D printing technology. The *Fly Heels* were created via 5-axis CNC milling.

[shoesbybryan.com](http://shoesbybryan.com)

Plywood + Leather  
PLA Plastic + Leather  
On loan from Bryan Oknyansky, M. Arch.,  
Founder, Shoes By Bryan, L2013.14.1ab,  
L2013.14.3ab



TECHNOLOGY + EXPRESSION



Ankle Boot,  
This Will Destroy  
You, *Lost  
Civilizations*  
F/W 2012

Pump, *Kinetic*, 2011

Montreal designer Anastasia Radevich's work has an anti-utopian aesthetic, yet is powerful in its crafted beauty and grandeur. Radevich uses 3D printing processes that allow for her radical design choices. *Kinetic* looks as though the shoe's sculpted heel is in motion. *Lost Civilizations* features unusual concepts like comprising the wedge and platform of three-dimensional letters in order to communicate a message.

[anastasiaradevich.com](http://anastasiaradevich.com)

Metal Heel + Platform  
3D Printed Platform,  
Digitally Printed Textile  
On loan from Anastasia Radevich,  
L2013.2.2, L2013.2.1

## Nuue Collection, 2011

Designer Jung Eun Lee, founder of Studio Koya, experiments and researches unconventional methods of creating garments. The pieces in the *NUUE* collection are made by wrapping synthetic fibers around a wooden mold and then pressure heating the materials until they fuse together. The three-dimensional, resulting garment is amazingly pliable and soft.

[studiokoya.com](http://studiokoya.com)

Synthetic fiber dress  
On loan from Jung Eun Lee,  
L2013.3.1



TECHNOLOGY + EXPRESSION



Photo: Studio Roosegaarde

## Intimacy White, 2009

Daan Roosegaarde is an artist, architect and the creative director of Studio Roosegaarde, a lab that creates interactive artworks. His work explores the relationships between architecture, the human body and new media. The *Intimacy White* dress is made with wireless interactive technologies, LEDs and smartfoils that change their levels of transparency the closer a viewer gets to the dress.

*Intimacy White* was developed by Daan Roosegaarde, Institute for Unstable Media's V2\_Lab (Simon de Bakker, Stan Wannet, Piem Wirtz), Fashion Designer Maartje Dijkstra and the team of Studio Roosegaarde (Peter de Man, Joao Carneiro).

[studioroosegaarde.net](http://studioroosegaarde.net)

Smartfoils, LEDs,  
Electronic Sensor and Circuit  
On loan from Studio Roosegaarde,  
L2013.4.1



## Grid VIII, The Iteration, 2012

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The *Iteration* Collection by Russian designer Lisa Shahno is inspired by the Fractal Cosmology Theory. The central issue to this theory is that the universe may consist of an infinite number of levels, which are similar to each other but different in scale. Garments of the collection represent a variety of matter levels in the universe. All of the pieces' patterns are composed of the one repeating basic element – the square divided by diagonals – an elementary particle. Each garment has a different scale and a different number of elementary particles involved.

lisashahno.com

137x40 centimeters of wool
with polyester
On loan from Lisa Shahno, L2013.17.1



TECHNOLOGY + EXPRESSION



'Madame Butterfly' Jacket with Peacock Appliqué, 2011

Founded in 2008, SquidLondon consists of two college friends from the London College of Fashion. Viviane Jaeger and Emma-Jayne Parkes use hydrochromatic inks that begin to change color when wet. Their first product was the *Squidrella*, 'Paint Drip,' an umbrella commissioned by the Tate, that was inspired by Jackson Pollack paintings. The *Opera Icons* Collection collaboration consists of three rainwear coats designed and constructed by Vlasta Collu (bespoke designer, couturier and milliner at Vlasta Collu) and the color changing appliqués sewn by Charlotte La Roche (bespoke senior embroidery designer at Oscar de la Renta).

squidlondon.com

Thin dragon coated polyester. Sourced; Mectex, Como, Italy. With a leather suede trim, London sourced
On loan from SquidLondon, L2013.9.2

Black Dress, S/S 2013

Stoll Fashion & Technology, an international company originating in Germany, established individual centers of design and manufacturing in the fashion capitals of the world. The designs in the exhibition showcase the cutting edge knitwear designs that Stoll knitting machines can produce. The technical expertise of the company allows for knit design to have a stunning new variety of possibilities and the small batch production helps to create new, more sustainable possibilities for local production.

stoll.com

Colcotton: a finely spun cotton
On loan from Stoll Fashion &
Technology, L2012.10.3



BALENCIAGA BY NICOLAS GHESQUIERE (FRENCH)

SPRING/SUMMER 2007

SPRING/SUMMER 2009

Throughout his time at Balenciaga, Ghesquiere took advantage of the Fashion House's ability to commission the latest in fabrications. He explored futurism, society's fascination with technology and the relationship with the human form. Nicholas Ghesquiere is a huge science fiction fan, referencing three classic sci-fi movies, *Star Wars*, *Mad Max* and *Tron* within these two fashion shows.

HUSSEIN CHALAYAN (BRITISH OF TURKISH DESCENT)

AUTUMN/WINTER 2007 *Airborne*

SPRING/SUMMER 2007 *One Hundred and Eleven*

SPRING/SUMMER 2009 *Inertia*

Chalayan's work centers on time and place and our relationship to the world around us. AUTUMN/WINTER 2007 *Airborne* employs LEDs and mechanized shapes to create new surfaces and shapes to a dress. SPRING/SUMMER 2007 *One Hundred and Eleven* utilizes state-of-the-art technology to create dresses that literally move from one fashion era to the next. SPRING/SUMMER 2009 *Inertia* utilizes digital prints and molded latex to examine the fast paced chaotic world we live in.

IRIS VAN HERPEN (DUTCH)

AUTUMN/WINTER 2013 *Wilderness Embedded*

SPRING/SUMMER 2013 *Voltage Haute Couture*

SPRING/SUMMER 2012 *S/S Micro*

AUTUMN/WINTER 2011 *Capriole*

AUTUMN/WINTER 2010 *Crystallization*

SPRING/SUMMER 2010 *Synesthesia*

Iris van Herpen is interested in the connection between art and technology. She creates pieces that can be considered art for their considerable aesthetic and cultural impact. She is uninterested in mainstream fashion, but in abstracted ideas that require a human form to accurately communicate. Iris van Herpen achieves her awe-inspiring, fantastic pieces through collaborations with artists, designers, technologists, and engineers. She designs and executes her pieces with the use of computer aided design and manufacturing technologies.

ALEXANDER MCQUEEN (BRITISH)

SPRING/SUMMER 2009 *Natural Distinction Unnatural Selection*

SPRING/SUMMER 2010 *Plato's Atlantis*

In these two presentations Alexander McQueen juxtaposed the natural world with the technological world, creating a narrative that suggested a battle of dominance. Utilizing stunningly complex digital prints as well as fabrications that look technological, McQueen created a tense futuristic scenario that questions our relationship with the world we have created.

ISSEY MIYAKE (JAPANESE)

132.5

Issey Miyake is a designer with a long, illustrious career of breaking rules, and creating innovative, aesthetically pleasing fashion while continually pioneering new applications of technology. Miyake retired from designing his primary fashion collections in order to concentrate on research and experimentation of new craft techniques and technology. The *132.5* collection is a result of Miyake's recent research and collaboration with computer scientist and origami master, Jun Mitani. The proprietary technology of *132.5* employs a complex set of algorithms. A multiple-step process creates a garment that transforms from a 2D flat shape to a 3D form. Recycled materials are pleated and then opened creating beautiful, interesting and wearable clothing.

VIKTOR & ROLF (DUTCH)

AUTUMN/WINTER 2002 *Long Live the Immaterial*

SPRING/SUMMER 2010 *Budget Cut Couture*

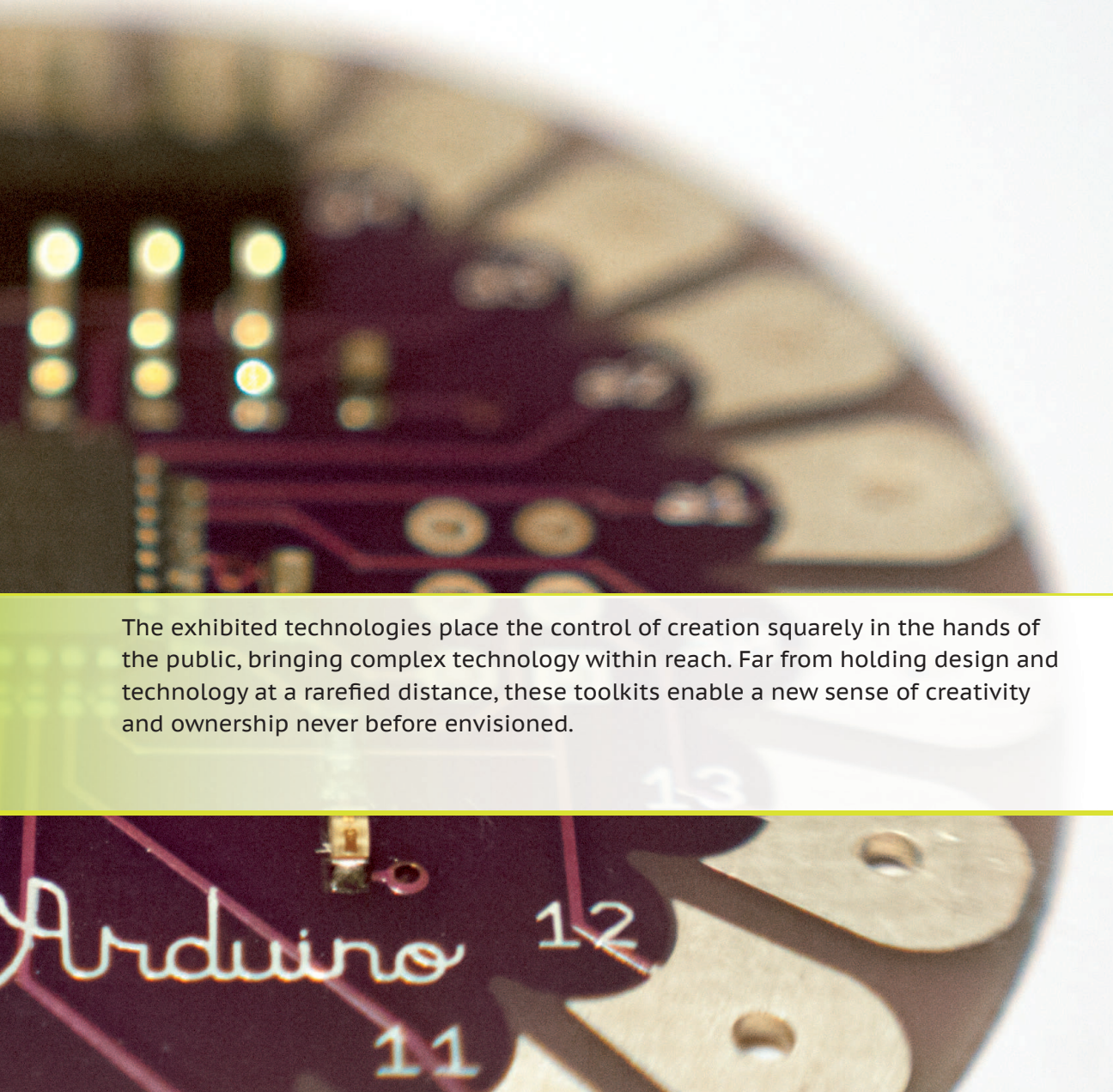
Viktor & Rolf have created a highly conceptual brand that is focused on our individual relationship with clothing. *Long Live the Immaterial* utilized photochromic ink (the blue fabric), which is usually used in movie special effects in "green-screening." During the fashion show, this material created the illusion of a model becoming disembodied or in some cases their body seemed to disappear altogether. *Budget Cut Couture* utilizes vast amounts of tulle to create entirely new body forms. This is a reference to many women's use of fashion to appear more powerful or physically dominating.

TECHNOLOGY + EXPRESSION RUNWAY SHOWS

A close-up photograph of a LilyPad microcontroller board. The board is dark green with visible copper traces and components. A bright green horizontal banner is overlaid across the middle of the image. The text "D.I.Y. (DO IT YOURSELF)" is written in a black, monospaced font on the banner. Below the banner, the word "LilyPad" is printed in a white, cursive font on the board's surface. To the left of the text, there are two circular holes in the board, and a small component is visible in the background.

D.I.Y. (DO IT YOURSELF)

LilyPad

A close-up photograph of an Arduino Uno microcontroller board. The board is dark green with visible copper traces and components. A semi-transparent yellow rectangular box is overlaid on the center of the image, containing text. In the background, the circular shape of the board is visible, with some components and traces out of focus. The text inside the box discusses the accessibility of technology to the public.

The exhibited technologies place the control of creation squarely in the hands of the public, bringing complex technology within reach. Far from holding design and technology at a rarefied distance, these toolkits enable a new sense of creativity and ownership never before envisioned.



OTTO VON BUSCH



Fashion Fianchettos, 2009

Swedish fashion theorist, artist, designer and self-proclaimed “Fashion Hacktivist,” Otto von Busch regularly holds workshops and gives lectures centered on the many possibilities of DIY creation. *Fashion Fianchettos* takes its name from a tactical move in chess. Busch aims to reprogram clothes by utilizing an oversized t-shirt with a grid (hardware) and creating draping codes (software) that can be easily reproduced through a simple set of instructions. The basic commands used in Fianchetto programming are: garment(type), grid(size), wear(normal, upsidedown) and connect(coordinates).

selfpassage.org

T-shirt, inkjet prints and zines
Courtesy of Otto von Busch

D.I.Y. (DO IT YOURSELF)

Shrooms, 2012

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Karen Hong, Assistant Professor from Singapore's Nanyang Technological University's School of Art, Design and Media, specialized in Fashion Textiles at Central St. Martins College of Arts and Design. Her current research explores mixing new technologies and textiles to create 'tactile textiles.' The *Shrooms* pillow integrates soft circuits utilizing heat set textiles to create beautiful pillows that interact with touch.

[tactiletextiles.com](http://tactiletextiles.com)

LED embedded cushion – 16 x 16 inches  
L2013.37.4



D.I.Y. (DO IT YOURSELF)



## Eight Steps 2010

The two art technologists Mika Satomi and Hannah Perner-Wilson created KOBAKANT in 2008 to explore the intersection of craft and technology by creating e-textile and wearable technology projects. *Eight Steps* is based on workshops where participants were asked to create musical instrument garments by combining sound toys and textile sensors. Each t-shirt represents one step in the process of creating a wearable instrument, and the table showcases the items that were utilized in the process.

[kobakant.at](http://kobakant.at)

On loan from KOBAKANT, L2013.16.1

D.I.Y. (DO IT YOURSELF)

## HOW TO GET WHAT YOU WANT

KOBAKANT's Mika Satomi and Hannah Perner-Wilson have compiled an incredibly thorough online resource directory for all things related to DIY wearable technology. There are tutorials on how to create sensors, material tests and specifications, information on different electronic components, and much, much more.

[kobakant.at/DIY/](http://kobakant.at/DIY/)



### EXAMPLE PROJECTS

#### WORKSHOPS

#### ACTUATORS

#### CONNECTIONS

#### POWER

#### SENSORS

#### TRACES

#### CIRCUITS AND CODE

#### WIRELESS

#### CONDUCTIVE

#### MATERIALS

#### NON-CONDUCTIVE

#### MATERIALS

#### TOOLS

#### TECHNIQUES

### EXAMPLE PROJECTS

#### ALUMINUM FOIL TILT SENSOR

#### AMPLIFIED PILLOW SPEAKER

#### BEADED TILT SENSOR SWITCH

#### DATA LOGGING BROADCH

#### DJ HOODIE

#### DRESSCODE EXAMPLES

#### EEONTEXT PROJECTS

#### FABRIC JOYPAD

#### GRANNY SQUARE MIDI

#### JOYSLIPPERS

#### MASSAGE MY FEET

#### MULTI-TOUCH PILLOW

#### MUSICAL PILLOW

#### NEOPRENE LED LIGHT POUCH

#### OPENWEAR FINGER BEND SENSOR

#### PIANO T-SHIRT

#### CAPACITIVE LED POWER

#### PUPPETEER COSTUME

#### PUPPETEER GLOVES

#### SENSITIVE FINGERTIPS

#### SENSOR SLEEVE

#### SILENT PILLOW SPEAKER

## WELCOME TO THE KOBAKANT DIY WEARABLE TECHNOLOGY DOCUMENTATION

*This website aims to be a comprehensible, accessible and maintainable reference resource, as well as a basis for further exploration and contribution.*

## MOST RECENT POSTS

### Example Projects

## EEONTEXT PROJECTS



This post compiles a list of projects for e-textile designs and sensors that make use of the Eeontex range of coated conductive fabrics produced by Eeonyx. Eeontex fabrics are fabrics coated/doped with an inherently conductive polymer, making them conductive with quite a high resistance. But the resistance changes of distance, pressure through the material, and [...]

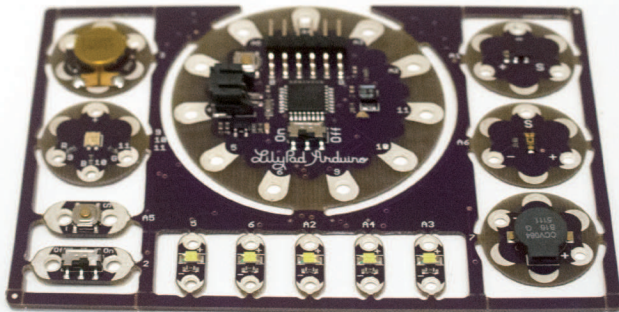
### Workshops

## TRACES WITH ORIGIN

h

September 2013, TinkerLab at the Schmiede Festival in Hallein bei Salzburg/Austria Have you

D.I.Y. (DO IT YOURSELF)



## LilyPad Arduino, 2007

*LilyPad* is a set of electronic pieces designed to be sewn to fabric in order to build soft, interactive textiles. The set of electronic modules—including a small programmable computer called a *LilyPad Arduino* and an assortment of other components like sensors, lights, and motors—can be stitched together with conductive thread to create dynamic and interactive garments and accessories. *LilyPad* was designed and developed by Leah Buechley, the director of the MIT Media Lab High-Low Tech Research Group and SparkFun Electronics. The *ProtoSnap* is an all-in-one circuit board containing a pre-wired *LilyPad Arduino* (with attached components) that comes ready for experimenting and prototyping. Once coding is finished, the parts easily snap apart for use in a permanent project. *LilyPad ProtoSnap* (pictured) is available at [sparkfun.com](http://sparkfun.com).

[lilypadarduino.org](http://lilypadarduino.org)



## High-Low Tech Research Group

The MIT Media Lab High/Low Tech Research Group works on the exploration of high and low technologies through the integration of computation, materiality, and cultural contexts. Leah Buechley, the designer and developer of the *LilyPad Arduino* is the director of this group and their website is a wonderful resource.

[hlt.media.mit.edu](http://hlt.media.mit.edu)

## Arduino, 2005

*Arduino* is an open source electronics prototyping platform that consists of both software and hardware. The project was started in 2005 at the Design Institute of Ivrea as an inexpensive electronics board for students to use to create interactive art with. Both the software and hardware are easy to use. There are many different type of *Arduino* boards for different applications.

[arduino.cc](http://arduino.cc)

## HIGH-LOW TECH RESEARCH GROUP-MIT MEDIA LAB

high-low tech



PROJECTS  
PEOPLE  
PUBLICATIONS

TUTORIALS  
MATERIALS  
NEWS & EVENTS  
WORKSHOPS  
MIT CLASSES  
ADMISSIONS  
NEWSLETTER

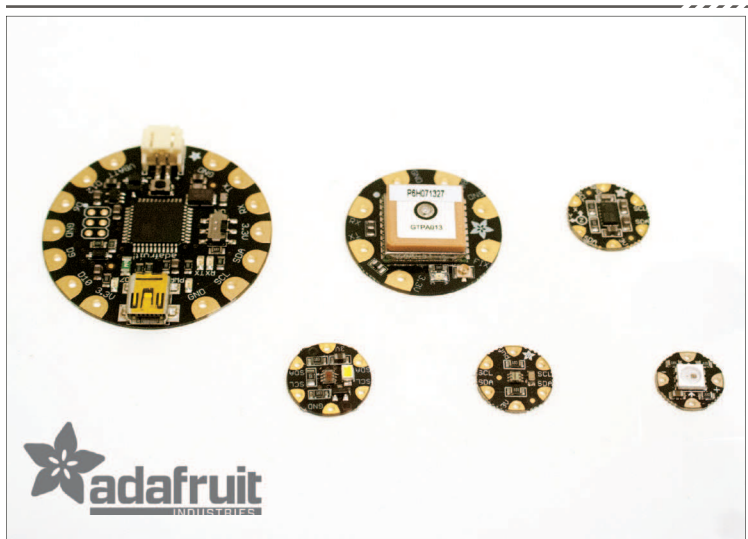
High-Low Tech, a research group at the MIT Media Lab, integrates high and low technological materials, processes, and cultures. Our primary aim is to engage diverse audiences in designing and building their own technologies by situating computation in new cultural and material contexts, and by developing tools that democratize engineering. We believe that the future of technology will be largely determined by end-users who will design, build, and hack their own devices, and our goal is to inspire, shape, support, and study these communities. To this end, we explore the intersection of computation, physical materials, manufacturing processes, traditional crafts, and design.

ARDUINO



D.I.Y. (DO IT YOURSELF)

ADAFRUIT



MAKE

**Make:**  
makezine.com

D.I.Y. (DO IT YOURSELF)

## FLORA, 2012

Limor “Ladyada” Fried founded Adafruit in 2005. Adafruit, com has become a center for learning electronics and finding well-designed electronics like FLORA, a microcontroller toolkit and sensors that can be easily integrated into textiles and garments. Fried was the first female engineer to be featured on the cover of WIRED due to her success and involvement with electronics in the Open Hardware market.

[adafruit.com](http://adafruit.com)

## MAKE, 2005

MAKE is an American quarterly magazine founded by Dale Dougherty and published by Maker Media, Inc. The magazine features projects from different disciplines that are DIY and DIWO (do it with others). Makezine.com is the online version of the magazine featuring tutorials, forums and blog posts on all kinds of DIY projects.

[makezine.com](http://makezine.com)

## openwear, 2010

Openwear is an online community created to help foster collaborations between makers, fashion designers, manufacturers, and small businesses. Open-source fashion creations and collections are published on the site and these designs are downloadable, customizable, producible, and sellable by any individual who wishes to do so under an open source brand.

[openwear.org](http://openwear.org)

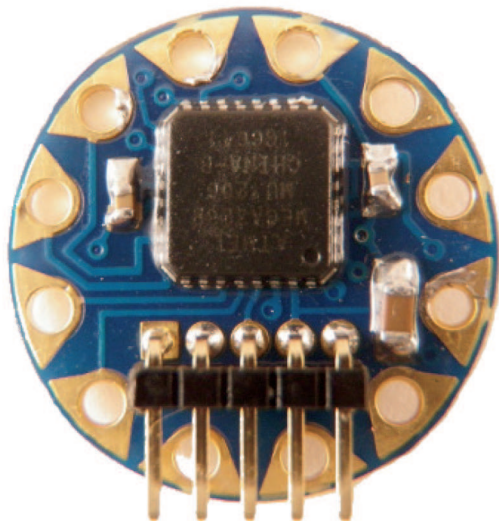


## Ponoko, 2007

The Ponoko website makes it easy for anyone to make, share, sell and buy products. Ponoko offers laser-cutting, 3D printing and CNC routing services in New Zealand, the USA and Europe. It also has an electronics catalog supplied by SparkFun and their Personal Factory API which allows for designers to make their own online product creation apps.

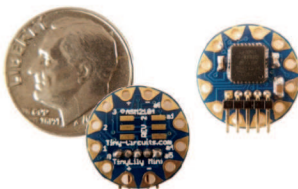
[ponoko.com](http://ponoko.com)





## TinyLily

1/12th the Size of a LilyPad Arduino,  
but with all the Power!



Photos by TinyCircuits

## TinyLily Mini Processor, 2012

TinyCircuits was founded by Ken Burns in Akron, OH in 2011 and had a very successful kickstarter.com campaign in 2012. Ken's passion is developing cheap and easy to use tiny microcontroller and sensor boards. TinyCircuits' Arduino-based open-source hardware *TinyLily* modules lend themselves to wearable computing projects due to their small size.

[tiny-circuits.com](http://tiny-circuits.com)

On loan from TinyCircuits, L2013.29.1



## Guilloche Necklace, 2013

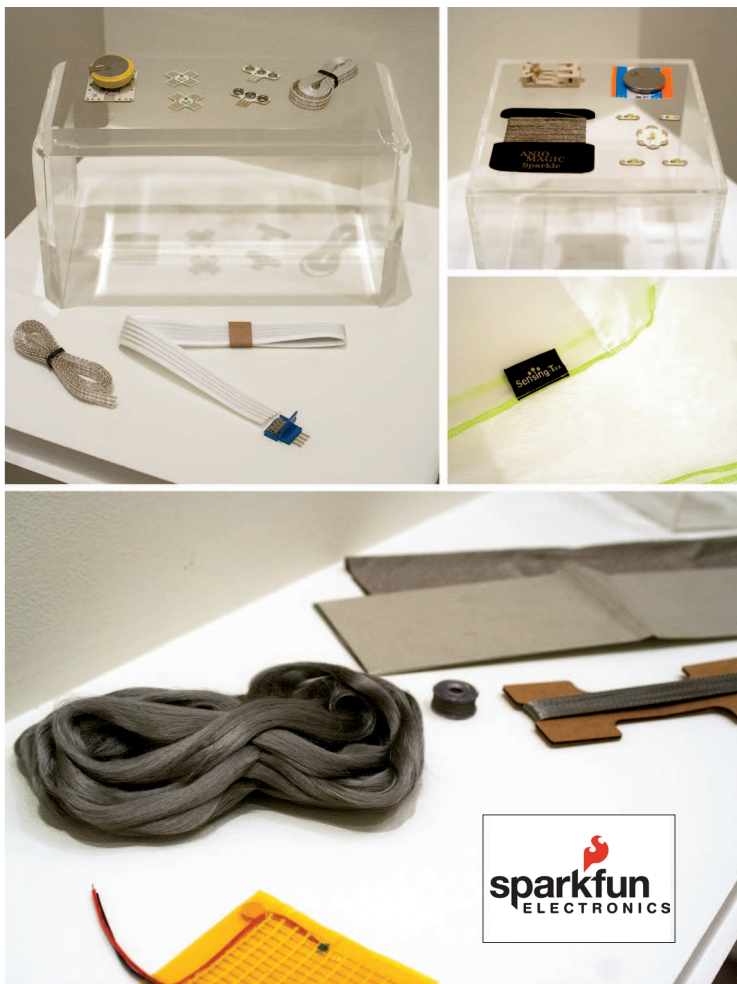
Shapeways, a spinoff of Royal Philips Electronics, is an international 3D printing marketplace and community that began in the Netherlands in 2007. The Shapeways website allows for individuals to make, buy and offer their own 3D printed products for sale. Shapeways gives users access to cutting edge 3D printing technology in a variety of materials such as plastic, ceramic, stainless steel, sterling silver and gold plated brass.

[shapeways.com](http://shapeways.com)

*Guilloche Necklace* by Alienology  
Black Strong & Flexible  
On loan from Shapeways, L2013.34.5



D.I.Y. (DO IT YOURSELF)



## Fabrikit Brickit, 2013

## Aniomagic, Sparkle Kit, 2013

## SensingTex Fiber Optic Fabric, 2013

SparkFun Electronics is an online retail store that sells the bits and pieces to make electronics projects possible. Their open source ideology on these products and resources makes the world of electronics more accessible to the average person. SparkFun provides tools, hardware, and educational resources for individuals that want to learn how to work with electronics. One of the rather innovative products Sparkfun developed is the *LilyPad Arduino ProtoSnap* (see *LilyPad Arduino*). Bottom photo: conductive threads, roving, fabrics, and heatpad.

[sparkfun.com](http://sparkfun.com)

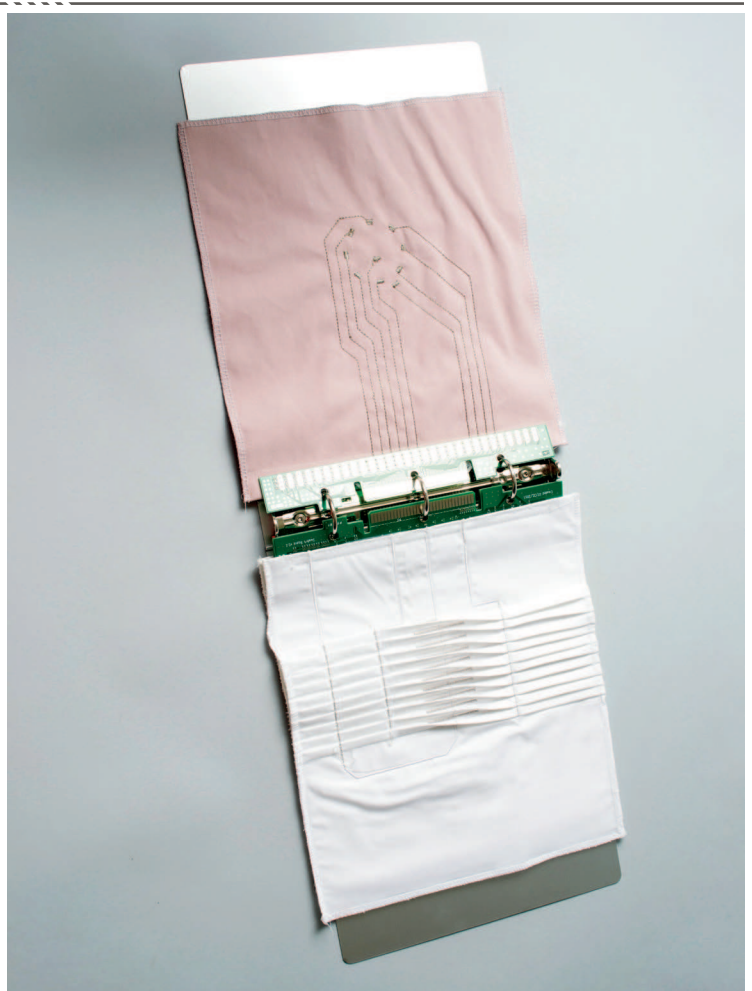
Anonymous Loan: Fabrikit Brickit L2013.37.20 a-h, Sparkle Kit L2013.37.19 a-j, Conductive Fabrics and Threads L2013.37.11-12, L2013.37.14, L2013.37.16, L2013.37.17.

## Electronic Textile Interface Swatch Book, 2010

The *Electronic Textile Interface Swatch Book*, developed by Clint Zeagler and his Georgia Institute of Technology colleagues, Scott Gilliland and Thad Starner, explores fabric graphical user interfaces (GUIs) by using traditional machine embroidery and conductive thread. The book was designed to serve as a reference tool for designers in the integration of intuitive tactile interfaces with clothing or soft products. The embroidered swatches showcased are: the pleat interface, the jog wheel interface (traditionally seen on early generation iPods as the one in the display case), the menu interface and the rocker interface.

[clintzeagler.com](http://clintzeagler.com)

Embroidered textile swatches,  
conductive thread, portfolio cases and  
custom electronics.  
On loan from Clint Zeagler, L2013.10.1



D.I.Y. (DO IT YOURSELF)



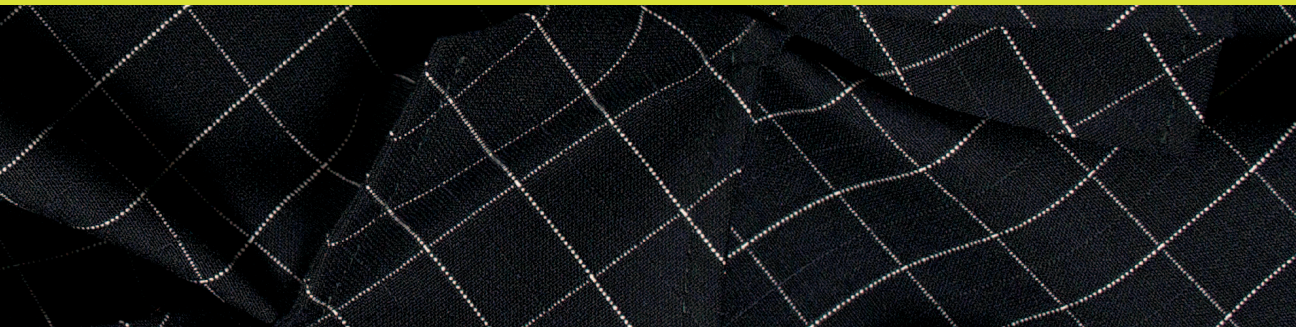


DEMOCRACY OF PREFERENCE

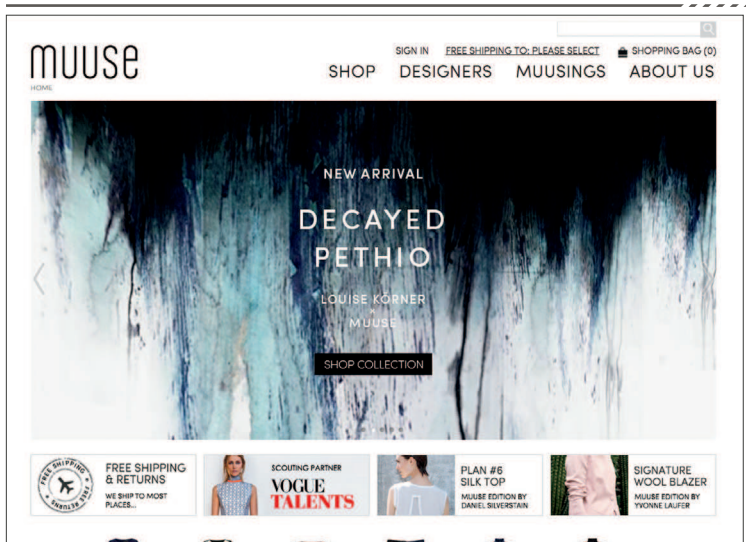




Imagine a fashion industry that provides one-of-a-kind products whenever you shop. Imagine helping to design a garment that is professionally made but which is specific to your tastes and aesthetic. Imagine supporting a new young designer with exciting fresh ideas. Co-creation tools and mass customization websites are making these ideas a reality.



MOUSE

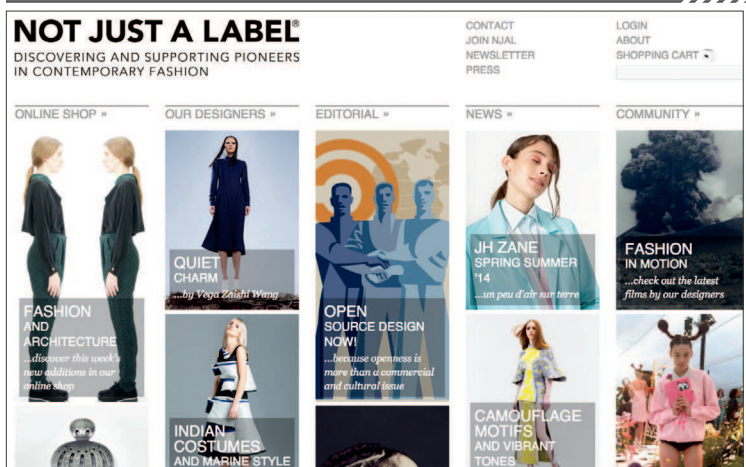


## MUUSE, 2011

Based in Copenhagen, MUUSE is an international fashion label with an online presence. The label engages young entrepreneurial designers to create small collections and helps to manufacture small runs (1 to 100) and then distributes their work online. For consumers, it allows a greater sense of individuality and unique options for clothing and accessories.

muuse.com

NOTJUSTALABEL



## NOT JUST A LABEL, 2008

NJAL is an online business directory and networking service offering exposure to emerging designers and avant-garde fashion brands. Designers apply for membership which allows for the selling of their collections via the online store. By supporting emerging designers and labels, NJAL ensures the development of innovation and diversity.

notjustalabel.com

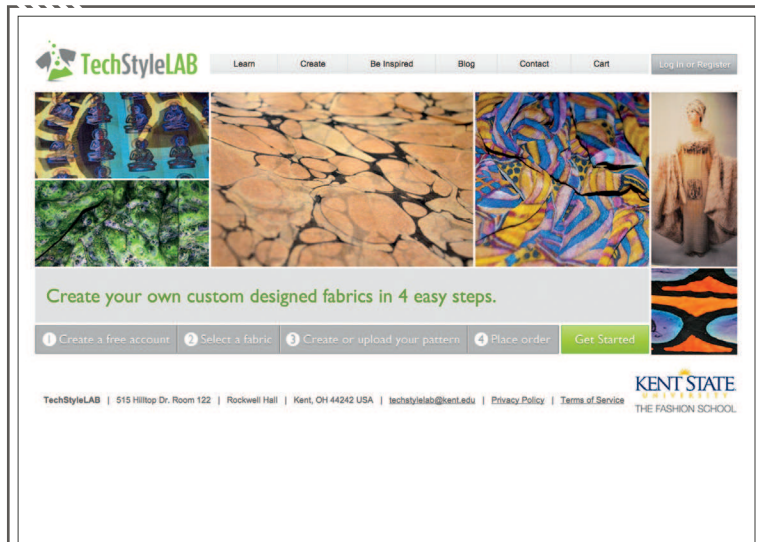
DEMOCRACY OF PREFERENCE



## TechStyleLAB, 2010

The TechStyleLAB at Kent State University is a creative research lab that serves fashion students, faculty and provides services to small businesses and the local community. The lab consists of high tech tools such as a laser cutter, digital textile printers, embroidery machines and digital input devices. The website gives access to digital textile printing via an online interface.

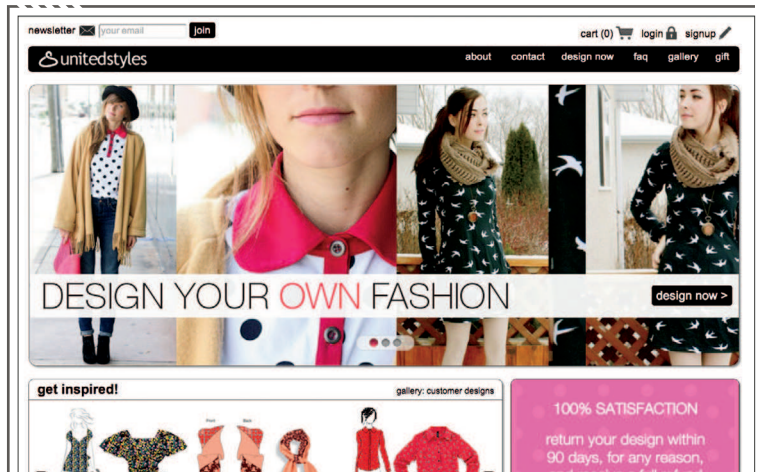
tech-style-lab.org



## Unitedstyles, 2011

Shanghai based Unitedstyles is a co-creation website which has a 'design' module for one to create unique garment based on a series of choices such as color, fabric, silhouettes and details. The product is constructed in China and delivered to the individual's home at an affordable price. This mass customization challenges the dominance of mass production in fashion.

unitedstyles.com



# SHIFTING PARADIGMS

FASHION  TECHNOLOGY

Visit the exhibition website at:  
[www.shiftingparadigmsksu.com](http://www.shiftingparadigmsksu.com)

Learn more about the Kent State University Museum at:  
[www.kent.edu/museum](http://www.kent.edu/museum)

Learn more about the Kent State University Fashion School at:  
[www.fashionschool.kent.edu](http://www.fashionschool.kent.edu)

  
KENT STATE  
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Photo: Studio Roosegaarde