Introduction to e-textiles

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e-Textiles

- Electronic textiles, also known as smart garments, smart clothing, smart textiles, or smart fabrics, are fabrics that enable digital components such as a battery and a light (including small computers), and electronics to be embedded in them. Smart textiles are fabrics that have been developed with new technologies that provide added value to the wearer.

- "What makes smart fabrics revolutionary is that they have the ability to do many things that traditional fabrics cannot, including communicate, transform, conduct energy and even grow" (Pailes-Friedman, 2017).

- Smart textiles can be broken into two different categories: aesthetic and performance enhancing.
Kimbow-
by Eef Lubbers and Malou Beemer

https://vimeo.com/129483770
ATTIRE
http://attire.ie
Dr. Becky Stewart: Sensing Movement with Textiles

Dr. Becky Stewart will be sharing some of her work in e-textiles that covers a range of applications and explorations. She works with e-textiles and signal processing to build interactive, body-centric wearable computing systems. These systems often incorporate performance, fashion, music and/or design.

Becky is a lecturer in the School of Electronic Engineering and Computer Science at Queen Mary University of London. She was recently awarded the Daphne Oram Award Lecture for Digital Innovation. Becky was the that ran workshops teaching
Amy Rainbow Winters
https://www.rainbowwinters.com
Bobbin-Lace with Conductive Inlay Thread
by: Marta Kazand, Barbara Scholz

Description: Bobbin-lace making started in the 16th-century in Italy. Back then the lace was made with gold and silver-wrapped threads or colored silks and linen threads to create rich and extravagant designs. Inspired by the historical lace making, this sample explores the possibilities of using this old technique today to create contemporary designs.

This sample is made using silver plated thread and cotton yarn, like they did in the 16th century. Additionally to pure visual pleasure this sample is functional for e-textiles use, e.g. for electrical circuits. The design can be developed and used as conductor or as a sensor.

Materials: 100% cotton thread (size 10), conductive thread (11/17 2ply)

Techniques: Bobbin-lace

Link: www.martakisand.com/blog/bobbin-lace-workshop

Reference: Historical laces of 16th century Italy
eSwatches
Maria Almena- Kimatica Studio
https://kimatica.net
The gloves
Emilie Giles
http://www.emiliegiles.co.uk
Maria Paneta – Sarotis
http://www.mariapaneta.com
The silicon wearable
Bushra Burge
http://www.bushrabra burge.com/
Bushra Burge

Lessons learned

- The garment aesthetics are much more important than I originally thought, they have to be central to the story.
- People will fill in the gaps, this is an intimate experience, there is inevitably agency
- It’s good to be able to develop the experience further as you get feedback, the piece is not a passive
- Find a place where you have access to hardware to see if it makes a difference and then buy the cheapest thing you can get away with
- This is a new genre, don’t be rigid in your story-telling..... be open to how people adopt or not. Take note and absorb the learnings into your new story.
- Keep going. Being scorned is part of the journey of trying something new.

www.bushraburge.com
Rachel Freire
https://www.rachelfreire.com
Kasia Molga
http://www.kasiamolga.net
Tsai Chu Huang
https://www.huangtsaichun.com
Sara Robertson and Sarah Taylor
Giordana Giache - Hybrid 2016
Passive smart textiles: only able to sense the environment/user, based on sensors;
Active smart textiles: reactive sensing to stimuli from the environment, integrating an actuator function and a sensing device;
Very smart textiles: able to sense, react and adapt their behavior to the given circumstances.
Materials

- Conductive Fibers
- Conductive Fabrics
- Conductive inks
- Conductive materials as sensors
  - Stretch sensors
  - Pressure sensors
  - Electrochemical sensors
- Textile Energy Harvesting and Portable Power Supply System
- Wearable Antenna
What about coding?

- Arduino, Lilypad, Microbit, AT tiny, Intel Edison
Kitronic

E-Textiles & Conductive Thread

GET YOUR HANDS BUSY WITH
E-TEXTILES & CONDUCTIVE THREAD

Our E-Textiles components and resources are great for creating soft circuits, wearables and merging electronics with textiles.

Our E-Textiles range includes our very own Electro-Fashion® branded parts, which are designed and manufactured by Kitronik in the U.K. We stock conductive thread (or yarn), E-Textiles components (including power boards, switches and LEDs), a wide range of starter kits, as well as a range of LilyPad programmable E-Textiles products.

Need inspiration? See our wide range of E-Textiles tutorials and resources to help you get started.
Inspiration: Kobakant.at

- Hannah Perner-Wilson and Mika Satomi
- Based in Berlin
- Their website has plenty of advice and tutorials
Codasign.com

- Tutorials, suppliers
Local groups

- eStitches London – V&A
- eStitches Bristol
- Lovelace Dublin – lovespace.com
eTextile Swatch Exchange

Where there is a Whug there

Vibrating speaker

Bits & Boobs

3D Printed Conductive Snap

Tube Yarn Story Circuit

Alive
eTextile spring break
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textile-academy.org
About Fabricademy

Fabricademy is a transdisciplinary course that focuses on the development of new technologies applied in the textile industry, in its broad range of applications, from the fashion industry and the upcoming wearable market. The two phase program will last 6 months, with approximately 3 months of seminars and learning modules and three months focusing on individual in depth applied project research.

http://textile-academy.org/
Future Textiles Lab

Follow us on Facebook!
Any interest in an eTextiles group?

- Midwest Makers are meeting every Thursday 7:30pm-9pm in the FabLab
- Next meetup for eTextile fans: 12 April 2018
Short exercise

A very simple circuit -

http://www.julieboyd.co.uk/e-textiles/
https://youtu.be/5tBHPiduQMM
Soft battery holder

1. CUT OUT POCKET SHAPES
   - Measure size so that the button cell battery (grey) fits inside.

2. SEW CONDUCTIVE YARN
   - Sew a lump of conductive yarn (purple) in the middle of each piece, take the yarn inside the felt to the tip and sew another lump. The lumps should be approx 1cm from the edge of each piece.

3. PLACE BATTERY INSIDE AND CLOSE
   - Place the battery in between the pieces so that the conductive yarn lumps are inside, touching the battery. The + of the battery should touch the conductive yarn. Sew the pieces together, fasten the loose thread.

http://www.julieboyd.co.uk/e-textiles/
You will get:

- An LED – white, red, blue or green
- Conductive thread
- Normal thread
- A needle
- Felt for making your own battery holder
- A 3V battery to try it out; please return it, and on your way home enter the nearest shop and buy one.
Thank you! Keep in touch!

Gabriela Avram

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@gabig58 on Twitter
Coniecto.org

@FutureTextilesLab