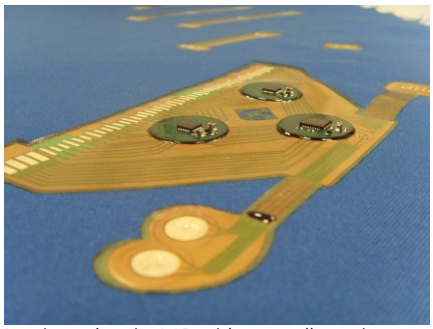
Fraunhofer IZM

Technische Universität Berlin

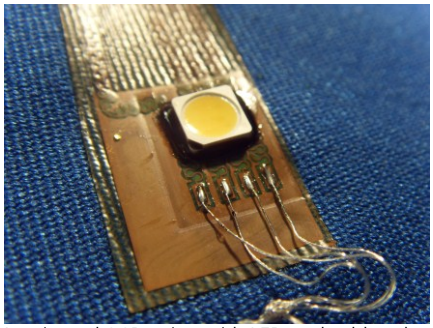
Universität der Künste Berlin

++++++++ e-MOTION +++++++++

[dis.appear]: Interactive coat with SCB technology



Laminated main SCB with controller unit



Laminated SCB stripe with LED and soldered textile-integrated interconnection wires

Fraunhofer Institute for Reliability and Microintegration IZM

Gustav-Meyer-Allee 25
D – 13355 Berlin
Phone: +49 (0) 30 / 464 03-100
Fax: +49 (0) 30 / 464 03 -111
Internet: www.izm.fraunhofer.de

Project Information:

Dipl.-Ing. Christian Dils
Tel.: +49 (0) 30 / 464 03-208
Fax: +49 (0) 30 / 464 03-161
Email: christian.dils@izm.fraunhofer.de

Prof. Valeska Schmidt-Thomsen
Fashion and Textile Design Institute
Berlin University of the Arts
Tel.: +49 (0) 30 / 3185 2558
Fax: +49 (0) 30 / 3185 2063
Email: vst@udk-berlin.de

Background

During the academic year of 2008/09, the interdisciplinary project e-MOTION was exploring new interactions of emotion, motion and microelectronics using the human body as a reference. Within the project eight visionary outfits were developed at the intersection of fashion, design and technology.

Concept

One of the outfits was [dis.appear] which is inspired by the urban streets at night, where the ambient light of the buildings, lanterns and cars illuminates the city, but the people "disappear" behind that. [dis.appear] is designed as a coat, which reflects this atmosphere through integrated white light-emitting diodes (LEDs). The LEDs which are placed on the lining fabric create diffused light circles on the surface as an interpretation of the city lights. When the wearer is not walking, the light circles are fading according to the intensity of the surrounding city lights. The light circles are fading out when the wearer is walking.

Realization

An integrated accelerometer is used to control the LEDs. The brightness of the light circles is synchronized by two light sensors, placed at the front and the back of the coat. The controller unit consists of an ATmega 644P microcontroller and two 16-channel, 12-bit PWM LED drivers. The electronic components are placed onto several stretchable circuit boards (SCB) and laminated to an inlay. The interconnections are realized with isolated copper wires that are laid and fixed to the fabric by sewing and soldered to the contact pads of the SCBs. Additional textile layers are place in order to create diffuse and clear-shaped light circles onto the surface of the coat.

The concept and realization of [dis.appear] has been done by Theresa Lusser with support from the UdK Berlin. The technical work has been done by Christian Dils, Manuel Seckel and René Vieroth from Fraunhofer IZM and TU Berlin. The SCB technology was developed at TU Berlin within the European project STELLA.

Design of the interactive coat [dis.appear]

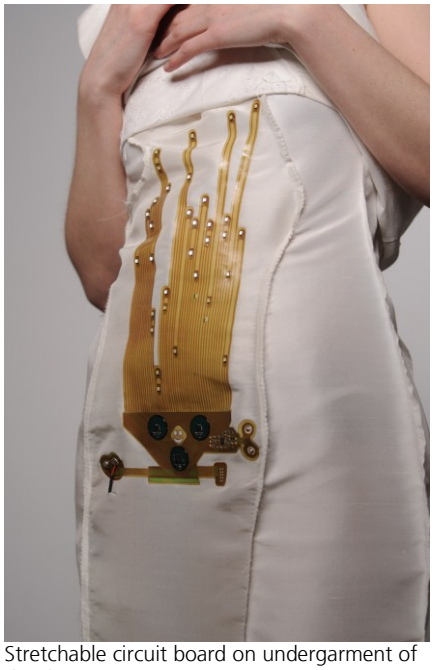
Fraunhofer IZM

Technische Universität Berlin

Universität der Künste Berlin

++++++++ e-MOTION +++++++++

Pneuma: Respiration dress with Stretchable Circuit Board technology



Stretchable circuit board on undergarment of the dress

Fraunhofer Institute for Reliability and Microintegration IZM

Gustav-Meyer-Allee 25
D – 13355 Berlin
Phone: +49 (0) 30 / 464 03-100
Fax: +49 (0) 30 / 464 03 -111
Internet: www.izm.fraunhofer.de

Project Information:

Dipl.-Ing. Christian Dils
Tel.: +49 (0) 30 / 464 03-208
Fax: +49 (0) 30 / 464 03-161
Email: christian.dils@izm.fraunhofer.de

Prof. Valeska Schmidt-Thomsen
Fashion and Textile Design Institute
Berlin University of the Arts
Tel.: +49 (0) 30 / 3185 2558
Fax: +49 (0) 30 / 3185 2063
Email: vst@udk-berlin.de

Background

Pneuma was created during the interdisciplinary project e-MOTION. The partners of the one-year project were the Fashion and Textile Design Institute (IBT) from the University of the Arts, Berlin , Fraunhofer IZM, TITV Greiz and Prof. Dr. Zane Berzina from Goldsmith College, London.

Concept

This project aims to encourage the user of the dress to breathe deeply and thoroughly. A cocktail dress has been designed where the respiration is measured around the waist and the output is transformed into light. Light-emitting diodes (LEDs) integrated onto the undergarment of the dress in an ornamental pattern, are fading in and out along with the breath movement and are related to the strength of in- and exhaling.

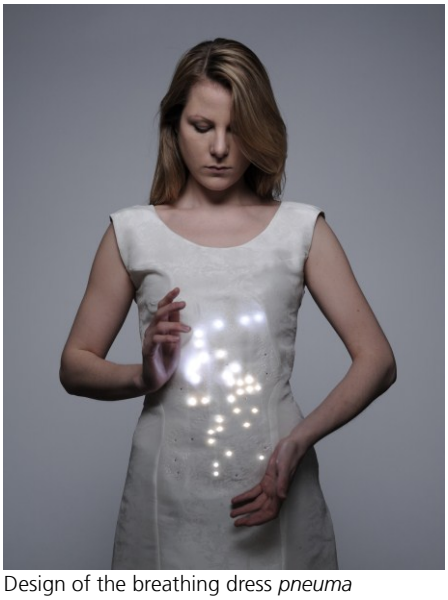
Realization

A carbon filled rubber yarn is sewed onto a tight fitting bodysuit and is used to detect the respiration which is processed by an active filter (fourth stage) and an ATmega 644P microcontroller.

The controller unit, including additional two 16-channel, 12-bit PWM LED drivers and 32 white LEDs are mounted on a 30 x 40 cm large stretchable circuit board (SCB) which is laminated onto the inner layer of the dress.

Both, the undergarment and outer garment are made of white raw silk. Pearl-shimmering screen print and amorphous embroidery are applied to the surface of the dress in order to achieve an illusion of ice crystals in air. Swarovski crystals are placed next to the LEDs to reflect the light.

The concept and realization of Pneuma has been done by Synne Geirsdatter Frydenberg with UdK Berlin. The technical work has been done by Christian Dils, Manuel Seckel and René Vieroth from Fraunhofer IZM and TU Berlin. The SCB technology was developed at TU Berlin in the EU project STELLA. Material support was provided by Swarovski, Madeira and TITV Greiz.



Design of the breathing dress *pneuma*