

Wearable Sensors and Smart Textiles

Dr. Shirley Coyle
CLARITY Centre for Sensor Web Technologies
Dublin City University , Glasnevin , Dublin 9, Ireland

CLARITY

Centre for Sensor Web Technologies



Chemistry

Materials Science

Engineering

Computer Science

Physiology

Physiotherapy

Sports Performance

Microelectronics

.....and Fashion Design!

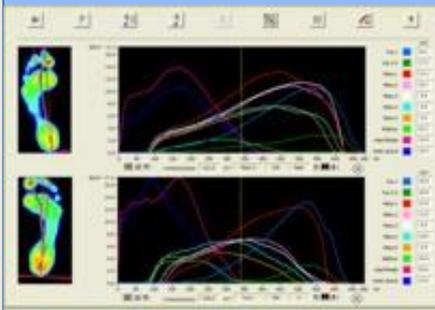
CLARITY
clarity-centre.org

sfi
science foundation ireland
fondúireacht eolaíochta éireann

Areas of Research

Body Movement

Rehabilitation garments
Sports Performance
Breathing technique



Sweat analysis



Hydration

Sense environment

Fire-fighters
Emergency disaster
personnel



Interactive textiles



Crafts
Textile art

Wearable technology – Functional Fashion



Monitor heart rate, speed, distance



exm  baby



Zephyr Bioharness



Nike+

Wearable technology – Functional Fashion



Voltaic – solar powered bag



Heated gloves



Solar panel bikini,
TISCH, NYU



iPod jacket



Hussein Chalayan



Rodarte



Chanel

D.I.Y. Fashion & Technology



<http://www.fashioningtech.com/>



<http://www.iheartswitch.com>

<http://www.instructables.com>



Workshops

TECHNOLOGY + TEXTILES: E-TEXTILES FOR TEXTILE AND FASHION DESIGN PROJECTS

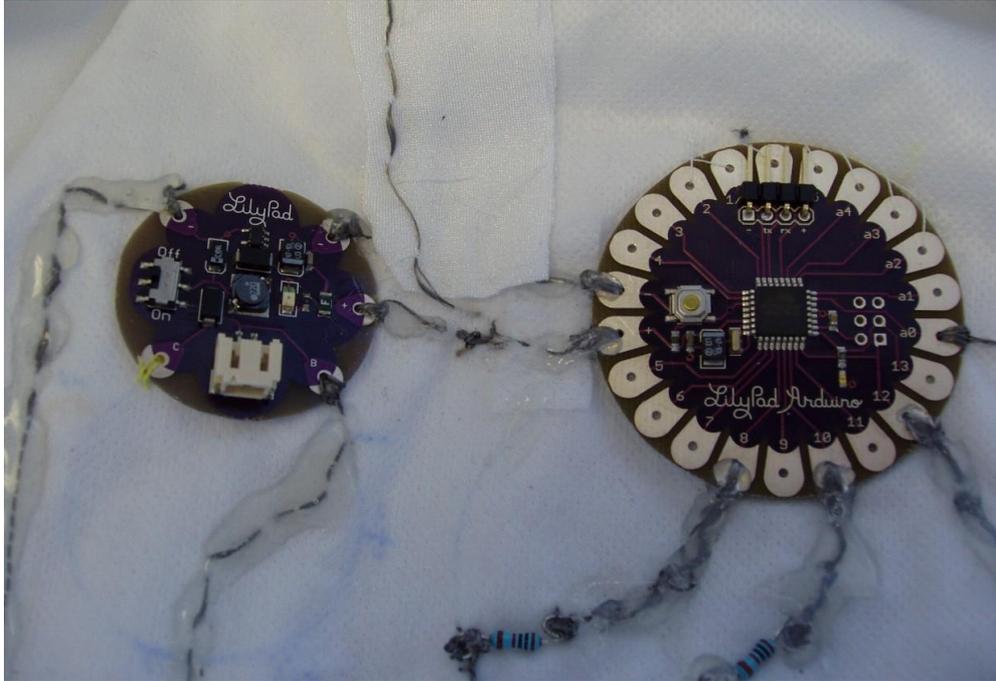
KOBAKANT



Time: Feb 2nd - March 23rd, on Thursday 13-17, Friday 9-17 weekly Location: The Swedish School of Textiles, Borås, Sweden Lecturer: Mika Satomi This is part of MA study at the Swedish School of Textiles. The course aims to introduce basic skills and knowledge on e-textile practices such as electronics, programming and e-textiles specific material [...]

<http://www.kobakant.at/DIY/>

Textiles and electronics

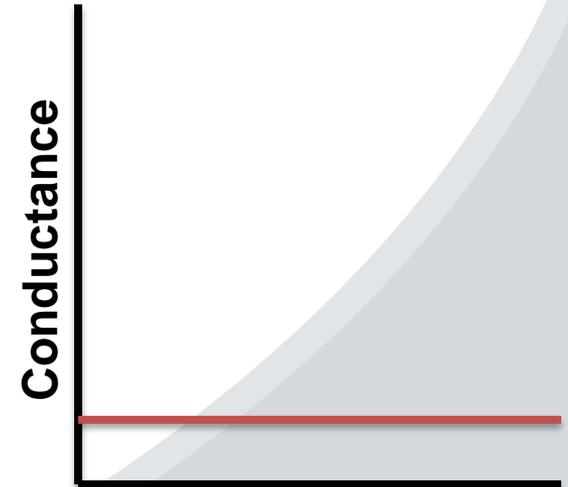
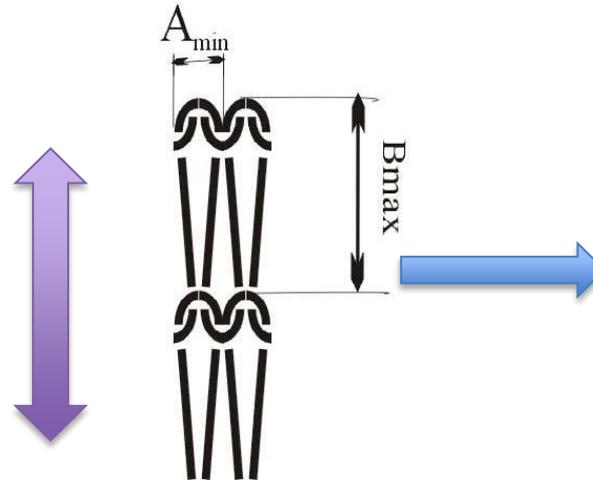
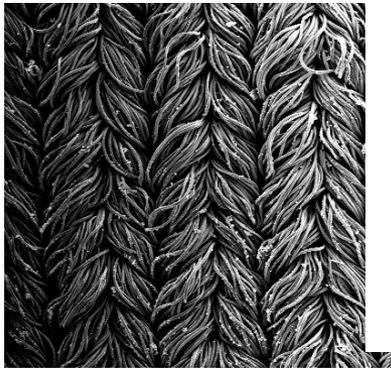


Lilypad Arduino



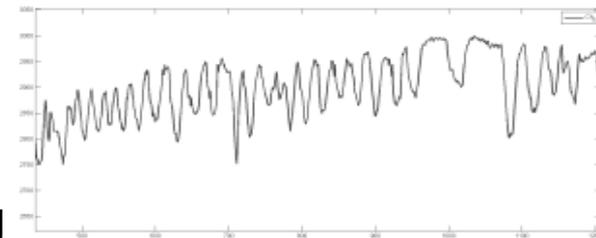
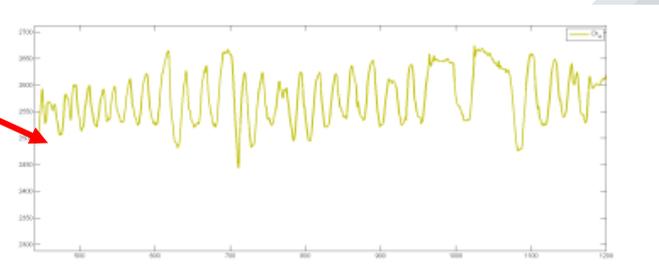
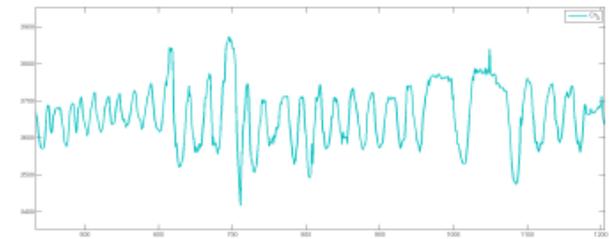
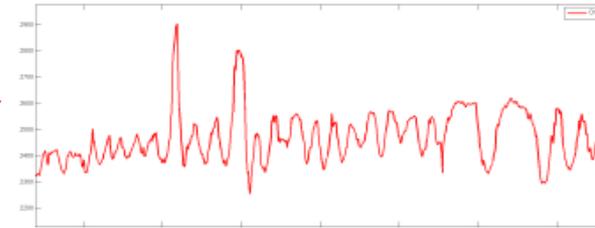
Aniomagic Sparkle Kit

Fabric sensors



Fabric stretch sensors – knitted fabrics coated with conductive material

Breathing technique



Multiple sensors

Deep breathing vs short shallow breathing

Importance of Breathing Technique

Sports performance



Use of full lung capacity to maximise oxygen delivery to muscles

Use of breathing techniques to calm and focus

Clinical applications

COPD, Asthma, Anxiety treatment, Cystic fibrosis, Respiratory rehabilitation, Sleep apnea

Yoga



Rehab glove



Shapehand Data glove

Virtual reality and motion capture

Awkward to set-up

Rigid

Encourages finger flexion

Very expensive ~\$10,000



Textile based glove

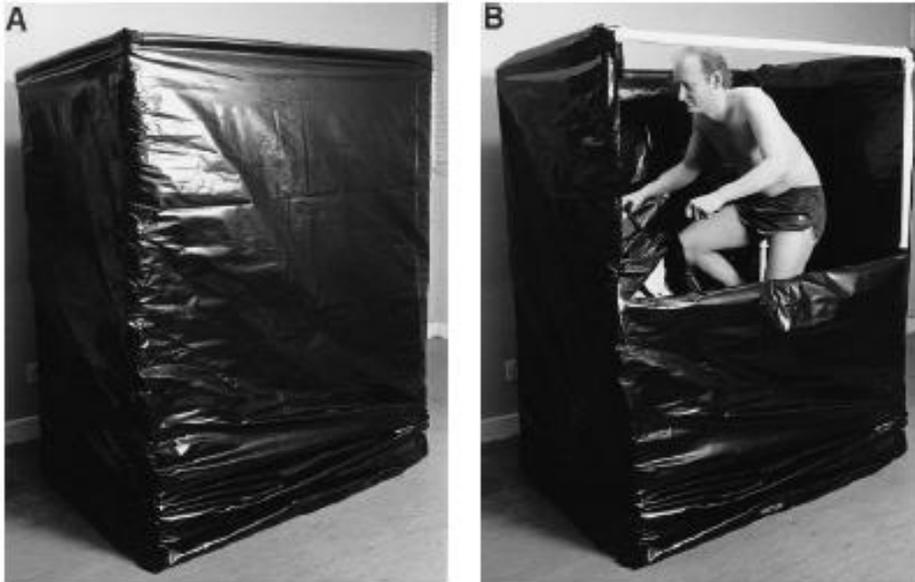
Designed for home rehabilitation

Comfortable, familiar

Fabric allows natural movement

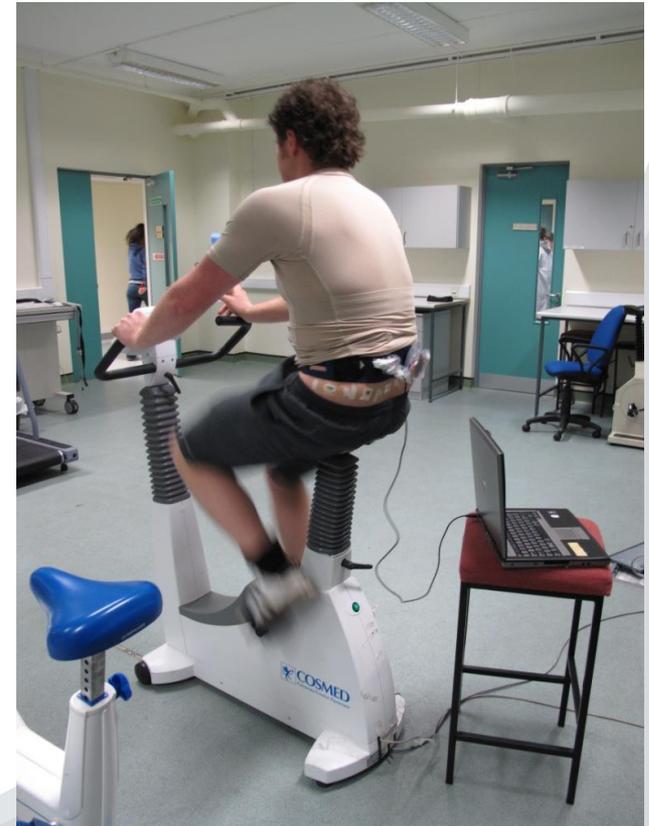
Low-cost

Sweat analysis



Wash-down technique

S. M. Shirreffs and R. J. Maughan , *J Appl Physiol* 82: 336-341, 1997



Real-time analysis of sweat

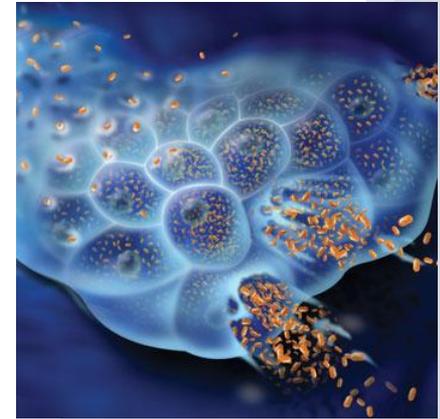
Interactive textiles

Collaboration with Niki Collier Designs

<http://www.nikicollierdesign.com/>

Virus Smart: Smart Textile Interactive Toys

Felt toys have flexible and electronic textile components to sense and respond to their environment. They spread through touch and coughing/sneezing using variety of sensors and actuators.



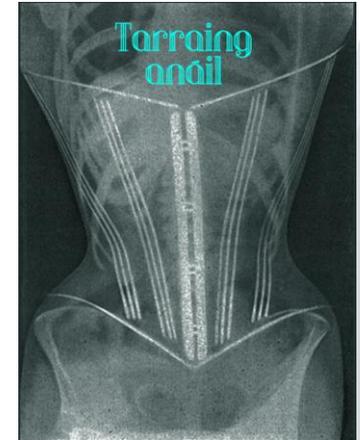
Night Fury

A coat that generates a distress signal when you are in danger



Biofeedback and Interactive Art

Tarraing anáil invites you to rethink the most natural of all tasks, breathing. The way we breathe affects everything we do; how we feel, our energy levels, how well we concentrate, our memory, our sleep and the choices we make.



A smart corset, unlike other corsets, allows you to breathe fully. It is embedded with electronics including sensors and fibre optics. The respiratory breath sensors measure your breathing behaviour and translate it into sound and light.

Collaboration with Jiann Hughes, Media artist and researcher, University of Technology Sydney

Acknowledgements

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Ms. Jiann Hughes

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