WEARABLE TEXTILE SYSTEM. DESIGN LAYERED INTELLIGENT MATERIALS

OER: WEARABLE TEXTILE SYSTEM. DESIGN LAYERED INTELLIGENT MATERIALS

Objective & Scope

Placed in between the digital and human world wearables have the potentialities to change the way we live and interact with each other's thanks to the enhanced functionality of sensing, reacting, and/or adapting to stimuli in the environments to which they are exposed.
Wearables fall in many different categories: glasses, jewellers, headgear, belts, arm wear, wrist wear, leg wear and footwear are taking on new forms and functions but also skin patches and e-textiles.
Understanding where and how to place electronics/hard components by incorporating the 'wearer' into the design. Design a Wearable textile systems exploiting smart textile in the field of sports. Wearable a technology deal with systems worn as unobtrusively as clothing. As such, wearables further effect the person's interaction with the world and his interaction with his own body. If the wearable won't be in accordance with wearer's needs, it will not be an ideal solution to be worn.

Activity Question

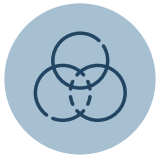
How can we design more human friendly interfaces and products around the body using smart textile?

Learning Goals

- Understand where to place the wearable shape and the unobtrusive shapes.
- Shape smart textile into a clothing/wearable by considering user perspective.
- Design smart "wearable" textiles using a layered system material as platform that embraces the electronics features.

Categories

Smart Textiles



Design Process

Product Design

Textile Technology

References

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- Berglin, L. (2013). Smart Textiles and Wearable Technology - A study of smart textiles in fashion and clothing. A report within the Baltic Fashion Project, published by the Swedish School of Textiles, University of Borås.
- Canina M., Ferraro V. (2008). Biodesign and Human Body: a New Approach in Wearable Devices, International Design Conference Cumulus Kyoto 2008, Cumulus (International Association of Universities and Colleges of Art, Design and Media) Kyoto Seika University, Kyoto, Japan, 28-31 March, 2008.

Support material

- Material samples
- If online activity: link with the sources
- OER
- Summary presentation

Equipment

Laptop

A.

Design around the body: The form follows the function

1. Make smart textile research:
build a shared knowledge repository of existing smart textiles but also proof of concept to identify the most relevant features potentialities for your project.

2. Chose the what and the where:
·What: Prevention, Self-motivated, Keeping Fit for Autonomy, Keeping Fit for Thriving, Competition, Self-improvement, Social, Physical Progress
·Where: Motorcycle, Cycling, Running, Hockey, Dancing, Skiing

3. Set the counter brief.
Example: Design a smart shirt device able to detect the he-art rate and sensing the Co2 in the air. The system informs the user about the high heart rate using light; it lights up when there is pollution in the air.

4. Design around the body
Use the langer lines and Wearability parameters to design the item. The Institute for Complex Engineered Systems (ICES) developed a study about this topic, "Design for Wearability", by outlining a design guideline for wearable products. The wearability parameters developed by the ICES are:

- Attachment: the way the different forms are fixed to the body
- Size: cross section variation of human body
- Human movement: the way the form of body changes whit simple motion
- Unobtrusivity: body areas less obtrusive for wearable products
- Body motion: body areas with low movement/flexibility

5. Develop
a prototype (not functional) to verify the correctness of the designed shape

Procedure:
1.
Introduction: the activity is introduced by teaching staff using a short presentation (condensation of OER, 10 slides) – 10 minutes.

2.
Supporting Tool: the teaching staff provide the format for performing the repository – 1 hour activity by the students

3.
The teaching staff will provide a list of possible functionality and context for the perimeter of the project. Based on the activity n°1 each group will decide the what and the where of the project– 15 minutes.

4.
Each group will translate the findings of the repository in a design brief with the support of the teaching staff through reviews. - 30 Minutes

5.
The teaching staff will provide the tools for designing correctly around the body and place the "electronics" in a proper way. The groups will work to the ideation of the project – 4 hours

6.
Provide a presentation with the overall project by providing a prototype (also a dirty mock-up) to prove their project.

7.
Discussion: Discussion about the results to share ideas and opinions and see the different variations and experi-mentations. Teaching staff will facilitate the discussion.

A day or mroe than a day

Small Group Discussion

Discover, Define, Develop & Deliver

TEMPLATE FOR RESEARCH

DESTEX
Summer School

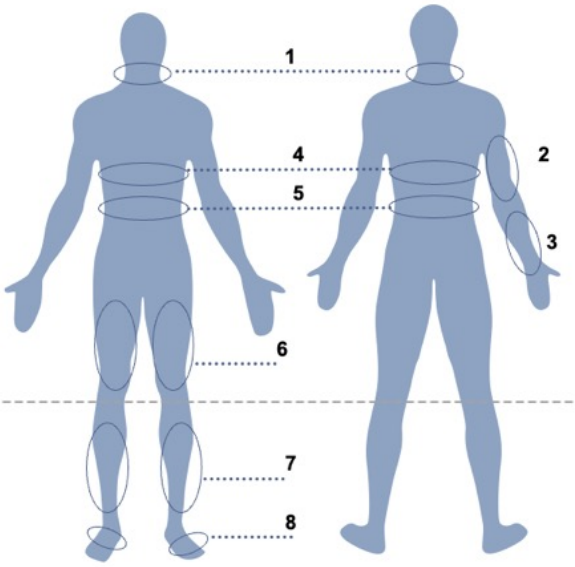
Case study template

Case study (both existing materials and research) *Name:* *Company (if applicable):*	*Website:*
Main description *(Please describe if is a passive or an active smart material)* **Describe the properties** ***Field of Application*** *(if described by the company or into the resource)* ***Main user(s) or item(s)*** *(Please, describe what type of user or items the material is aimed at)* Sources used:	

DESIGN AROUND THE BODY

The most unobtrusive areas for wearable objects:

1. collar area,
2. rear of the upper arm,
3. forearm,
4. rear, side, and front ribcage,
5. waist and hips,
6. thigh,
7. shin,
8. top of the foot



A Langer line, called also *cleavage lines*, is a term used in medical field to define the direction within the human skin along which the skin has the least flexibility. The direction of these lines is very important for surgical operations.