HANDS ON DIGITAL FABRICATION TECHNOLOGIES

OER: NEW FRONTIER FOR TEXTILE. EXPLORING DIGITAL FABRICATION TECHNOLOGIES

Objective & Scope

The framework of technological access first, and the vision of design results related to digital technologies later, allow to envision the latent possibilities that may find space even in industrial applications, if properly grasped and scaled. Therefore, the activity has as its objective the conception and prototyping of design solutions that deploy subtractive and additive manufacturing technology for wearables with textile components (e.g. 3D punch cards, zero waste design, printing on fabric, creating flexible geometries using a rigid material, etc.). The goal of this activity is to nurture creativity in a way that is closely related to experimentation through technology.

Activity Question

How can additive and subtractive digital fabrication technologies be used in textiles to expand existing conceptional and production possibilities?

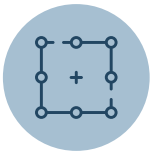
Learning Goals

- Be able to understand how to engage additive and subtractive digital technologies to do experiments with and on textile materials, starting from information and inspirations drawn from case studies.
- Be able to reproduce, produce, and conceive new product and process outputs.
- Be capable of understanding when digital fabrication technologies can be used at experimental or production level.
- Be able to propose and apply new design solutions related to the integration between digital technologies and textile material to develop scalable and sustainable innovations.

Categories

Design Process

Product Design



Advanced Textile Technology

References

- Instructables. (n.d.). Instructables. Retrieved 2021, from https://www.instructables.com/
- Fabric Academy. (n.d.). Fabric Marketing Academy. Retrieved 2021, from https://www.fabric-academy.com
- Distributed Design - Connecting Makers And Designers. (n.d.). Https://Distributeddesign.Eu. Retrieved 2021, from https://www.distributeddesign.eu/
- Polifactory – Politecnico di Milano. (n.d.). Fabcare | DDMP. Polifactory Polimi. Retrieved 2021, from https://www.polifactory.polimi.it/en/polifactory/fabcare/
- Not Just a Label. Retrieved 2021, from https://www.notjustalabel.com/homepage
- Rissanen, T. (2013, May). ZERO-WASTE FASHION DESIGN: a study at the intersection of cloth, fashion design and pattern cutting. University of Technology, Sydney. https://opus.lib.uts.edu.au/bitstream/10453/23384/6/02whole.pdf

Support material

- Presentation outline, Data sheets, Technological information sheets
- Optional: material samples
- OER
- Summary presentation

Equipment

Laser cutter, FDM 3D printer(s), PLA/TPU/ABS filaments, synthetics fabrics, paper (for paper patterns and punch cards), threads of different thickness, potential analog or digital components to be integrated (optional)

Output

Vector and/or 3D file(s), study models, prototype, pictures, presentation, short description, short video (optional)

A.

Understanding technologies difference and possibilities

1.
Understanding the peculiarities of laser cutting technology through support materials (presentation and guideline sheets, and material samples, if available) provided by teaching staff

2.
Understanding the peculiarities of 3D printing (with particular attention to FDM technology) through support materials (presentation and guideline sheets) provided by teaching staff

3.
Identify inspirational case studies for both technology categories to support the following synthesis section. Students are asked to do a desk research, and then collectively return a selection of 5 case studies for each technology, selected to critically highlight their strengths.

Around half a day

Large group

Discover & Define

B.

Designing for technologies and experimenting with them

From 3d printing:

1.
Defining whether you want to work with subtractive or additive technology

2.
Choosing the strategy to adopt (use in prototyping or production phase) and the material on which to operate: for subtractive technology fabric, paper, etc; for additive technology fabric+PLA/TPU/ABS/PA, or use of 3D printed parts interconnected to the fabric etc.

3.
Developing the idea and preparing the vector and/or 3D file(s); then evaluating and designing any changes to be carried out to the machinery in the prototype phase, according to the technological constraints.

4.
Piloting and testing.

5.
Final presentation of the results of the trials, through which the objectives achieved, any failures and what has been learned from the testing should be highlighted.

A day or more than a day

Small Group

Develop & Deliver