

Physical Interfaces – Smart Textiles - Elective Module in BA IA, CE, KD (4th Semester)

Prof. Dr. Helge Oder

The "Smart Textiles" module offers students a comprehensive exploration of intelligent fabric technologies. Emphasizing the fusion of traditional textile techniques with contemporary electronics, the course focuses on integrating technical elements like sensors into textiles. Students gain hands-on experience with microcontrollers to craft interactive and functional textiles.

Throughout the module, diverse topics are covered, ranging from developing textiles that gather wearer data to delivering contextual information. Attention is given to both conscious and subconscious information processing and its effective presentation to wearers. From the aesthetic utilization of Smart Textiles to their role as communication tools and seamless interfaces with digital devices, the course explores various applications.

Through partnerships with the Recycling Atelier, the ELLSI Learning Laboratory at the Institute for Textile Research Augsburg (ITA), and the Hybrid Things Lab, students not only receive a foundational understanding of textiles but also engage in implementing their ideas using prototyping techniques like Rapid Prototyping and Creative Coding.

This module not only emphasizes conceptual approaches but also nurtures practical and creative skills in textile processing and recycling. It's intentionally experimental, allowing students to develop their focuses within the thematic field.

Offering insights into the diverse realm of Smart Textiles, the module encourages active participation in research and implementation across different application domains.

Contents and Focus:

Conceptualization and Design:

- Introduction to Smart Textiles and their applications.
- Development of concepts for integrating digital technologies (e.g., sensors, actuators) into textiles.
- Creating application scenarios for Smart Textiles through an iterative process involving idea development, conceptualization, experimental design, and prototyping.
- Practice-oriented and interdisciplinary project approach enabling in-depth, experimental exploration of thematic focuses.

Prototype Development:

- Translating concepts into functioning prototypes.
- Basic training in TouchDesigner and Arduino programming.
- Fundamentals of sewing techniques.
- Opportunity for experimental use of a programmable knitting machine.
- Technical and craftsmanship support for prototype implementation.

Resources and Support:

- Access to workshop resources at the Recycling Atelier, ELLSI Learning Laboratory at ITA, and Hybrid Things Lab/Prototyping Lab, including CE workspaces in the X-Bau.
- Borrowing Arduinos and sensors; materials for non-reusable processing to be self-financed (approx. cost: 15 euros).

Participation Requirements:

- Open to students in Bachelor programs CE, IA, and KD.
- No specific prerequisites.
- Programming/coding and prototyping knowledge helpful but not mandatory.
- Course available in the "Human & Machine" specialization as "Physical Interfaces" or "Physical Interfaces (Advanced)".