

INTERNSHIP/FINAL THESIS – Developing a smart running garment

Are you passionate about textiles and interested in exploring the exciting field of fashion and technology? Join us in an innovative project that aims to seamlessly integrate sensors and actuators into garments for runners. This is a unique opportunity to combine your creative skills with cutting-edge technology to create functional wearables for the sports industry.

Together with Movella, the research group Sustainable and Functional Textiles develop a smart garment with integrated motion capture technology and haptic feedback. With this garment, we aim to enhance running performance but also reduces the risk of injuries through effective feedback mechanisms.

TASK DESCRIPTION

In this project, you will dive into the fusion of fashion and technology by integrating sensors and actuators into garments. You will have the opportunity to a garment suited for running considering factors such as sweat management, motion dynamics, and pressure distribution to enhance both user comfort and performance. Additionally, you will explore a variety of textures, structures, and ergonomic designs suitable for running, drawing from cutting-edge research in sportswear and materials. Experimentation with different materials and patterns will be essential to adhere breathability and flexibility in movement.

Your task will be to demonstrate innovative methods of embedding or attaching electronic components into a sportswear garment. While understanding the technical aspects of electronics is not the primary focus, you will learn basic concepts to ensure seamless integration of sensors and actuators into textiles and have the opportunity to learn more about smart textiles and wearables. For those interested in exploring further, there is the possibility to design and create knitted e-textiles. This involves knitting conductive yarns into the fabric to create integrated circuits within the textile, offering a deeper dive into the field of e-textile design.

Together, we will explore methods to securely fix sensors within the garment for accurate measurements and feedback. The challenge is to design a garment with proper placements of the electronics that do not cause discomfort or interfere with movement, while allowing for accurate measurements and feedback. For example, the control module should be placed in an area that is easily accessible but does not hinder the wearer's natural motions, such as near the waist or belt.

PRACTICAL INFORMATION

- **Student profile:** This task requires collaboration with experts in fashion technology, smart textiles, human movement science and user-centered design. We are looking for a student that can connect different fields of expertise, who is hands on in his/her approach and can work independently.
- Students with backgrounds in fashion/textile design, fashion technology, innovative textile development are encouraged to participate. Additionally, students with backgrounds in industrial design or other related fields are invited to join if they have an affinity with fashion/textiles design, smart textiles design, or possess knowledge.
- This opportunity may involve an internship or a graduation assignment.
- Through this project, you will gain hands-on experience in textile engineering, ergonomic design and wearable technology, enhancing your skills and creativity in this innovative field. By contributing to the development of this smart garment, you will be at the forefront of innovation in sports and health technology, potentially impacting the running experience for athletes and enthusiasts alike. If you are passionate about pushing the boundaries of wearable technology and creating tangible solutions to improve performance and comfort, we invite you to join us!
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Fig. 1 Designed, created and courtesy of Melissa van Schaik and Cornel Doornebosch.