

INTERNSHIP OR GRADUATION ASSIGNMENT – Sustainable & Functional Textiles (SFT)

Detecting Recycled Fibres using Optical Microscopy

Background

Sustainability and the circular economy are becoming increasingly important in the textile industry. Many companies require their suppliers to include a certain percentage of recycled fibres in garments. However, verifying these claims is currently not possible. Virgin fibres are cheaper, and suppliers may overstate recycled content (greenwashing). Our research group *Sustainable & Functional Textiles* has developed a set of three analytical technologies which combined have the potential to determine recycled cotton content. In the recently started FiberFact project, carried out together with a cross-border consortium, these methods will be further developed and expanded to include synthetic and regenerated fibres.

One of the methods for detecting mechanically recycled cotton is microscopy. During mechanical recycling, fabrics are cut and torn into fibres, which damages the fibre ends. This damage can be observed under a microscope and used to verify the presence of recycled fibres in textiles. However, it should be noted that fibre damage can also occur during yarn and fabric production processes.

Objective

Earlier, the appearance of virgin and mechanically recycled fibres was imaged and characterised using microscopy. Your internship aims is to further refine this analysis investigate, through imaging and systematic description, how and to what extent textile production processes (carding, spinning, weaving/knitting) damage fibre ends.

Tasks

- Use (optical) microscopy to image and categorise variations in appearance of fibres ends for:
 - *carded* virgin and recycled fibres
 - virgin and recycled *yarns*
 - virgin and recycled *fabrics*
- Quantify the ratio of damaged to undamaged fibres in various 100% virgin and 100% recycled cotton *yarns*.
- Quantify the ratio of damaged to undamaged fibres in various 100% virgin and 100% recycled cotton *fabrics*.
- Support research group AMI (Ambient Intelligence) in developing AI-supported automated image analysis by providing your datasets
- Apply your learnings and feedback from AMI to improve the existing microscopy analysis protocol.

This is an exciting opportunity to work in a cross-border project with partners from both applied universities and industry! You will work in Saxion's Circular Textile Lab (CTL).

Student Profile

- Relevant background (textiles, forensic science, chemistry...) with interest in sustainability and textile analysis.
- Precise, independent, and methodical working style.
- Good planning and communication skills.

Practical Information

Location: Saxion Circular Textile Lab

Contact: Anke ten Berge (a.b.g.m.tenberge@saxion.nl)

Research group: <https://saxion.nl/sft>

Project FiberFact:

- [SFT online magazine](#), page 60.
- www.fiberfact.net
- [LinkedIn](#)

