Feasibility study: A digital garment simulation tool for fashion design linking consumer preference and objective fabric properties

What does the project demonstrate?

The project aims to develop a working demonstrator of an intelligent digital garment simulation tool. The tool will connect consumer preferences, for the particular drape and feel of fashion garments, with the objective properties of the fabrics they are made from.

Garment simulation modelling for the UK fashion industry

Virtual garment simulation is a rapidly evolving technology, which has the potential to shorten the fashion design process and be used to visualise clothing for online shopping. Currently, computer simulations provide only pale imitations of the real garments; missing details such as how a particular fabric drapes and feels. Fashion garments are frequently evaluated by consumers with respect to these qualities, so achieving a more realistic simulation will be a big step forward.

Towards more realistic garment simulation modelling

It has been found that fabric buckling, which is now measurable using LUFHES (a newly developed instrument) characterises not only fabric deformations (how it drapes) but also tactile properties (how it feels). The proposition here is that incorporating fabric buckling data into the algorithm for computer simulation of garments will produce a more realistic result. By harnessing recent advances in machine learning, links can be made between consumers’ subjective responses and objective features of fabrics. This will enable garment designers to acquire valuable feedback about which fabrics to use to achieve a desired customised product or a desirable mass market garment. A pictorial overview of the project is shown overleaf.
The ESPRC-funded Network Plus Connected Everything: Industrial Systems in the Digital Age aims to identify the key challenges we face as digital technologies transform our industrial systems.

The project is the first to connect consumer’s sensory preferences for a garment’s drape and feel to the fabric’s objective qualities in a computer simulation model.

Wider applications

The models and approaches developed in this project can be applied to the simulation of textile products in other contexts (such as for curtains, bedding and furniture used in home interior design and for textiles used by the automotive and medical sectors). They can also be used to improve the visualisation of fabrics in computer game design, animation and in the film industry.

What next?

- Develop digital garment simulation tools for specific user groups, such as fashion designers, or consumers of specific types of fabric products such as sportswear or underwear that sits on the skin.
- Garment simulation models could be refined using ‘big data’ sets collected through online shopping.