

## Skimming Weights Optimization through Data-Driven Approaches: Determining the Training Dataset

Andreea BUNICA, Nathan HUNTOON  
The Fitting Room, Toronto, Ontario, Canada

### Abstract

The paper presents a new technology that enables the production of custom fit, made-to-order garments central to the product of fashion-tech start-up The Fitting Room (TFR). TFR is focusing on disrupting the fashion industry through intuitive virtual try-on and made-to-fit products.

The fashion industry is one of the top polluters globally, producing approximately 3% of global carbon emissions, and generating millions of tons of waste every year. Complex supply chains, overproduction, and high return rates are leading causes of this waste. Virtual Try-On (VTO), is slowly proliferating through the industry, is an initial attempt at using technology to diminish the rate of returns generated by online shopping. VTO is an entry point, but deeper industry restructuring is required to meet the ESG goals of the fashion industry. From a market structure point of view, the rate of returns represents the tip-of-the-iceberg problem: the issues run a lot deeper, starting with dis-informed production and shorter garment style life-cycles. In order to satisfy the demand for more styles, while cutting down on over production and waste, the industry must transition from mass production to a made-to-order on demand production model.

Recent advancements in high fidelity 3D body models from pictures and video have enabled consumers to create digital twins ready for use in custom clothing design. TFR is funneling this new technology to the market, combined with an algorithmic approach to garment customization (Made-to-Fit), and a software-as-a-service (SaaS) supply chain, to enable any designer to offer custom sized clothing, made-to-order, directly from their e-commerce platform.

The challenge of the Made-To-Fit (MTF) algorithm is to parametrically scale an original fabrication-ready garment pattern to fit a customer exactly as intended to a “fit model” and to then generate a cohesive Tech Pack for mass customized production.

In traditional manufacturing, designers use a “fit model”- a standard body that is used for taking measurements- in order to design a garment and to produce its affiliated production pattern. A garment perfectly fitted on the “fit model” can then be graded and scaled to obtain multiple industry-standard sizes. The MTF algorithm’s task is beyond simply automating pattern generation- the task involves parametrically generating infinite patterns that can be tailored with precision to as many body types as possible. The challenge is to extract the exact fit map that the designer intended in the original design, but to scale it to the body of individual customers. The knowledge required to generate a functional parametric scaling model does not translate from traditional pattern-making, as there are no parallel tools in the physical world to fulfill a mass customization task that outputs tailored garments. Made-To-Fit is a computer-specific problem.

**Keywords:** made-to-fit, garment sim, digital fabrication, mass customization, digital twin