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Design automation for customized apparel products

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Abstract

This paper presents solution techniques for a three-dimensional *Automatic Made-to-Measure* scheme for apparel products. Freeform surface is adopted to represent the complex geometry models of apparel products. When designing the complex surface of an apparel product, abstractions are stored in conjunction with the models using a non-manifold data structure. Apparel products are essentially designed with reference to human body features, and thus share a common set of features as the human model. Therefore, the parametric feature-based modeling enables the automatic generation of fitted garments on differing body shapes. In our approach, different apparel products are each represented by a specific feature template preserving its individual characteristics and styling. When the specific feature template is encoded as the equivalent human body feature template, it automates the generation of made-to-measure apparel products. The encoding process is performed in 3D, which fundamentally solves the fitting problems of the 2D tailoring and pattern-making process. This paper gives an integrated

solution scheme all above problems. In detail, a non-manifold data structure, a constructive design method, four freeform modification tools, and a detail template encoding/decoding method are developed for the design automation of customized apparel products.



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Keywords

Automation; Made-to-measure; Fitting; Apparel products; Three-dimensional solution

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