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Abstract:

The traditional pattern-making process is very time-consuming and requires professional fashion design knowledge. In order to develop a form-fitting garment to meet customer's individual needs, pattern makers must rely on a "trial and error" procedure until the customer is satisfied. In this paper, we proposed a "what you see is what you get" (WYSIWYG) way to efficiently develop garment patterns. First, a three-dimensional (3D) garment, using an extracted outline from a garment flat or figure, is modeled in a gravitational virtual environment. The modeled garment is then adjusted until it meets design requirements. Next, the adjusted 3D garment model is expanded by smoothing out the folds and wrinkles. Construction curves are drawn on the surface of the expanded 3D garment model according to design requirements. These curves divide the 3D garment model's surface into many small 3D surfaces. Then, 2D garment patterns are obtained by unfolding these subdivided 3D surfaces. Finally, the flattened 2D patterns are stretched and shrank according to the fabric elasticity. The final patterns can be used for making real garments.

Compared to the current 3D garment pattern-making methods, our proposed method is more robust and well-rounded; not only is the proposed approach versatile towards both tight-fitting and loose-fitting clothing, but also requires no prior knowledge of pattern-making from the user. It also involves garment ease allowance, fabric elasticity, and draping, three factors that had not been previously considered all at once during smart pattern-making procedures, in the designing process.

Key words:

Pattern-making, 3D garment modeling, virtual reality, 3D-to-2D unfolding, interactive design

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