UDC 687.016

MEASUREMENT OF DESIGN PARAMETERS OF THE FINISHED GARMENT BY THE NON-CONTACT METHOD

ИЗМЕРЕНИЕ КОНСТРУКТИВНЫХ ПАРАМЕТРОВ ГОТОВОГО ШВЕЙНОГО ИЗДЕЛИЯ БЕСКОНТАКТНЫМ МЕТОДОМ

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ABSTRACT

3D SCANNING, VIRTUAL DESIGN, VIRTUAL FITTING, CONSTRUCTIVE PARAMETERS

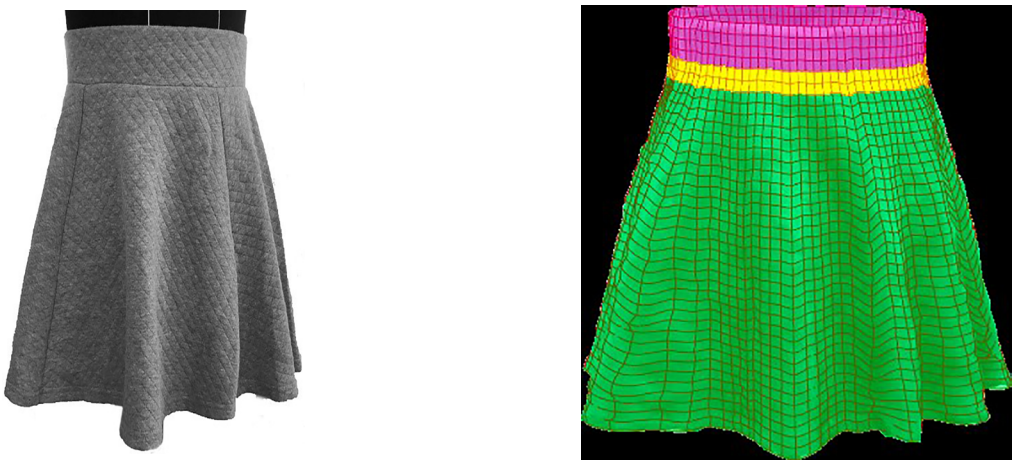
The article describes the process of constructing a drawing of the initial model design of a conical female skirt based on data obtained as a result of scanning a finished garment using a 3D scanner. An iterative algorithm is proposed that allows you to automatically find the outline of a three-dimensional computer model separating the details of the belt and skirt. The developed software module for the Rhinoceros 5 computer-aided design system is described.

Currently, 3D scanners [1-3], devices that allow for the use of optical sensors to create a three-dimensional computer model of the human body, are becoming increasingly popular for measuring the dimensional characteristics of a human figure. One of the promising areas for the use of three-dimensional models of the human body is the creation of virtual fitting rooms, allowing you to choose clothes that correspond to the anatomical features of a person, without a real fitting [4, 5].

Virtual fitting requires both a three-dimensional scan of a human figure and a digital model of the product being tested. A digital model of a garment can be built on the basis of information about the geometric dimensions of its constituent parts (design model drawing) [6]. Such information is part of the design documentation, which, as a rule, is the trade secret of the manufacturer and is not available for retail. At the same time, trade enterprises have a large number of ready-made clothes of interest for virtual fitting. Thus, the urgent task of creating digital computer models of clothing based on ready-made samples containing information about the required geometric dimensions. This problem can be solved by 3D scanning of finished clothes and measuring the geometric dimensions on the resulting 3D model.

As part of this work, we studied the possibilities of constructing a digital model of a conical female skirt using a 3D scanner [7], which consists of a rack with four Kinect sensors [8-10] installed on it and a turntable. The data obtained during scanning was processed using the Rhinoceros 5 computer-aided design system [11]. To automate the process of measuring spatial objects using a three-dimensional model, a specialized module was developed in the environment of the editor of graphic algorithms Grasshopper [12].

Figure 1a shows the appearance of a conical skirt marked in XS size and dressed in a size 44 mannequin.



a **b**

Figure 1

Using the technology of three-dimensional scanning, a three-dimensional computer model of the clothing surface was obtained (Fig. 1b).

Figure 1b shows the area in which there is a contour separating the details of the belt and skirt. The horizontal line corresponds to the area of the belt, the inclined line corresponds to the area of the skirt.

A software product is developed that allows, based on the data obtained as a result of scanning a finished garment using a 3D scanner, to draw a drawing of the original model of a conical female skirt.

An iterative algorithm is proposed that allows to automatically find the contour number of a three-dimensional computer model separating the details of the belt and skirt of a female conical skirt.

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