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FEATURES OF HUMAN FIGURES 3D SCANNING

ОСОБЕННОСТИ 3D-СКАНИРОВАНИЯ ФИГУРЫ ЧЕЛОВЕКА

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ABSTRACT

3D-SCANNER, 3D SCANNING TECHNOLOGY, CLOTHING DESIGN, DIMENSIONAL SIGNS

The article deals with the expansion of the linen fabrics range for the interior, as well as the problems of their design. A collection of fabrics in trending colors is developed.

Non-contact methods are becoming increasingly popular for obtaining information about the dimensional signs of a human figure [1]. There are various systems for scanning and measuring the anthropometric characteristics of the human body.

There are many universal and highly specialized 3D scanning systems presented on the market. Universal systems are designed to scan a human figure as a whole [2, 3]. Specialized systems are widely used in medicine and provide a more detailed 3D model of individual parts of the human body: arms [4], legs [5], chest [6], etc.

Modern 3D scanners allow to get a computer model of the scanned object. The required dimensional characteristics can be measured on the 3D model later.

As part of this work, the task was to measure the size of a human figure for the purpose of designing clothes. 3D models were obtained using a 3D scanner consisting of 4 Kinect sensors mounted on a fixed bar and a rotating platform [7].

The quality of scanning depends on the technical characteristics of the scanning system: the resolution of optical sensors, their number, features of the design, etc., and the features of the scanned object.

In this work, the influence of the position of the human body and its features on the accuracy of measurements of clothing sizes was studied.

The popular models of bodyscanners on the market were analyzed: Artec Shapify Booth, Artec Eva, 3dMDbody.t System, Botscan, VECTRA WB360, Fit3D, mPort mPod, Naked 3D Fitness Scanner, SS20 3D Body Scanner, Styku S100, TELMAT Symcad III, Texel Portal, Twindom Twinstant Mobile, Vitronic VITUS 3D body Scanner, Shapescale, zSnapper 360 Scan, Human Solutions 3D body scanning, Chishine3d RayGo240, 3D Elements, Shapeanalysis 3D Body Scanner. As a result of the analysis, two basic positions of the legs and four basic positions of the hands were identified. This allows to make 8 unique combinations of poses, shown in Figure 1.
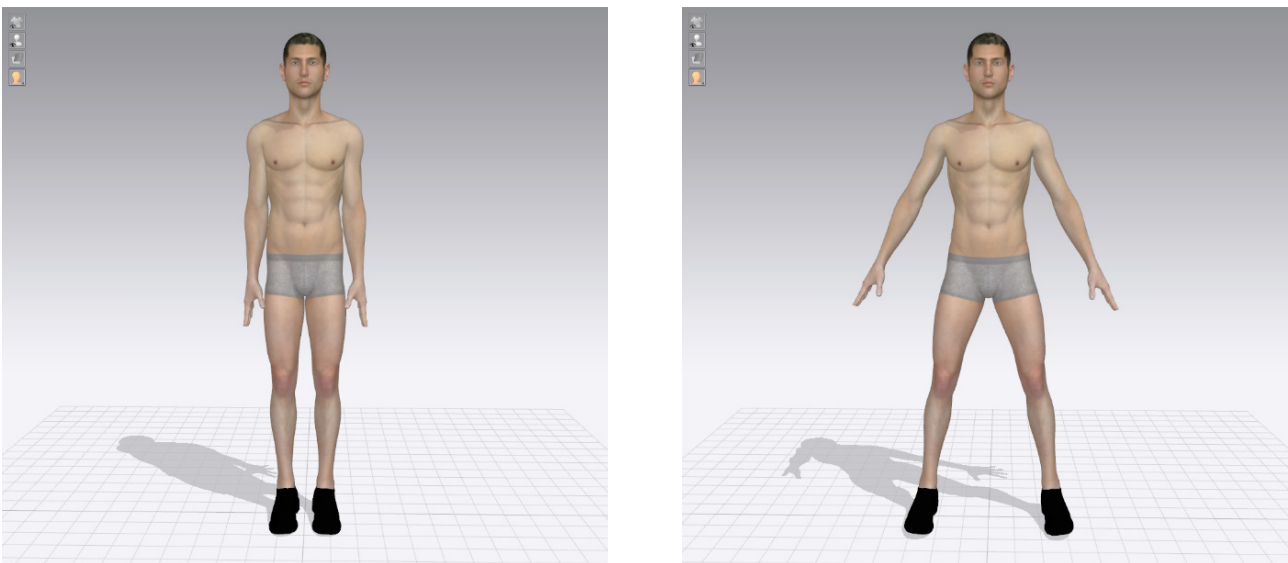

Figure 1 – Position for measuring the size of human's bodies for designing clothes

Figure 1a shows the posture that corresponds the requirements of the standards [8, 9, 10, 11] for measuring the size of human's bodies for designing clothes using the contact measurement method. Figure 1b shows the posture most often recommended by the developers of the botanical systems.

As shown by experimental studies, the difference in the results of measurement of chest girth in middle-aged women in different postures can be 1.5–2 cm. For clothing of free and semi-adjacent silhouettes, this difference may be insignificant due to the use of increases in the freedom of fitting from 10 cm. Designers of clothing with an adjacent silhouette should have this in mind when developing the basic design of a garment.

As a result of the study, a number of recommendations were developed, which enabled to obtain a 3D human model suitable for measuring dimensional signs of a human figure for designing clothes.

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