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Performance evaluation protocol for digital fitting systems —

Part 1: Accuracy of virtual human body representation

Protocole d'évaluation de la performance des systèmes d'habillage virtuel —

Partie 1: Fidélité de la représentation du corps humain virtuel

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 133, *Clothing sizing systems - size designation, size measurement methods and digital fittings*.

A list of all parts in the ISO 20947 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Digital fitting systems are used for evaluating the fit of a garment without making physical patterns or physical garments. In a digital fitting system, a virtual garment is made using virtual patterns, and the fit of physical garment(s) on a physical human body is assessed by draping a virtual garment on a virtual human body or a virtual fit mannequin (fit form). Such systems are useful for designers and manufacturers, educationalists and retailers of garments because the system helps to improve the fit of garments and productivity. It can also be useful for consumers for assessing the fit of mass-produced garments, for online shopping or for selecting an appropriate size.

The digital fitting system enables examination of the fit of a garment by placing a virtual garment on a virtual human body. Greater accuracy in examining the fit of the virtual garment requires a virtual human body representing the human body accurately. There are several methods for creating the virtual human body. The most popular is the use of a 3D body scan data of a human body, scan data of a fit mannequin representing a specified human form and a parametric model created from body dimensions.

This document defines the virtual human body system that forms the basis of the digital fitting system. This document establishes not only the basic functional requirements of this system but also the protocol for assessing the quality of the virtual human body. The protocol is expected to enable users of digital fitting systems (designers, educationalists and retailers) to choose the virtual human body system most appropriate for their purposes and, at the same time, realize easier performance evaluation of digital fitting systems that make use of the virtual human body (including virtual fit mannequin) model. Since the accuracy of scan-derived measurements and surface shape depends on the accuracy of 3D body scanner system used, manual measurements are used for quantitatively evaluating the accuracy of a virtual human body. Accuracy of scan-derived measurements should be evaluated according to ISO 20685-1.

Performance evaluation protocol for digital fitting systems —

Part 1: Accuracy of virtual human body representation

1 Scope

This document focuses on the method of quantifying the differences in body dimensions and visualizing shape differences between the human body and a virtual human body model. This document provides a performance evaluation protocol for virtual human body representation systems, which create virtual human body (including virtual fit mannequin) models based on 3D body scan data and/or body dimensions data of a human body. The required accuracy of a virtual human body depends on the purpose and use of the digital fitting system.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8559-1, *Size designation of clothes — Part 1: Anthropometric definitions for body measurement*

ISO 18825-1, *Clothing — Digital fittings — Part 1: Vocabulary and terminology used for the virtual human body*

ISO 18825-2, *Clothing — Digital fittings — Part 2: Vocabulary and terminology used for attributes of the virtual human body*

ISO 20685-1, *3-D scanning methodologies for internationally compatible anthropometric databases — Part 1: Evaluation protocol for body dimensions extracted from 3-D body scans*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
digital fitting system
fitting system that provides qualitative and/or quantitative evaluations of overall and/or specific simulation garment fit through analysis of the distribution of surface strain, gap between body and garment, heat map, cross section, surface wrinkles, seam drop, garment balance, etc.

3.2
virtual human modelling system
system for creating a *virtual human body* (3.3.2) for a specific market or individual

Note 1 to entry: Asymmetrical shape assumed to match the body shape of the individual.