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Clothing — Digital fittings —

Part 2:
Vocabulary and terminology used for attributes of the virtual human body

Habillement — Bien-aller virtuel —

Partie 2: Vocabulaire et terminologie utilisés pour les caractéristiques du corps humain virtuel

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Foreword

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The committee responsible for this document is ISO/TC 133, *Sizing systems and designations for clothes*.

ISO 18825 consists of the following parts, under the general title *Clothing — Digital fittings*:

— *Part 1: Vocabulary and terminology used for the virtual human body*

— *Part 2: Vocabulary and terminology used for attributes of the virtual human body*

— *Part 3: Vocabulary and terminology used for virtual bones and joints of the virtual human body*

— *Part 4: Vocabulary and terminology used for the virtual torso, arms and legs of the virtual human body*

— *Part 5: Vocabulary and terminology used for the virtual head and face of the virtual human body*

— *Part 6: Vocabulary and terminology used for the virtual hand of the virtual human body*

— *Part 7: Vocabulary and terminology used for the virtual foot of the virtual human body*

Introduction

The virtual human body in the virtual garment system should reproduce the actual shape and size of human body with known reliability. It should also have attributes applicable to making and wearing clothes. Among these attributes it is essential that the definitions of virtual landmarks and virtual body dimensions are consistent with those defined for actual humans.

Virtual human body is not defined based on human anatomy. However, since virtual human body needs to have body dimensions very close to those of the actual human body, virtual landmarks are closely associated with anatomical landmarks defined on the human body.

Definitions and the procedure of body measurement were prescribed in 'Garment construction and anthropometric surveys-body dimensions' (ISO 8559). In addition to this, virtual body dimensions of the virtual human body should be defined in the three-dimensional virtual space because the surface of the virtual human body cannot be touched in reality. And virtual landmarks of the virtual human body should be detected from x, y, z axes using a visual detective method on the screen. Therefore, virtual body dimensions and virtual landmarks of the virtual human body need to be modified and defined for use in three-dimensional virtual space while maintaining similarity to existing anthropometric body dimensions.

When a virtual human body of the same size is made with each different virtual garment system, the results of the virtual human body size and flatness etc. are different., not only because the current virtual garment systems have different size changing algorithms, but also because they use different definitions of body dimensions of the virtual human body. This confuses users on the terms related to the body dimensions of the virtual human body, and online sales using unstandardized virtual garment systems could lead to more errors in clothing size. This can be solved by standardizing terms and definitions of body dimensions of the virtual human body and suggesting essential body dimensions of the virtual human body.

This International Standard is proposed as the second in a series of standards that deal with the virtual human body. The purpose of this series of international standard is to improve online communication and reliability of fashion products sold online through visual confirmation of size, fit, and design by standardizing the terms related to the virtual garment system.

Continuing the previous proposed standard 'Vocabulary and terminology used for the virtual human body,' (pr 18825-1 (N 0031)) which deal with composition and attributes of the virtual human body, this international standard defines terms necessary to describe virtual human body. Developers of virtual garment system should use the same terms described in this international standard.

Clothing — Digital fittings —

Part 2: Vocabulary and terminology used for attributes of the virtual human body

1 Scope

This International Standard defines the terms used to describe the virtual human body which is used in virtual garment systems. Specifically virtual landmarks and virtual body dimensions are described.

This international standard mainly deals with vocabulary and terminology of essential virtual body dimensions of the virtual torso, arm, leg, head, face, hands and bones and joints of virtual human body.

Since there are many landmarks on the head and hand, landmarks on these parts are defined separately from those on other parts of the body.

This international standard is intended for developers of virtual garment systems. Although this international standard does not aim at users of virtual human body in online communication, the improved reliability of virtual human body will benefit them.

2 Normative references

This International Standard should be read in conjunction with the following International Standards.

ISO 8559-1, *Garment construction and anthropometric survey — Body dimensions*

ISO 20685, *3-D scanning methodologies for internationally compatible anthropometric databases*

ISO/IEC 19774, *Information technology — Computer graphics and image processing — Humanoid Animation (H-Anim)*

pr 18825-1 (N0031): Part 1. Vocabulary and terminology used for the virtual human body

ISO/IEC 19794-5, *Information technology — Biometrics biometric data interchange formats — Part 5: face image data*

ISO/IEC 19774, *Information technology — Computer graphics and image processing — Humanoid Animation (H-Anim)*

3 Terms and definitions of the virtual body dimensions of the virtual human body

3.1 Virtual landmark (see pr 18825-1)

3.1.1
Virtual top head point
The highest point of the head on the midsagittal plane with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.2
Virtual neck point
The middle point of the front neck between the virtual top neck point and virtual front neck-base point on the midsagittal plane with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.3
Virtual front neck-base point
The most concave point under the front neck on the midsagittal plane with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.4
Virtual side neck-base point
The intersection point of the concave contour line at the neck-base passing through the shoulder ridge line with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.5
Virtual back neck-base point
The most posterior point at the back neck-base on the midsagittal plane with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.6
Virtual shoulder point
The most lateral point of the shoulder ridge line passing through the cross section covering the middle plane of the torso and arm with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.7
Virtual axillia point
The lowest point under the axillary passing through the cross section between the torso and arm with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.8
Virtual front axillia point
The most anterior point of upper arm at the same level as the virtual axillia point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3)

3.1.9
Virtual back axillia point
The most postrerior point of upper arm at the same level as the virtual axillia point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.10
Virtual bust point
The most anterior point of the bust with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.11
Virtual underbust point
The lowest point under the bust part with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.12
Virtual side waist point
The most concave point of the (right) side waist when viewed from the front with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.13
Virtual back waist point
The point of the back waist on the midsagittal plane at the level of the virtual side waist point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.14
Virtual abdomen point
The most anterior point of the abdomen on the midsagittal plane with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.15
Virtual hip point
The most posterior point of the hip with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.16
Virtual crotch point
The lowest point of the torso on the midsagittal plane with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.17
Virtual elbow point
The most protruding point of the elbow.

3.1.18
Virtual wrist point
The most concave point of the extended line of the little finger passing through the cross section between the arm and hand with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.19
Virtual end of 3rd finger point
The distal point of the middle finger with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.20
Virtual gluteal fold point
The most concave point on the sagittal plane passing through the virtual hip point between hip and thigh with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.21
Virtual mid-thigh point
The point of the (right) side thigh when viewed from the front at the middle level between the virtual hip point and virtual knee point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.22
Virtual knee point
The centre point of the anterior part of the knee with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.23
Virtual calf point
The most posterior point of the calf with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.24
Virtual lower leg point
The most concave point under the front lower leg above the virtual side ankle point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.25
Virtual outside ankle point
The most lateral point of the lateral malleolus with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.1.26
Virtual landing heel point
The lowest point of the posterior calcaneus with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

Note 1 to entry: The ‘virtual landing heel point can reach the floor or the top of the shoe heel.

3.2 Virtual body dimensions (see pr 18825-1 (N0031))

3.2.1
Virtual height
The vertical distance between the virtual landing heel point and virtual top head point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.2
Virtual bust height
The vertical distance between the virtual landing heel point and virtual bust point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

Note 1 to entry: When the value of the virtual bust height based on the relation between parameters through data analysis of classified virtual human bodies is set in the virtual garment system, value input is not necessary. When the value of the virtual bust height can be acquired through measurement of an actual person, value input is recommended.

3.2.3
Virtual waist height
The vertical distance between the virtual landing heel point and virtual side waist point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

Note 1 to entry: When the value of the virtual waist height based on the relation between parameters through data analysis of classified virtual human bodies is set in the virtual garment system, value input is not necessary. When the value of the virtual waist height can be acquired through measurement of an actual person, value input is recommended.

3.2.4
Virtual hip height
The vertical distance between the virtual landing heel point and virtual hip point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

Note 1 to entry: When the value of the virtual hip height based on the relation between parameters through data analysis of classified virtual human bodies is set in the virtual garment system, value input is not necessary. When the value of the virtual hip height can be acquired through measurement of an actual person, value input is recommended.

3.2.5
Virtual crotch height ; virtual inside leg length
The vertical distance between the virtual landing heel point and virtual crotch with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.6
Virtual knee height
The vertical distance between the virtual landing heel point and virtual knee point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

Note 1 to entry: When the value of the virtual knee height based on the relation between parameters through data analysis of classified virtual human bodies is set in the virtual garment system, value input is not necessary. When the value of the virtual knee height can be acquired through measurement of an actual person, value input is recommended.

3.2.7
Virtual calf height
The vertical distance between the virtual landing heel point and virtual calf point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

Note 1 to entry: When the value of the virtual calf height based on the relation between parameters through data analysis of classified virtual human bodies is set in the virtual garment system, value input is not necessary. When the value of the virtual calf height can be acquired through measurement of an actual person, value input is recommended.

3.2.8
Virtual shoulder width
The horizontal distance between right and left virtual shoulder points.

Note 1 to entry: Related to recorded or unrecorded landmarks measurement on the virtual human body — could be more or less close to measurement from real human body.

Note 2 to entry: In case of using 'virtual shoulder Width' which refers 'the surface distance', the Notice of changing its meaning must be marked.

3.2.9
Virtual back waist length
The surface distance between the virtual back neck-base point and virtual back waist point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.10
Virtual arm length
The distance of the straight line going through the virtual shoulder point, virtual elbow point and virtual wrist point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

Note 1 to entry: If 'virtual arm length' is used to mean 'surface distance', it must be noted that there has been a change in meaning.

3.2.11
Virtual neck girth
The perpendicular girth to the neck axis passing through the virtual neck point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.12
Virtual neck-base girth
The girth of the contour line passing through the virtual front neck-base point, virtual side neck-base point and virtual back neck-base point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.13
Virtual armscye girth
The girth of the contour cross section between the torso and arm passing through the virtual shoulder points and virtual axillia points with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.14
Virtual upper arm girth
The maximum girth of the upper arm perpendicular to the main axis of the upper arm and passing through the virtual axillia point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.15
Virtual elbow girth
The girth of the arm perpendicular to the main axis of the upper arm and passing through the virtual elbow point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.16
Virtual wrist girth
The girth of the forearm perpendicular to the main axis of the forearm and passing through the virtual wrist point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.17
Virtual chest girth
The horizontal girth of the torso passing through the virtual axillia point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.18
Virtual bust girth
The horizontal girth of the torso passing through the virtual bust point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3) (female).

3.2.19
Virtual underbust girth
The horizontal girth of the torso passing through the virtual underbust point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3) (female).

3.2.20
Virtual waist girth
The horizontal girth of the torso passing through the virtual side waist point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.21
Virtual abdomen girth
The horizontal girth of the torso passing through the virtual abdomen point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.22
Virtual hip girth
The horizontal girth of the torso passing through the virtual hip point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.23
Virtual thigh girth
The horizontal girth of the leg at the level of virtual gluteal fold point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.24
Virtual mid-thigh girth
The horizontal girth of the leg at the level of virtual mid-thigh point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.25
Virtual knee girth
The horizontal girth of the leg passing through the virtual knee point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.26
Virtual calf girth
The horizontal girth of the leg passing through the virtual calf point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

3.2.27
Virtual lower leg girth
The smallest horizontal girth of the leg passing through the virtual lower leg point with the virtual human body in the virtual standing position (pr 18825-1 (N0031) 4.1.3).

