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Health informatics — Categorial structure for representation of 3D human body position system —

Part 1: Bones

Informatique de santé — Structure catégorielle pour la représentation du système de positionnement du corps humain en 3D —

Partie 1: Os

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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 215, *Health informatics*.

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

Anatomical descriptions can be very abstract, requiring long narrative descriptions. These descriptions can lead to ambiguity and coding inconsistency. Text-based expressions lack expressiveness and accuracy, medical information is not captured and re-used sufficiently and there are also issues in interoperability. There is currently no unified way of expressing anatomical concepts.

However, recent advancements in imaging technology are dramatically revolutionizing the field. For instance, the spatial resolution in a CT scan is less than 1 mm. Regarding accuracy and expressiveness, it is believed that the gap between medical imaging and clinical terminology is increasing over time. Patients are also having problems understanding their disease because visualization is not given by standard terminology.

Healthcare workers are seeking to achieve additional expressiveness by adopting 3D data in the medical field. Radiation therapies are designed by 3D systems to generate optimal intensities while protecting adjacent tissue. In operating theatres, operations are often guided by 3D navigation systems. For example, arthroplasties are designed and simulated before surgery using 3D technology. Researchers are also studying ways to simulate operation tactics using 3D data by 3D printing, such as AR (augmented reality) and VR (virtual reality). Since 3D systems can deliver accurate spatial information in the human body, it is evident that a standard terminology infrastructure will provide additional expressiveness, accuracy and comparability when 3D data is adopted in medical informatics. Since anatomy is a key piece of information in many clinical descriptions, 3D data can increase the accuracy and expressiveness of clinical terminology. 3D data are numbers that can be processed by mathematical functions providing more computability in research, software production and artificial intelligence.

3D systems provide a consistent way of expressing anatomical concepts in a precise manner. Accurate data can improve data exchange between electronic health records, epidemiological analysis and quality. Increased accuracy also means better clinical decision support systems for patient safety, reducing medical errors and improving efficiency. It also provides visual information for patients and caregivers when conventional standard terminology system does not. HBPS (Human body position system) is intended to be used in electronic health records, personal health record and various medical research purposes.

HBPS is a way of expressing clinical concepts by combining 3D data and text-based terminology. Although the main purpose of 3D is graphical expression, it can play a terminological role in many ways as it has accurate anatomical concept. It can have attributes that are similar to codes in semantic terminological system. It can be pre- or post-coordinated, just as conventional terminological concepts. Since the data inside a 3D system is purely numeric, it can be captured and retrieved better than semantic medical information.

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1 Scope

This document describes the high-level concepts required for representation of 3D data in health information systems from a terminological perspective. It is intended to be used in analysing, developing and managing terminologies in HBPS. The use cases include clinical findings, disorders, problem lists and procedures.

Topics considered in the scope of this document:

— description of terminological concepts for representation of 3D data for human body;

— establishing of the relationships needed for 3D data in terminological systems;

— use cases.

Topics considered outside the scope of this document:

— 3D data structure, implementation and software functionality.

2 Normative references

There are no normative references in this document.

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 General

3.1.1
3 dimensional
3D
computer graphics that define an object by its width, length and depth

Note 1 to entry: See Figure 1.