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**Information technology — Computer  
graphics, image processing and  
environmental representation —  
Sensor representation in mixed and  
augmented reality**





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## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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 document 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](http://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)

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 24, *Computer graphics, image processing and environmental data representation*.

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](http://www.iso.org/members.html).

## Introduction

This document defines a representation model for physical sensors to be included in a 3D mixed-reality world. It defines 3D modelling, rendering, simulation, and interfaces for physical sensors. It defines a set of principles, concepts, and functionalities for physical sensors applicable to the complete range of 3D mixed reality standards. It includes the following content:

- terms and definition for sensor interfaces;
- requirements and scope;
- a representation model of physical sensors that can be included in a 3D scene;
- 3D modelling, rendering, and simulation of physical sensors in a 3D scene;
- representation of the attributes of physical sensors in a 3D scene;
- representation of I/O data streaming of physical sensors in a 3D scene;
- representation of the interfaces for controlling physical sensors in a 3D scene;
- functionalities and base components;
- relevant physical sensor properties;
- interfaces with virtual and real worlds;
- use cases.

The objectives of this document are as follows:

- provide a reference model for physical sensor-based 3D mixed-reality applications;
- manage and control physical sensors with their physical properties in 3D mixed reality environments;
- provide an exchangeable information model necessary for transferring and storing data between sensor-based mixed-reality applications;
- support user interfaces with 3D mixed-reality worlds;
- support physical sensor interfaces with 3D mixed-reality worlds.

# Information technology — Computer graphics, image processing and environmental representation — Sensor representation in mixed and augmented reality

## 1 Scope

This document defines the framework and information reference model for representing sensor-based 3D mixed-reality worlds. It defines concepts, an information model, architecture, system functions, and how to integrate 3D virtual worlds and physical sensors in order to provide mixed-reality applications with physical sensor interfaces. It defines an exchange format necessary for transferring and storing data between physical sensor-based mixed-reality applications.

This document specifies the following functionalities:

- a) representation of physical sensors in a 3D scene;
- b) definition of physical sensors in a 3D scene;
- c) representation of functionalities of each physical sensor in a 3D scene;
- d) representation of physical properties of each physical sensor in a 3D scene;
- e) management of physical sensors in a 3D scene;
- f) interface with physical sensor information in a 3D scene.

This document defines a reference model for physical sensor-based mixed-reality applications to represent and to exchange functions of physical sensors in 3D scenes. It does not define specific physical interfaces necessary for manipulating physical devices, but rather defines common functional interfaces that can be used interchangeably between applications.

This document does not define how specific applications are implemented with specific physical sensor devices. It does not include computer generated sensor information using computer input/output devices such as a mouse or a keyboard. The sensors in this document represent physical sensor devices in the real world.

## 2 Normative references

There are no normative references in this document.