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| Project | **Specification of Sensor Interface for Cyber and Physical World**  <<http://subgroup.ieee.org/2888/> **>>** |
| Title | **Definitions, acronyms, and abbreviations for IEEE P2888.4** |
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| Abstract | Definitions, acronyms, and abbreviations |
| Purpose | Review and comments |
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1. Definitions, acronyms, and abbreviations
   1. Definitions

For the purposes of this document, the following terms and definitions apply. The IEEE Standards Dictionary Online should be consulted for terms not defined in this clause. [[1]](#footnote-1)

Large-space virtual reality walk-through system: A system applied with technology that allows you to feel a sense of reality in virtual reality space while walking freely in a space of 5m\*7m or more.

Virtual Reality Disaster Response Training System with Six degrees of Freedom (6DoF): A system applied with technology that allows you to feel realistic in a virtual reality space with 6DoF freedom by walking freely in a space with a real space of 5m\*7m or more.

Walkthrough: VR technology that allows users to touch and feel virtual objects while actually walking around the virtual reality space. Such technology provides superior experience of freedom, angle diversity and informational and interactive play compared to traditional methods of using controller-to-controller movement.

Disaster response training system: A real-world training program that implements various disasters in virtual reality and provides response training or experience without the risk of users (trainers or experiencers).

Six degrees of freedom (6DoF): Six operating elements of a moving object in three dimensional space. 6DoF can be used to describe rotational movements (roll, pitch, yaw) and translational movements (forward/back, left/right, up/down).

VR (Virtual Reality): A technology that creates a virtual world with a sense of reality on a computer.

AR (Argumented Reality): A technology that overlaps the real world that users see with their eyes and displays virtual objects with additional information in real time in a single image.

MR (Mixed Reality): A realization technology that expresses by mutually augmenting real and virtual objects.

XR (eXtended Reality): An ultra-realistic technology and service that encompasses mixed reality (MR) technology that encompasses virtual reality (VR) and augmented reality (AR).

Metaverse: The word ‘Metaverse’ is made up of the prefix ‘meta’ (meaning virtual·beyond) and the stem ‘verse’ (a backformation from ‘universe’), meaning a three-dimensional virtual world. More specifically, it is widely used in the sense of a living and gaming virtual world that can coexist both reality and non-reality in the overall aspects of politics, economy, society, and culture.

Metaverse: A world in which the virtual world and the real world interact and resonate, and social, economic, and cultural activities are carried out in it to create value.

Lage space: A space where a person can walk (free-roam) in a virtual reality space and provide the naturally feeling of such movement. The size of the space is defined according to the number of concurrent users: 5x7m for minimum size for 1-3 users, and 18x18m for 8-10 users.

Large space: A space that can provide a sense of reality in a virtual reality space with 6DoF freedom of all actions performed by people while walking freely. The size of the space is defined according to the number of concurrent users: 5x7m for minimum size for 1-3 users, and 18x18m for 8-10 users.

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| Users | Minimum Size | Optimal Size | m² |
| 2~3 | 5m\*7m | 6m\*8m | 48m² |
| 3~6 | 10m\*10m | 12m\*12m | 144m² |
| 6~8 | 15m\*15m | 16m\*16m | 256m² |
| 8~10 | 18m\*18m | 20m\*20m | 400m² |

Realistic Content: Digital content that can recognize and analyze human behavior such as human gestures, movements, and voices using various sensors and interact with objects in the content while feeling real.

Framework: A system that provides functions in a series of collaborative forms so that designs and implementations corresponding to a specific part of software can be reused.

Interaction: An activity in which characters and objects of content induce feedback such as movement, sound, and manipulation according to the user's action.

Motion tracking: A technique for tracking people moving in real space and applying them to characters in virtual space.

Optical cameras: A camera used to track human motion by projecting an object to the same point from at least two cameras and then inverting the three-dimensional coordinates of the object through triangulation.

IoT(Internet of things): Technique that connects to internet using sensor and communication function built into various things.

HMD (Head Mounted Display): A display device that is combined with 3D display technology and worn mainly on the head for virtual reality or augmented reality implementation. It is a display device equipped with sunglasses-type lenses made of light and thin materials such as LCD and OLED so that objects can be seen from the closest place by mounting them on the head.

Digital twin system: A system that enables the real world to connect and interact with each other by implementing machines, equipment, and objects in the real world equally in the virtual world in the computer.

Haptics: A technology used to verify product design and process design, allowing users to feel reactions or loads to movement using devices that can feel the touch in virtual space.

Tracking server: A server that provides information on the location and direction of objects and people collected from various tracking sensors.

Tracking marker: A marker for recognizing by attaching it to an object or human body to be tracked in a motion capture system. The 'passive marker' is covered with a material that reflects infrared rays generated by the IR camera, and the 'active marker' uses the flashing of the LED itself.

VR Backpack PC: A backpack-shaped PC equipped with high-performance CPUs and GPUs and powered by batteries so that users can freely move around virtual spaces and run VR content with stable frames.

Calibration: A technology that provides more accurate motion tracking by calculating the position and direction of each IR camera used for motion tracking and the degree of distortion of the captured image. These calculations should be performed periodically due to ambient factors such as temperature fluctuations or other environmental conditions that may naturally degrade calibration accuracy over time.

Rigidbody: A collection of three or more markers on objects interconnected with each other, assuming that objects tracked by the IR camera are impossible to deform. Each object can be distinguished by a pattern of three or more markers.

Latency: The delayed time occurring at the runtime of content (e.g., game or simulation) that appears on the screen as a result value when a user performs a task or task.

IMU(Inertial Measurement Unit): A unit device that measure power, angle and ratio using accelerometer and tachometer.

Gloves: Devices for tracking hands

Accelerometer: A sensor for measuring linear acceleration or angular acceleration by measuring inertia-induced reaction.

Device Controller: A physical device that generates an interactive elements in a virtual space through a physical input signal.

Physical space: A space of reality where a substance or object may exist or something can happen.

Virtual space: A space created virtually by computers and the Internet and is not a real world.

Vitual Object: Objects for interaction in virtual space.

* 1. Acronyms and abbreviations

fps frame per second

HMD head-mounted display

IMU inertial measurement unit

6DoF six degrees of freedom

VR virtual reality

AR augmented Reality

MR mixed reality

XR extended reality

1. IEEE Standards Dictionary Online is available at: <http://dictionary.ieee.org>. An IEEE Account is required for access to the dictionary, and one can be created at no charge on the dictionary sign-in page. [↑](#footnote-ref-1)