CitiVerse

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IEEE Metaverse Standards Committee (CTS/MSC)

▸ The first standards committee on metaverse in major global/international SDOs

■ Formerly **IEEE Virtual Reality and Augmented Reality Standards Committee** (CTS/VRARSC)

■ Name change and scope change
  ■ Committee approval: 16 May 2022
  ■ IEEE SASB approval: 21 September 2022

■ New scope:
  ■ The scope of the Standards Committee is to develop and maintain standards, recommended practices, and guides for **metaverse**, virtual reality and augmented reality, using an open and accredited process, and to advocate them on a global basis. Its technical scope is intended to be flexible and is ultimately determined by the sum of its approved PARs.
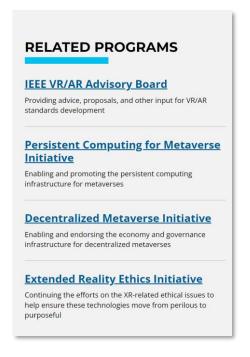
IEEE Metaverse Standards and Projects

‣ Many metaverse-related standards and projects are NOT listed here if their titles do not explicitly include "metaverse"

- P2048 **Standard for Metaverse: Terminology, Definitions, and Taxonomy**
  - Status: Approved by IEEE SASB on 10 November 2022

- P7016 **Standard for Ethically Aligned Design and Operation of Metaverse Systems**
  - Status: Approved by IEEE SASB on 10 November 2022

- P7016.1 **Standard for Ethically Aligned Educational Metadata in Extended Reality(XR) & Metaverse**
  - Status: PAR submitted to IEEE SA

- P3812.1 **Standard for General Requirement for Identity Framework of Metaverse**
  - Status: Approved by IEEE SASB on 3 December 2022

- IC22-012 **Persistent Computing for Metaverse Initiative**
  - Status: Approved by IEEE SA CAG on 12 October 2022

- IC22-015 **Decentralized Metaverse Initiative**
  - Status: Approved by IEEE SA CAG on 12 October 2022

IEEE Standards and Projects for Metaverse *(Continued)*

▸ Please stay tuned at **metaverse.ieee.org**

RELATED PROGRAMS

IEEE VR/AR Advisory Board

Providing advice, proposals, and other input for VR/AR standards development

Persistent Computing for Metaverse Initiative

Enabling and promoting the persistent computing infrastructure for metaverses

Decentralized Metaverse Initiative

Enabling and endorsing the economy and governance infrastructure for decentralized metaverses

Extended Reality Ethics Initiative

Continuing the efforts on the XR-related ethical issues to help ensure these technologies move from perilous to purposeful

RELATED STANDARDS & PROJECTS

METAVERSE

- IEEE P2048 Standard for Metaverse: Terminology, Definitions, and Taxonomy
- IEEE P3812.1 Standard for General Requirements for Identity Framework for Metaverse
- IEEE P7016 Standard for Ethically Aligned Design and Operation of Metaverse Systems

AI: ETHICS, GOVERNANCE, & SPATIAL WEB

- IEEE 3652.1-2020 Guide for Architectural Framework and Application of Federated Machine Learning
- IEEE 2941-2021 Standard for Artificial Intelligence (AI) Model Representation, Compression, Distribution and Management
- IEEE 1232.3-2014 Guide for the Use of Artificial Intelligence Exchange and Service Tie to All Test Environments
- IEEE P2863 Recommended Practice for Organizational Governance of Artificial Intelligence
- IEEE P3128 Recommended Practice for The Evaluation of Artificial Intelligence (AI) Dialogue System Capabilities
- IEEE P3123 Standard for Artificial Intelligence and Machine Learning Terminology and Data Formats
- IEEE 2937-2022 Standard for Performance Benchmarking for AI Server Systems
- IEEE P7015 Standard for Data and Artificial Intelligence (AI) Literacy, Skills, and Readiness
- IEEE P3152 Standard for the Description of the Natural or Artificial Character of Intelligent Communicators
- IEEE P3129 Standard for Robustness Testing and Evaluation of Artificial Intelligence (AI)-based Image Recognition Service
- IEEE P2874 Standard for Spatial Web Protocol, Architecture and Governance
- IEEE P2894 Guide for an Architectural Framework for Explainable Artificial Intelligence
- IEEE P2941.1 Standard for Operator Interfaces of Artificial Intelligence
- IEEE P2247.4 Recommended Practice for Ethically Aligned Design of Artificial Intelligence (AI) in Adaptive Instructional Systems
- IEEE 2807-2022 Framework of Knowledge Graphs Series
- IEEE P2975 Standard for Industrial Artificial Intelligence (AI) Data Attributes
- IEEE P2976 Standard for XAI – eXplainable Artificial Intelligence - for Achieving Clarity and Interoperability of AI Systems Design
- IEEE P3119 Standard for the Procurement of Artificial Intelligence and Automated Decision Systems
- IEEE P7014 Standard for Ethical considerations in Emulated Empathy in Autonomous and Intelligent Systems
- All 7000 Series Projects

AR+VR+MR+ER / HUMAN-MACHINE INTERACTION

- IEEE 1589-2020 Standard for an Augmented Reality Learning Experience Model
- IEEE 3079-2020 Standard for Head Mounted Display (HMD) Based Virtual Reality (VR) Sickness Reduction Technology
- IEEE 3333.1.3-2022 Standard for the Deep Learning-Based Assessment of Visual Experience Based on Human Factors
- IEEE P7030 Recommended Practice for Ethical Assessment of Extended Reality (XR) Technologies
- IEEE P2048.101 Standard for Augmented Reality on Mobile Devices: General Requirements for Software Framework, Components, and Integration
- IEEE P3079.1 Motion to Photon (MTP) Latency in Virtual Environments
- IEEE P3079.2 Mixed Reality (MR) Standard Framework for Motion Learning
- IEEE P3079.2.1 Standard for a Basic Framework for Motion Training System
- IEEE P2888.4 Standard on Architecture for Virtual Reality Disaster Response Training System with Six degrees of Freedom
- IEEE P3333.2.4 Standard for Three-Dimensional (3D) Medical Simulation
- IEEE P1918.1 Tactile Internet: Application Scenarios, Definitions and Terminology, Architecture, Functions, and Technical Assumptions

CLOUD COMPUTING, BLOCKCHAIN, DIGITAL TWIN, BIG DATA, & WEB 3.0

- IEEE 2301-2020 Guide for Cloud Portability and Interoperability Profiles
- IEEE 2302-2021 Standard for Intercloud Interoperability and Federation
- IEEE P3144 Standard for Digital Twin Maturity Model and Assessment Methodology in Industry
- IEEE P1926.1 Standard for a Functional Architecture of Distributed Energy Efficient Big Data Processing
- IEEE P2673 Standard for Patient Digital Biomedical Data Files with 3D Topological Mapping of Macroanatomy and Microanatomy for Use in Big Data and Augmented Intelligence Systems
- IEEE 2813-2020 Standard for Big Data Business Security Risk Assessment
- IEEE P2957 Standard for a Reference Architecture for Big Data Governance and Metadata Management
- IEEE P2304 Standard for Cloud Computing Shared Function Model
- IEEE Blockchain Projects

IEEE Metaverse Congress

- SESSION 0 (PILOT): **FORUM ABOUT THE METAVERSE**
  - 14 June 2022 | Hybrid (Toronto, Canada | Virtual)
- SESSION 1 (KICKOFF): **DEMYSTIFYING AND DEFINING THE METAVERSE**
  - 6 July 2022 | Virtual
- SESSION 2: **THE METAVERSE AND ITS RAPID GROWTH IN CHINA**
  - 9 July 2022 | Virtual
- SESSION 3: **DEVELOPING AND DEPLOYING THE METAVERSE**
  - 27 September 2022 | Virtual
- SESSION 4 (SHENZHEN SUMMIT): **NEW OPPORTUNITIES FROM THE METAVERSE AND THE NEW WAVE OF DIGITAL ECONOMY**
  - 30 September 2022 | Hybrid (Shenzhen, China | Virtual)
- SESSION 5: **BEHIND AND BEYOND THE METAVERSE**
  - 8 December 2022 | Virtual
- SESSION 6: **BEHIND AND BEYOND THE METAVERSE – YEAR-END WRAP-UP**
  - 27 December 2022 | Virtual
- SESSION 7 (DAVOS SPECIAL SESSION): **THE FUTURE OF THE WEB, THE INTERNET, AND THE METAVERSE**
  - 17-19 January 2023 | Hybrid (Davos, Switzerland | Virtual)
- SESSION 8 (BANGALORE SUMMIT): **ONBOARDING METAVERSE – FROM INFRASTRUCTURE TO APPLICATIONS**
  - 6 February 2023 | Hybrid (Bangalore, India | Virtual)
- SESSION 9: **NEW YEAR, NEW MOMENTUM**
  - 14 February 2023 | Virtual
- SESSION 10: **NEW TRENDS, NEW OPPORTUNITIES**
  - 28 February 2023 | Virtual
- SESSION 11: **ADVANCING METAVERSE FOR ECONOMIC GROWTH and SUSTAINABILITY**
  - 14 April 2023 | Hybrid (New York, NY USA | Virtual)
- SESSION 12: **METAVERSE ON THE BRINK OF ACCELERATED GROWTH**
  - 24 April 2023 | Virtual

- SESSION 13 : **AWE USA Special Session: Redefining Web 3.0 and Accelerating Metaverse for Greater Sustainability**
  - 31 May 2023-2 June 2023 | (San Clara , USA)
- SESSION 14: **Shanghai WAIC Summit**
  - 6 July 2023 |(Shanghai, China)
- SESSION 15: **Japan Summit**
  - 26 July 2023 | (Kyoto , Japan)
- More to come…

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Thank You!

IEEE P2048 Metaverse Working Group
https://standards.ieee.org/ieee/2048/11072/

IEEE Metaverse Congress
https://metaverse.ieee.org/

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