General Overview Webinar: Getting Started with Simulation Challenge 2025

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Chair, IEEE Young Professionals Digital Transformation and Innovation Hub Subcommittee

Competition Chair, 2025 IEEE Metaverse Grand Challenge for Simulation-Based Learning

31st May 2025

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Session Agenda

🌐 **Understanding the Metaverse**
Definition, vision, and transformative potential

🎓🏥 **Metaverse in Action: Use Cases in Education & Healthcare**
Real-world implementations and success stories

⚙️ **Foundational Technologies Powering the Metaverse**
VR/AR, AI, blockchain, 3D modeling, and more

🛠️ **Development Tools & Platforms**
Game engines, SDKs, compilers, and open-source frameworks

📚 **Resources for Learning & Development**
Recommended readings, tutorials, and sandbox environments

🏆 **About the 2025 IEEE Metaverse Grand Challenge**
Purpose, goals, and impact of simulation-based learning

🔍 **Challenge Details**
- How to participate
- Theme categories
- Submission format & judging criteria
- Awards & recognition

🎤 **Info - Knowledge-Sharing Webinar Series**
Upcoming dates and expert speakers

❓ **Frequently Asked Questions (FAQs)**
Key clarifications for participants

💬 **Open Q&A Session**

IEEE Metaverse | IEEE young professionals | IEEE FUTURE DIRECTIONS

Calling all Students and Young Professionals:

2025 IEEE Metaverse Grand Challenge for Simulation-Based Learning

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What is the Metaverse ?

A **shared, immersive, and persistent 3D virtual space**

- Users interact in real time via **avatars** and **digital objects**
- Built on technologies like:
  - 🌐 Internet & cloud computing
  - 🥽 Virtual / Augmented Reality (VR/AR)
  - 🤖 Artificial Intelligence (AI)
  - 🔗 Blockchain & digital assets

Key Applications:

- 👥 **Social Interaction:** Virtual communities and events
- 🎮 **Gaming:** Interactive, multiplayer environments
- 🎓 **Education & Training:** Simulated learning and virtual classrooms
- 💼 **Professional Collaboration:** Virtual offices and 3D workspaces

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  - Internet
  - Virtual
  - Artifici
  - Blockc

The metaverse can **mirror the real world** or create **entirely new digital realities**, transforming how we **live, learn, and connect**.

Key Applications:

- **Social Interaction:** Virtual communities and events
- **Gaming:** Interactive, multiplayer environments
- **Education & Training:** Simulated learning and virtual classrooms
- **Professional Collaboration:** Virtual offices and 3D workspaces

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Metaverse – Examples

- Imagine entering a **vast virtual shopping mall** within the metaverse
- Users can:
  - **Buy digital items** (e.g., fashion, art, collectibles)
  - **Trade or sell them** across different virtual worlds or platforms

Interoperability in Action:

- Purchase a unique virtual item in one platform
- Later, **resell it** on:
  - Another metaverse space (**Decentraland, Boson Protocol**)
  - Marketplaces like **eBay**, **OpenSea**, or even **social media platforms** (e.g., Twitter/X)

This highlights a **key feature** of the metaverse:
Seamless ownership, transfer, and monetization of digital assets across multiple ecosystems.

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Metaverse in Education – Real-World Examples

🌐 VictoryXR: Digital Twin Campuses

- **VictoryXR** creates "*digital twin*" campuses, offering virtual replicas of real-world institutions.
- These environments include interactive classrooms, laboratories, and libraries, accessible via VR headsets or standard web browsers.
- Features like AI-driven avatars and virtual simulations enhance the learning experience.

VR Simulators Create Hands-on Practice

Simulators and Simulations in virtual reality provide hands-on practice in a 3D world designed to replicate the real thing. The best thing for you, is that the cost of creating simulators and simulations has plummeted, especially with the VXRLabs platform.

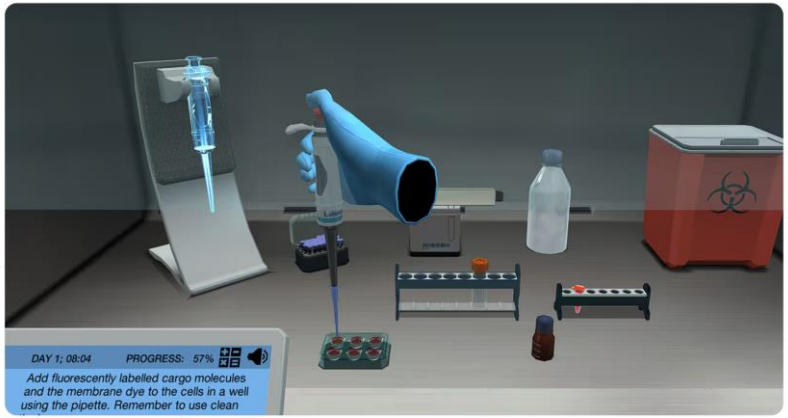
Learn More

Source: https://www.victoryxr.com/metaversity/

Metaverse in Education – Real-World Examples

🧪 **Labster: Virtual Science Laboratories**

- **Labster** provides interactive virtual labs for subjects like biology, chemistry, and physics.
- Students can conduct experiments in a risk-free environment, allowing for exploration of complex scientific concepts.
- This platform is particularly beneficial for institutions lacking physical lab resources.



Source: https://www.labster.com/

Metaverse in Education – Real-World Examples

Google Expeditions: Virtual Field Trips

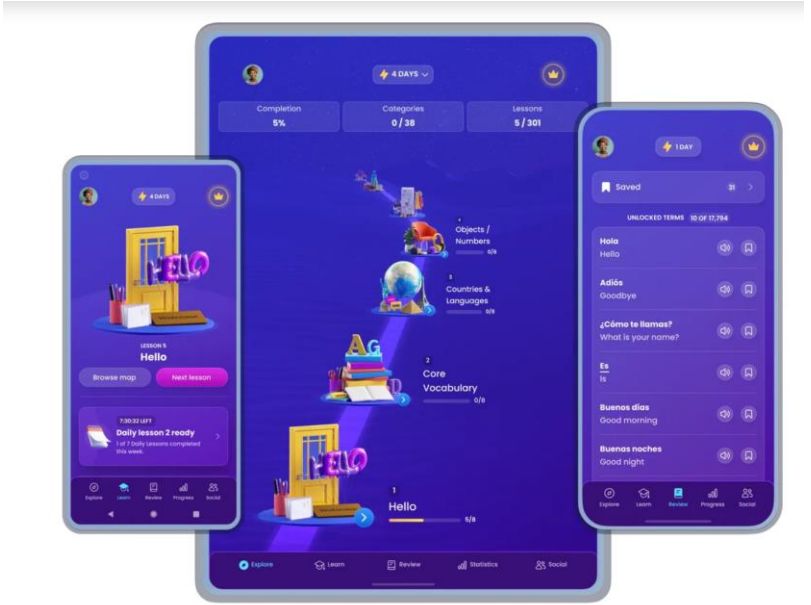
- **Google Expeditions** enabled students to embark on virtual field trips to museums, historical sites, and natural wonders worldwide.
- Using VR headsets (Google Cardboard), learners could explore over 900 destinations, enhancing cultural understanding and engagement.
- Although the standalone app was discontinued in 2021, its content has been integrated into Google Arts & Culture.

Source: https://sites.google.com/view/virtuarealities/vr-resources/google-expeditions

Metaverse in Education – Real-World Examples

🥽 Mondly VR: Language Immersion

- **Mondly VR** offers immersive language learning experiences by simulating real-life conversations with virtual characters.
- This approach enhances pronunciation, vocabulary, and conversational skills in a contextual setting.
- Available in multiple languages, it is a valuable tool for both beginners and advanced learners.



Source: https://www.mondly.com/

Metaverse in Education – Real-World Examples

🧬 zSpace: Augmented Reality in STEM Education

- **zSpace** provides AR/VR learning stations that allow students to interact with 3D models in subjects like anatomy, physics, and engineering.
- The platform combines head-tracking technology with a stylus for an interactive learning experience without the need for VR headsets.
- Widely adopted in K–12 and higher education institutions.

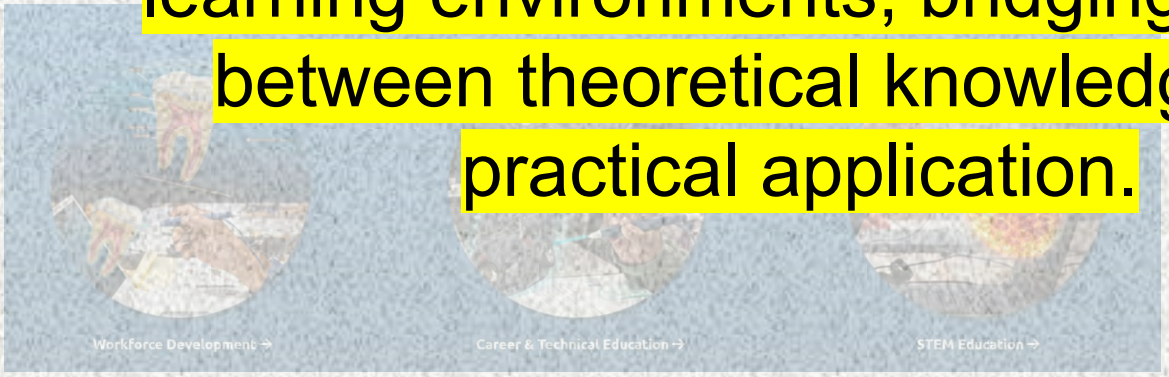
Source: https://zspace.com/

Metaverse in Education – Real-World Examples

zSpace: Augmented Reality in STEM Education

- **zSpace** provides [illegible] with 3D models in subjects like anatomy, [illegible]
- The platform [illegible] learning experience without [illegible]
- Widely [illegible]

The integration of metaverse technologies in education fosters immersive, interactive, and accessible learning environments, bridging the gap between theoretical knowledge and practical application.



Source: https://zspace.com/

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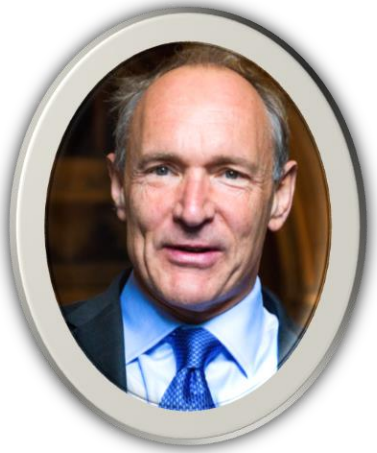
History of Metaverse

The term ***metaverse*** was coined in **1992** by **Neal Stephenson**, though its foundations trace back to **1989** with the invention of the **World Wide Web** by **Tim Berners-Lee**. By the **2020s**, it became an immersive digital space enabled by **VR**, **AR**, **blockchain**, and the **internet of things (IoT)**. Milestones include *Second Life* (2003) and Meta's rebranding in **2021**.



Tim Berners-Lee

Neal Stephenson

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History of Metaverse

1989 — Tim Berners Lee invents the *World Wide Web* (www)

1992 — Science fiction writer Neal Stephenson uses the term *'metaverse'* to describe a 3-D virtual space

2006 — *Roblox*, an online platform that allows users to create and share games with others, is introduced

2009 — *Bitcoin*, the world's first successful cryptocurrency and blockchain platform is created

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History of Metaverse

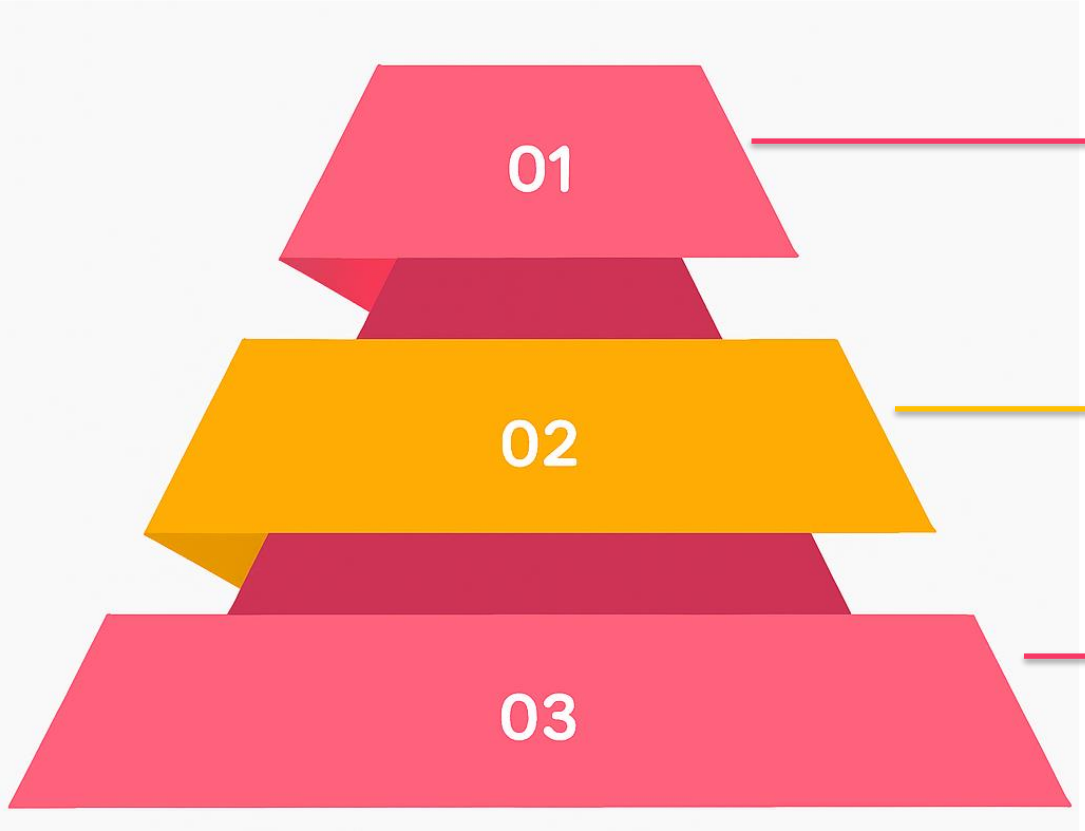
2014 — *Facebook* acquires virtual reality hardware and platform *Oculus*

2016 — *Pokemon Go*, a game that uses augmented reality technology, takes the world by storm

2021 — *Microsoft* unveils *Mesh*, a platform designed for virtual collaboration across multiple devices

Mark Zuckerberg says *Facebook's* parent company would adopt the name *Meta* and unveils plans for their metaverse.

Why it Matters?



It could be the next internet

Work and Collaboration could consistently move into Metaverse

Exciting Opportunities

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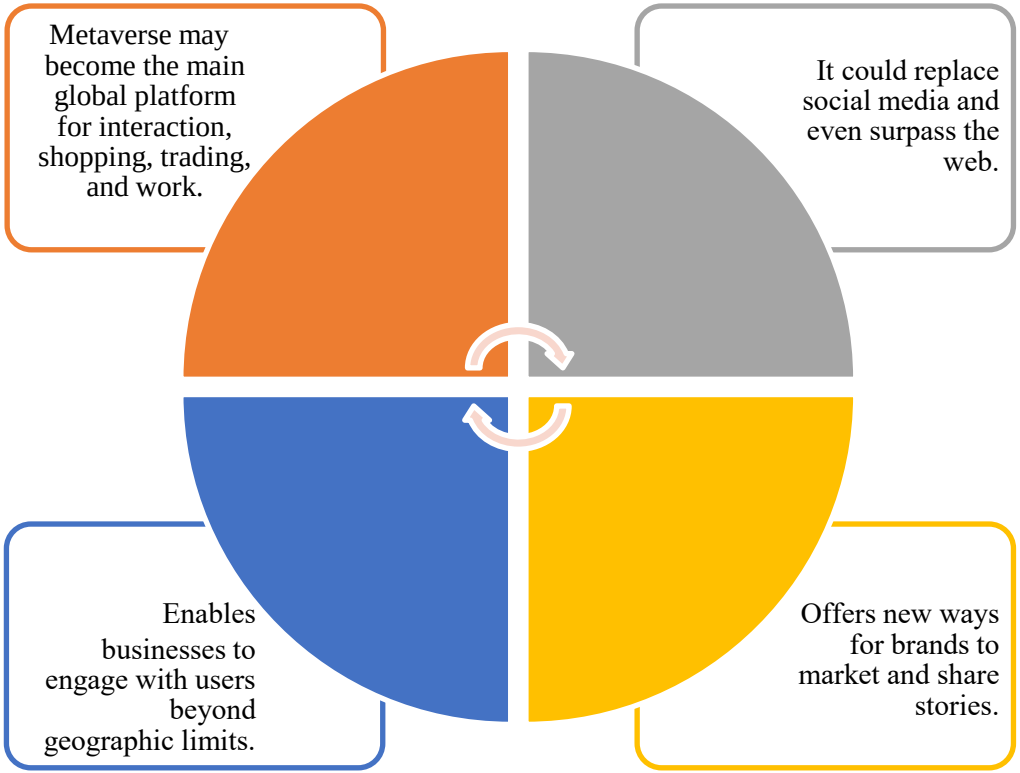
Why Metaverse? – *It could be the Next Internet*

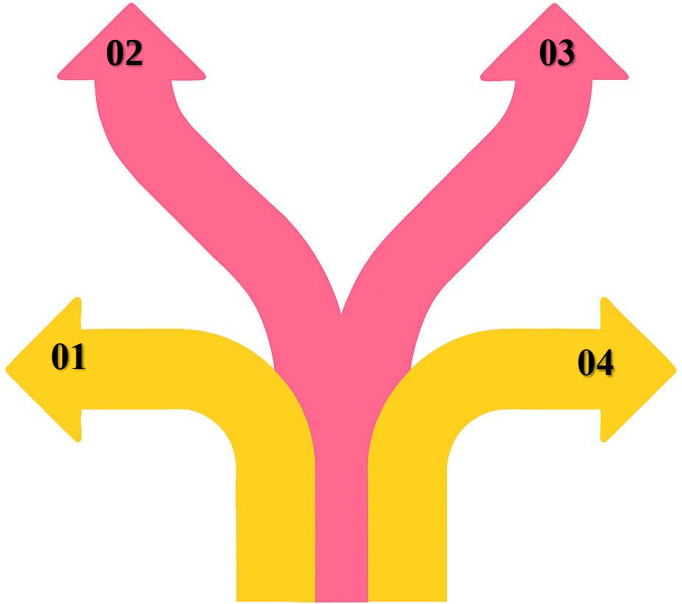


Why Metaverse?

Work and Collaboration will Steadily Move into Metaverse

Future hybrid workplaces may become 3D metaverse-based offices where remote and in-office staff interact equally in real time.

Avatars could represent employees in virtual offices powered by AR, VR, and digital twins, integrated with third-party tools for immersive experiences.



Organizations are restructuring based on evolving employee expectations.

These technologies are able to support hybrid work adaptation and ensure equal engagement for remote and on-site employees.

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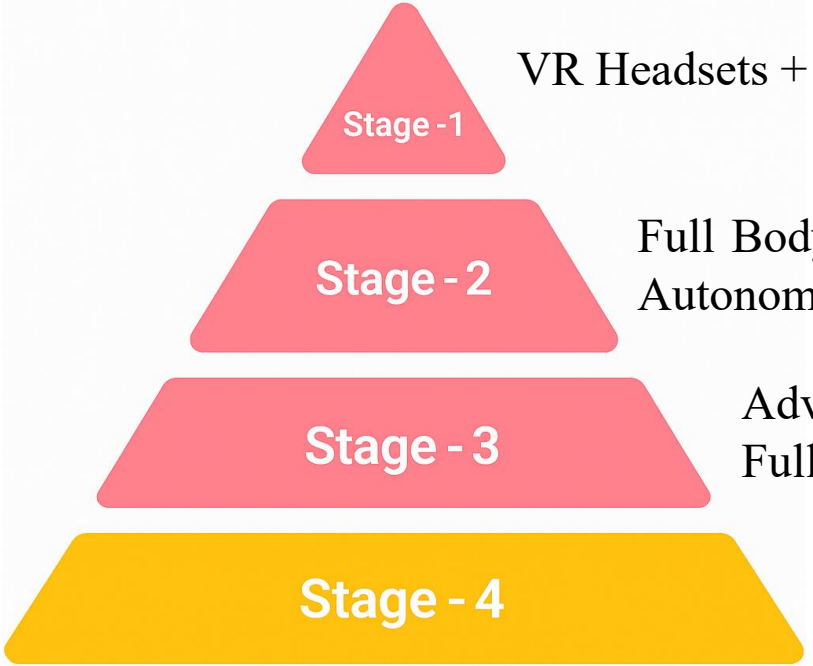
Metaverse – Four Stages



VR Headsets + Web 3.0

Full Body VR + Full Web and DAOs (Decentralized Autonomous Organization)

Advanced VR Neurotech, Full Immersion, and Full Decentralization

Metaverse and Real World becomes indistinguishable

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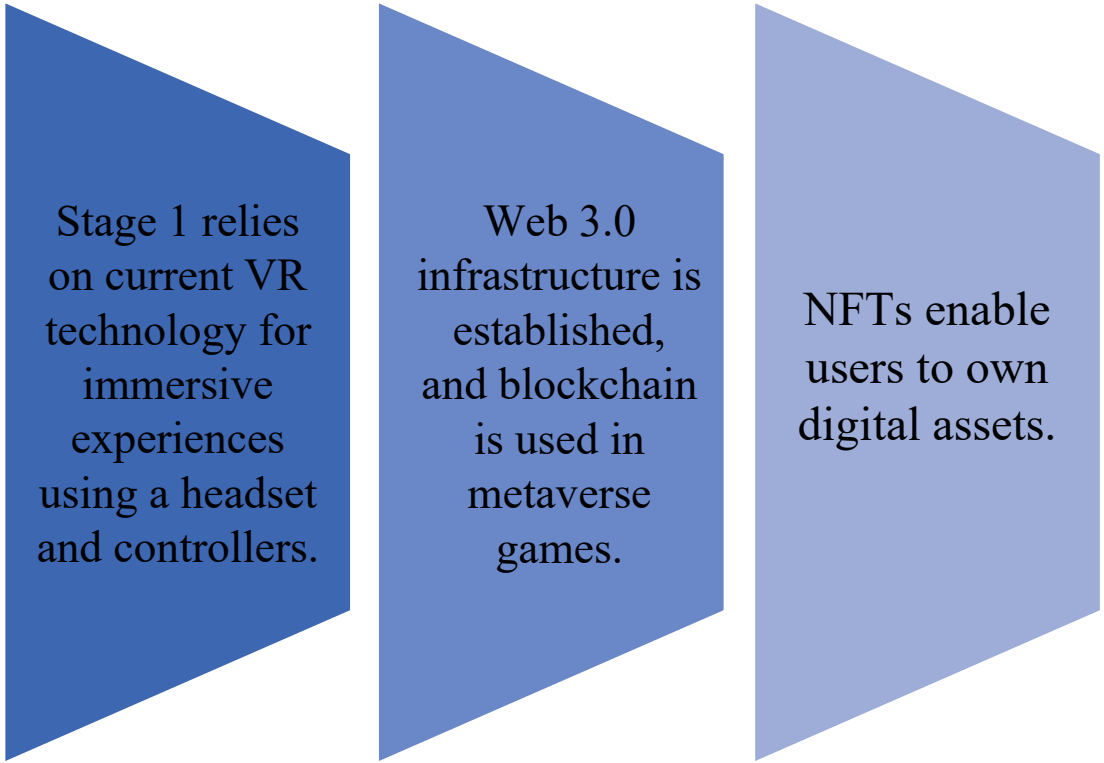
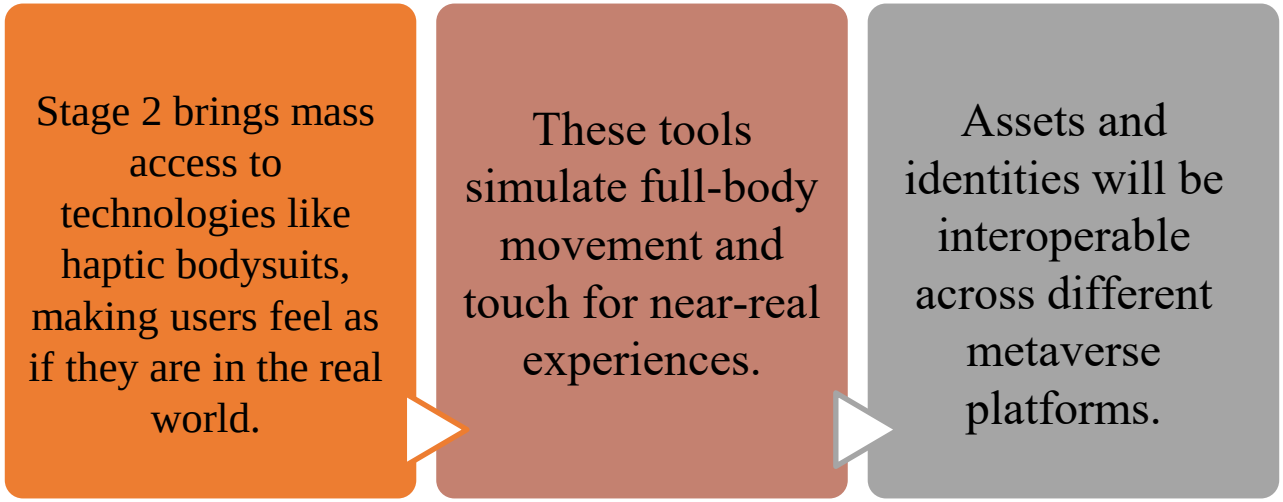
Metaverse – Stage 1



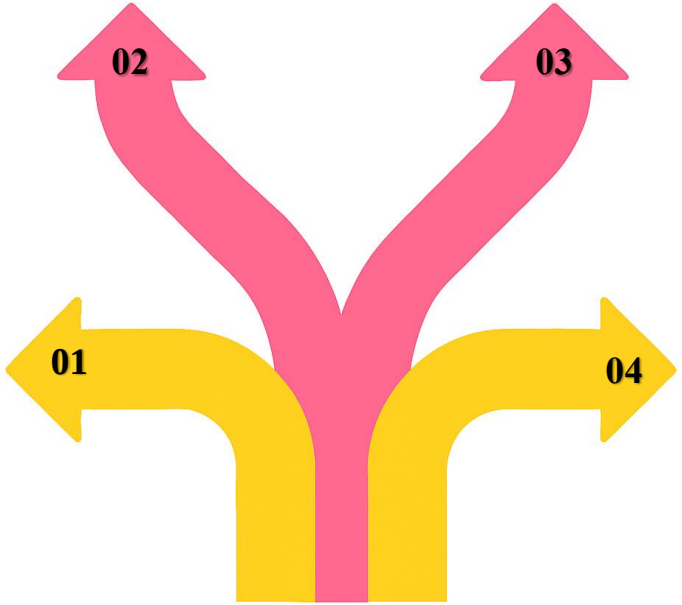
Metaverse – Stage 2



Metaverse – Stage 3

Daily life will fully integrate with immersive virtual environments.

People will form deep relationships in the metaverse.



Advanced neurohaptic VR will enable users to transfer consciousness through realistic brain-based experiences.

Virtual citizenship and democratic digital governments will emerge, with real-world governments establishing presence.

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How It Works?

- *Metaverse* is a digital network built for social interaction in virtual environments.
- It uses **VR**, **AR**, **blockchain**, and **mobile internet** to enable immersive experiences.
- Users experience **3D virtual** spaces through headsets and connected devices.
- VR is essential to blend digital and real-world elements.
- Immersive experiences engage users with visuals, sound, and interaction.
- Common uses include concerts, meetings, movies, and learning activities.

Core Technologies Behind the Metaverse

Blockchain

Augmented Reality (AR)

Internet of Things (IoT)

Virtual Reality (VR)

Artificial Intelligence (AI)

3D Reconstruction

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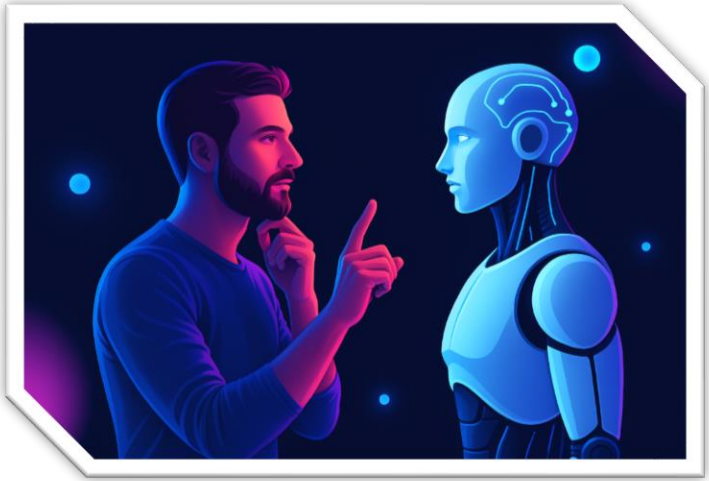
Blockchain

Blockchain enables a decentralized network for virtual worlds and 3D spaces in the Metaverse. It allows users to create their own environments and connect in various aspects of life.

Artificial Intelligence (AI)

AI is the ability of a computer or a computer-controlled robot to perform tasks that are usually done by humans as they require human intelligence.

- Avatars
- Digital Humans
- Language Processing



Virtual Reality (VR)

VR is a 3D computer-generated environment that replicates real or imaginary worlds using sounds, visuals, and sensations through devices like headsets, gloves, and body sensors.

3D Reconstruction & Internet Of Things

3D reconstruction creates digital 3D objects in virtual spaces. IoT enables smart devices, like appliances and vehicles, to connect and share data via the internet. In the Metaverse, this connection helps mirror real-world objects and their real-time changes. For accuracy and security, proper safeguards must be in place to prevent cyber threats.

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Practical Applications of the Metaverse

- Healthcare
- Education
- Real Estate
- Sustainability
- Manufacturing
- Gaming
- Banking & Finance

Metaverse in Healthcare – Real-World Examples

1. Medical Training Simulations

- **Implementation**: *Virti* offers VR-based training for medical professionals to practice procedures.
- **Technologies Used**: VR simulations, AI analytics, and haptic feedback devices.

Source: https://www.virti.com/

2. Remote Surgical Assistance

- **Implementation**: *Proximie* enables surgeons to collaborate remotely using AR technology.
- **Technologies Used**: Augmented reality, real-time video streaming, and collaborative tools.

Source: https://www.proximie.com/

Metaverse in Healthcare – Real-World Examples

3. Virtual Therapy and Rehabilitation

- **Implementation**: *Immersive Rehab* provides VR-based physical therapy programs for patients.
- **Technologies Used**: Motion tracking, VR environments, and personalized exercise routines.

Source: https://immersiverehab.com/

🛠️ Tools & Platforms for Metaverse Development

1. Game Engines

- **Unity**: A versatile game engine supporting C# scripting, widely used for creating 3D environments and interactive experiences 🔗 Unity: https://unity.com/
- **Unreal Engine 5**: Known for high-fidelity graphics and real-time rendering, it uses C++ and the Blueprint visual scripting system. 🔗 Unreal Engine: https://www.unrealengine.com/en-US

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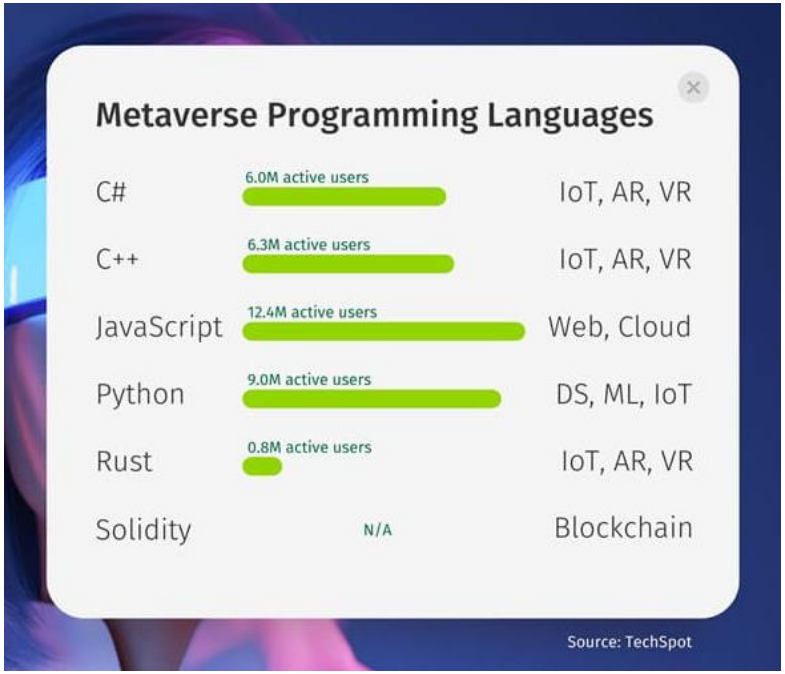
Tools & Platforms for Metaverse Development

2. Programming Languages

- **C#**: Used primarily with Unity for scripting game logic and interactions.
- **C++**: Employed with Unreal Engine for performance-critical applications.
- **JavaScript**: Utilized in web-based metaverse platforms and for scripting in WebXR applications.
- **Python**: Data analytics or visualization purpose.



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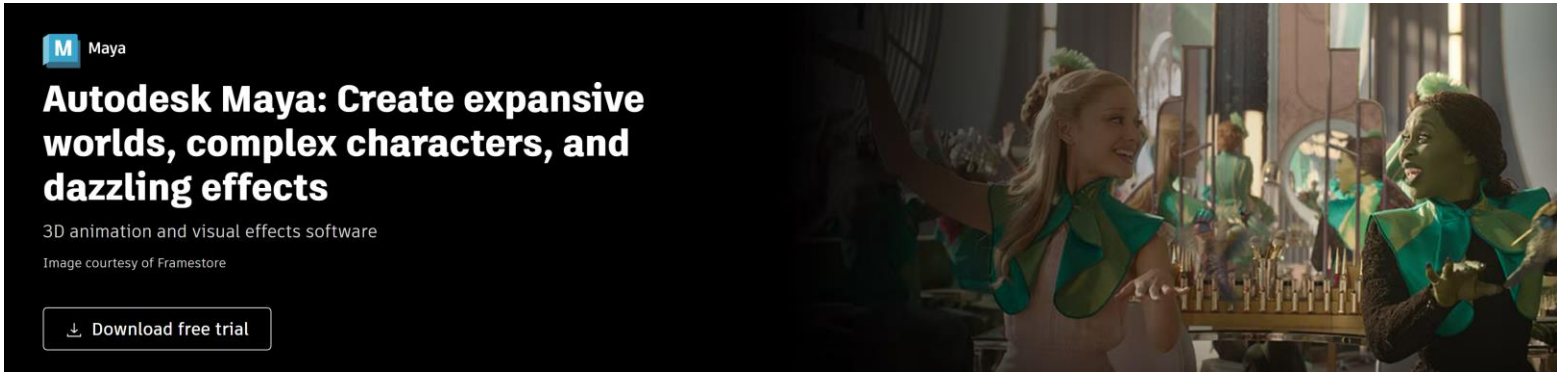
🛠 Tools & Platforms for Metaverse Development

3. 3D Modeling and Animation Tools

- **Blender**: An open-source 3D creation suite supporting modeling, rigging, animation, simulation, rendering, and more.
  📎 Blender: https://www.blender.org/
- **Autodesk Maya**: A professional 3D software for creating realistic characters and blockbuster-worthy effects.
  📎 Maya: https://www.autodesk.com/products/maya/overview



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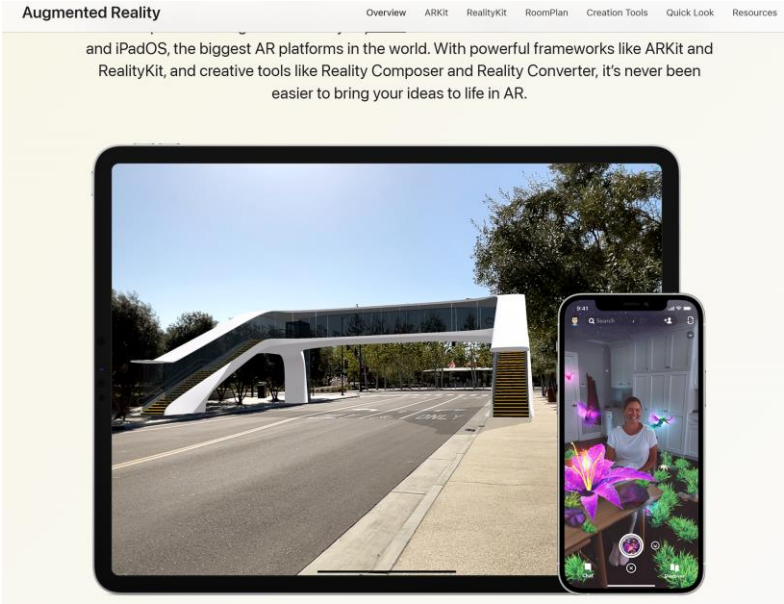
🛠 Tools & Platforms for Metaverse Development

4. Virtual Reality (VR) and/or Augmented Reality (AR) Development

- **VRTK (VR Toolkit)**: A collection of useful, reusable solutions to common problems found when building VR solutions.
  📎 VRTK: https://github.com/ExtendRealityLtd/VRTK
- **ARCore and ARKit**: Google's and Apple's platforms for building AR applications on Android and iOS, respectively.
  📎 ARCore | ARKit: https://developers.google.com/ar; https://developer.apple.com/augmented-reality/



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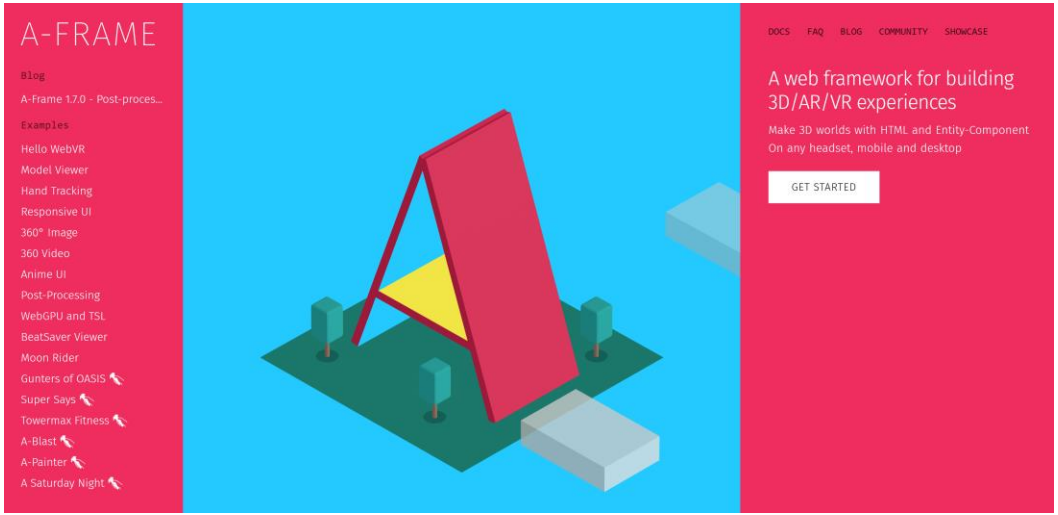
🛠 Tools & Platforms for Metaverse Development

5. Web-Based Metaverse Frameworks

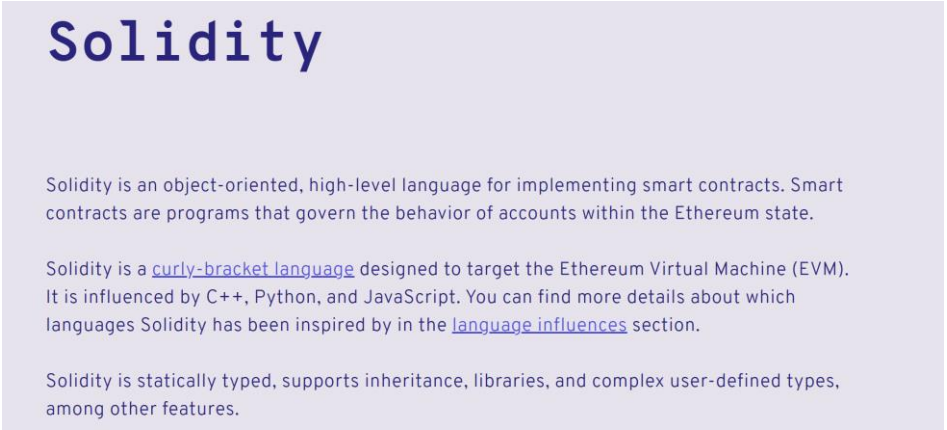
- **A-Frame**: A web framework for building virtual reality experiences, based on HTML and JavaScript.
  🔗 A-Frame: https://aframe.io/
- **Three.js**: A JavaScript library that makes creating 3D content in the browser straightforward.
  🔗 Three.js: https://threejs.org/



🛠 Tools & Platforms for Metaverse Development

6. Blockchain and Smart Contract Platforms

- **Ethereum**: A decentralized platform for building and deploying smart contracts and dApps.
  📎 Ethereum: https://ethereum.org/en/
- **Solidity**: A programming language for writing smart contracts on Ethereum.
  📎 Solidity: https://docs.soliditylang.org/en/v0.8.30/



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Further Reading and Tutorials

- **Building a Metaverse Platform: Tools & Frameworks Guide**
  An in-depth guide covering essential steps and tools for creating a metaverse platform.
  📎 Read the guide: https://github.com/M3-org/awesome-metaverse
- **Metaverse Development Tools**
  A comprehensive list of tools to assist developers in building, testing, and deploying metaverse applications.
  📎 Explore the tools: https://github.com/topics/metaverse-tool?o=asc&s=stars
- **How to Develop for Metaverse? Skills, Technologies, Tools**
  An article discussing the necessary skills and technologies for metaverse development.
  📎 Learn more: https://link.springer.com/article/10.1007/s10639-023-12167-9

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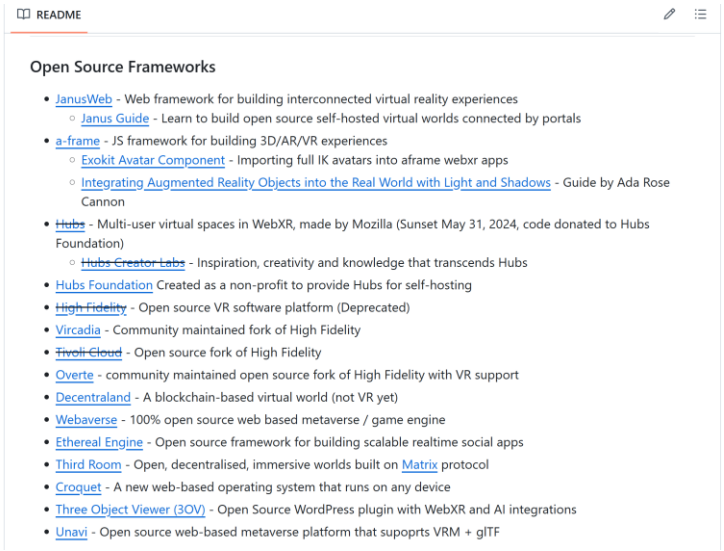

README

Open Source Frameworks

- JanusWeb - Web framework for building interconnected virtual reality experiences
  - Janus Guide - Learn to build open source self-hosted virtual worlds connected by portals
- a-frame - JS framework for building 3D/AR/VR experiences
  - Exokit Avatar Component - Importing full IK avatars into aframe webxr apps
  - Integrating Augmented Reality Objects into the Real World with Light and Shadows - Guide by Ada Rose Cannon
- ~~Hubs~~ - Multi-user virtual spaces in WebXR, made by Mozilla (Sunset May 31, 2024, code donated to Hubs Foundation)
  - ~~Hubs Creator Labs~~ - Inspiration, creativity and knowledge that transcends Hubs
- Hubs Foundation Created as a non-profit to provide Hubs for self-hosting
- ~~High Fidelity~~ - Open source VR software platform (Deprecated)
- Vircadia - Community maintained fork of High Fidelity
- ~~Tivoli Cloud~~ - Open source fork of High Fidelity
- Overte - community maintained open source fork of High Fidelity with VR support
- Decentraland - A blockchain-based virtual world (not VR yet)
- Webaverse - 100% open source web based metaverse / game engine
- Ethereal Engine - Open source framework for building scalable realtime social apps
- Third Room - Open, decentralised, immersive worlds built on Matrix protocol
- Croquet - A new web-based operating system that runs on any device
- Three Object Viewer (3OV) - Open Source WordPress plugin with WebXR and AI integrations
- Unavi - Open source web-based metaverse platform that supoprts VRM + glTF

Open Source Tools

- Blender - #1 open tool for 3D creation, modeling, and much more
  - Hubs Blender Exporter
  - Webaverse Blender Exporter
  - Godot Blender Exporter
  - Babylonjs Blender Exporter
  - Sketchfab plugin
  - Polyhaven
- Spoke - Easily create custom 3D environments
- Open Brush - Derivative made from the open source code of Tilt Brush
- Three.js editor - Web editor for three.js
- Babylonjs editor - Web editor for babylon.js

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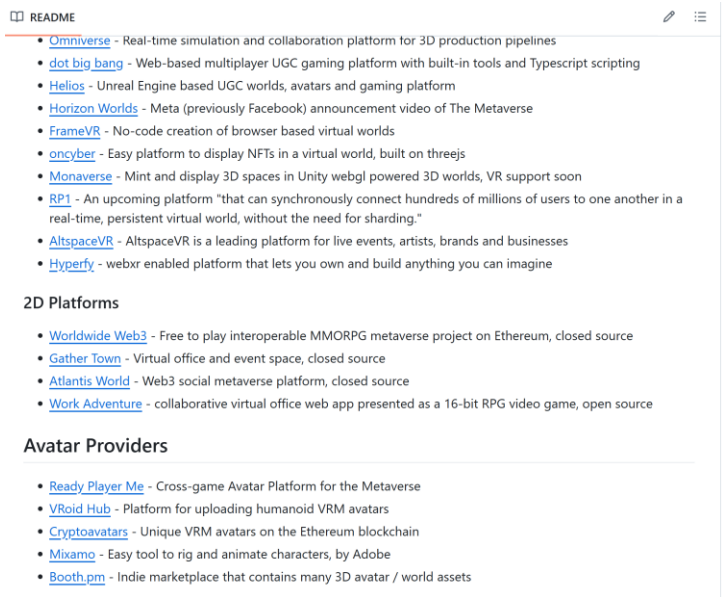


README

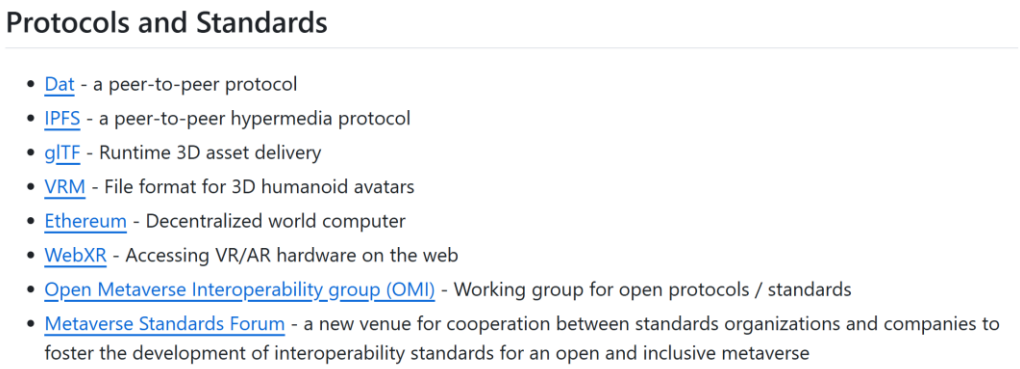
- Omniverse - Real-time simulation and collaboration platform for 3D production pipelines
- dot big bang - Web-based multiplayer UGC gaming platform with built-in tools and Typescript scripting
- Helios - Unreal Engine based UGC worlds, avatars and gaming platform
- Horizon Worlds - Meta (previously Facebook) announcement video of The Metaverse
- FrameVR - No-code creation of browser based virtual worlds
- oncyber - Easy platform to display NFTs in a virtual world, built on threejs
- Monaverse - Mint and display 3D spaces in Unity webgl powered 3D worlds, VR support soon
- RP1 - An upcoming platform "that can synchronously connect hundreds of millions of users to one another in a real-time, persistent virtual world, without the need for sharding."
- AltspaceVR - AltspaceVR is a leading platform for live events, artists, brands and businesses
- Hyperfy - webxr enabled platform that lets you own and build anything you can imagine

2D Platforms

- Worldwide Web3 - Free to play interoperable MMORPG metaverse project on Ethereum, closed source
- Gather Town - Virtual office and event space, closed source
- Atlantis World - Web3 social metaverse platform, closed source
- Work Adventure - collaborative virtual office web app presented as a 16-bit RPG video game, open source

Avatar Providers

- Ready Player Me - Cross-game Avatar Platform for the Metaverse
- VRoid Hub - Platform for uploading humanoid VRM avatars
- Cryptoavatars - Unique VRM avatars on the Ethereum blockchain
- Mixamo - Easy tool to rig and animate characters, by Adobe
- Booth.pm - Indie marketplace that contains many 3D avatar / world assets



Protocols and Standards

- Dat - a peer-to-peer protocol
- IPFS - a peer-to-peer hypermedia protocol
- glTF - Runtime 3D asset delivery
- VRM - File format for 3D humanoid avatars
- Ethereum - Decentralized world computer
- WebXR - Accessing VR/AR hardware on the web
- Open Metaverse Interoperability group (OMI) - Working group for open protocols / standards
- Metaverse Standards Forum - a new venue for cooperation between standards organizations and companies to foster the development of interoperability standards for an open and inclusive metaverse

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2025 IEEE Metaverse Grand Challenge for Simulation-Based Learning

IEEE Metaverse
IEEE FUTURE DIRECTIONS
IEEE young professionals

IEEE
Advancing Technology for Humanity

IEEE Metaverse | IEEE youngprofessionals | IEEE FUTURE DIRECTIONS

Calling all Students and Young Professionals:

2025 IEEE Metaverse Grand Challenge for Simulation-Based Learning

Competition Overview:

The 2025 IEEE Metaverse Grand Challenge for Simulation-Based Learning aims to foster simulation-driven learning experiences on 2D or 3D metaverse platforms, allowing users to interactively engage with concepts, processes, and problem-solving scenarios.

Participants will have the creative freedom to develop immersive simulations that can enhance the learning and training experience. Participants must select one of the following themes to guide their simulation development:

- Healthcare Applications in Digital Learning
- Sustainable Smart Cities and Urban Innovation
- Advanced Learning in Educational or Classroom Environment

All entrants must be a student from an accredited university or a Young Professional who has graduated with their first professional degree within the past 15 years. Teams may consist of a mix of students and YPs.

Submission Deadline: 1 September 2025

Prizes:

First-Place Awards (Travel Grants): Each of the two (2) winning teams will receive up to $2,500 in travel expenses to attend the 2025 IEEE International Symposium on Emerging Metaverse (ISEMV 2025) in Honolulu, Hawaii, USA (or another event to be determined by the IEEE Metaverse Initiative).

Second-Place Awards: Each of the two (2) winning teams will receive premium backpacks featuring the IEEE Metaverse and YP logos, along with a certificate of achievement.

*Awards will be given only if a suitable awardee is identified.

Are you ready to shape the future of simulation-based learning?

For any additional questions or concerns, contact isemv@ieee.org.

Learn more at: https://bit.ly/4igbnPi

Website

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Competition Overview

2025 IEEE Metaverse Grand Challenge for Simulation-Based Learning

Competition Overview

Participants will have the creative freedom to develop immersive simulations that model key processes and innovations in education. The challenge focuses on designing engaging, interactive simulations that can enhance the learning and training experience for Young Professionals (YPs) and students

All entrants must be a students from an accredited university or YPs who have graduated with their first professional degree within the past 15 years. Teams may consist of a mix of students and YPs.

- Please complete **this form** to indicate your interest in participating.
- Then, stay tuned for two upcoming knowledge webinars where we'll provide guidance and answer your questions as you develop your immersive environments.

Download official contest rules (PDF, 206 KB)

Website

Official Contest Rules

Express of Interest Form

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Objective

The challenge aims to foster **simulation-driven learning experiences on 2D or 3D metaverse platforms**, allowing users to interactively engage with concepts, processes, and problem-solving scenarios. Participants will **design, simulate, and showcase emerging technology using real-time, AI-enhanced, and/or user-adaptive simulations**. The goal is to create **scalable, immersive, and globally accessible educational tools** that transform learning.

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How to Participate

To express your interest in the contest, please register online at:

🖇 https://metaversereality.ieee.org/competition

To officially take part in the competition, you must submit **your team's project materials** during the designated submission period.

Team Guidelines:

- Teams may consist of **1 to 5 individuals**.
- Each participant may **only join one team**.
- A complete **list of team members** must be included with the project submission.
- **Team members cannot be changed** after the submission is finalized.

The **submission portal** will be made available following the **Knowledge-Sharing Webinar Series**.
🗓 **Submission Deadline: September 1st, 2025**

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Challenge Overview – Theme Categories

Simulation-Based Approach:

Teams will have the **creative freedom** to develop **immersive simulations** that model key processes and innovations for simulation-learning purpose. The focus is on designing engaging, interactive simulations that can **enhance the learning and training experience for YPs and students**.

Theme Categories

Participants must select one of the following themes to guide their simulation development:

1. Healthcare Applications in Digital Learning

- Simulating patient interactions, surgical procedures, and/or medical training in immersive environments.
- Exploring AI-driven diagnostics, wearable health tech, and/or virtual hospital management simulations.

2. Sustainable Smart Cities and Urban Innovation

- Highlighting sustainability principles through virtual laboratories and/or eco-friendly innovations.
- Demonstrating energy-efficient systems, recycling methodologies, and/or sustainability analytics in educational settings.
- Public safety infrastructure, including smart surveillance, emergency response systems, and/or disaster resilience planning.

3. Advanced Learning in Educational or Classroom Environment

- Simulating AI-driven personalization in education, including adaptive learning systems.
- Exploring smart classroom concepts, immersive collaboration spaces, and/or AI-powered instructional tools.
- Focusing on inclusive, accessible, and future-ready learning environments.

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View inspiration to spark your ideas!

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Inspiration for Your Ideas:

Explore the transformative potential of simulation-driven education with AI, digital twins, and/or immersive learning environments on a 2D or 3D metaverse platform. Here are a few inspirations:

- **Process Simulation**
  - Leverage AI to create dynamic, interactive models of educational processes—think **STEM experiments, virtual physics labs, or AI-driven decision-making tools**.
  - Enhance simulations with **digital twin platforms**, enabling real-time mirroring of educational environments.
  - Provide **instant feedback and automated corrections**, allowing learners to experiment, **experience failures, and troubleshoot errors in a risk-free setting**.
- **AI-Driven Personalization:**
  - Integrate **adaptive learning algorithms** to customize content based on learner progress.
  - Deploy **AI tutors and chatbots** that offer real-time guidance and explanations.
  - Use **engagement analytics** to adjust content difficulty dynamically, ensuring an optimized learning experience for every user.
- **Interactive Problem-Solving:**
  - Design **real-world challenges** inspired by industry and academia that require hands-on virtual problem-solving.
  - Implement **decision-making scenarios** where users' choices influence simulation outcomes.
  - Introduce **scoring mechanisms** based on accuracy, efficiency, and sustainability, driving learners toward data-driven decision-making.
- **Gamification Elements:**
  - Boost engagement through **reward-based learning** with badges, points, and skill levels.
  - Challenge learners with **time-sensitive tasks** to test problem-solving efficiency.
  - Integrate **leaderboards** to encourage competitive learning, fostering peer collaboration and motivation.
- **Multi-User Collaboration:**
  - Enable **real-time teamwork** in virtual environments, allowing educators, researchers, and students to collaborate on problem-solving.
  - Develop interactive **mentoring sessions and guided demonstrations**, creating immersive learning experiences that break geographical barriers.
- **Sustainability and Ethical Considerations:**
  - Simulate **energy-efficient educational models and sustainable learning techniques** to foster environmentally conscious education.
  - Implement **analytics-driven insights** to measure sustainability impact.
  - Explore **ethical challenges in AI-powered education**, addressing bias, transparency, and responsible AI use in the learning ecosystem.

Challenge Overview – Inspiration for Your Ideas

View inspiration to spark your ideas!

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Further Reading and Tutorials

- **Building a Metaverse Platform: Tools & Frameworks Guide**
  An in-depth guide covering essential steps and tools for creating a metaverse platform.
  📎 Read the guide: https://github.com/M3-org/awesome-metaverse
- **Metaverse Development Tools**
  A comprehensive list of tools to assist developers in building, testing, and deploying metaverse applications.
  📎 Explore the tools: https://github.com/topics/metaverse-tool?o=asc&s=stars
- **How to Develop for Metaverse? Skills, Technologies, Tools**
  An article discussing the necessary skills and technologies for metaverse development.
  📎 Learn more: https://link.springer.com/article/10.1007/s10639-023-12167-9

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Competition Overview – Submission Format

Submission Format

1. PowerPoint Presentation (up to 5 slides):

- Clearly indicate the selected theme.
- Provide a brief implementation design overview.
- Highlight key technology elements that enhance education and learning experiences.

2. Video Recording (5-7 minutes, MP4 format):

- Showcase your project in an engaging format.
- Highlight elements that should be considered in the evaluation process.

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Competition Overview – Judging Criteria

Submission Deadline: 1 September 2025

Judging Criteria:

Submissions will be evaluated based on the following:

Criteria	Weight
Effectiveness of Simulation-Based Learning	25%
Creativity & Innovation	20%
Educational Impact and/or Learning Effectiveness	20%
User Experience (UI/UX) & Engagement	15%
Integration of AI, Gamification, and/or Adaptive Learning	10%
Sustainability, Accessibility, and/or Ethical Considerations	10%

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Competition Overview – Prizes

Prizes

First-Place Awards (Travel Grants): Up to two (2) winners will receive **US$2,500** in travel expenses to attend the **2025 IEEE International Symposium on Emerging Metaverse (ISEMV 2025)**, co-located with the **2025 International Conference on Computer Vision (ICCV 2025)** in Honolulu, Hawaii, USA (or another IEEE Metaverse Initiative event).

Second-Place Awards: Up to two (2) winners will receive a premium backpack featuring the IEEE Metaverse and YP logos, along with a certificate of achievement.

**Awards will only be granted if suitable winners are identified.*

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Upcoming Knowledge-Sharing Webinars

Webinar 1: Immersive Innovation for Smart Cities / SusTech – From Virtual Labs to Sustainable Futures
Theme: Sustainable Smart Cities and Urban Innovation
Date: 7 June 2025 (Saturday)
Duration: 45 mins + 15 mins Q&A
Time: 9AM ET / 3PM CEST / 6:30 PM IST / 10PM JST
Register Now

Webinar 2: Designing Digital Healthcare Experiences – Simulation Concepts That Save Lives
Theme: Healthcare Applications in Digital Learning
Date: 8 June 2025 (Sunday)
Duration: 45 mins + 15 mins Q&A
Time: 9AM ET / 3PM CEST / 6:30 PM IST / 10PM JST
Register Now

Webinar 3: Building the Future of Learning – Simulation Ideas for Smart Classrooms
Theme: Advanced Learning in Educational or Classroom Environment
Date: 8 June 2025 (Sunday)
Duration: 45 mins + 15 mins Q&A
Time: 10:30AM ET / 4:30 PM CEST / 8PM IST / 11:30 PM JST
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Upcoming Knowledge-Sharing Webinar - 1

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Presentation Title: Simulations as Catalysts for Sustainable Smart Cities

Abstract: This presentation highlights the pivotal role of simulation technologies in shaping sustainable and intelligent urban development. Through case studies, it highlights the role of energy modeling, microclimate analysis, and digital workflows in optimizing building performance and informing early design decisions. The session emphasizes the power of simulation in aligning architecture with the goals of sustainable, smart cities.

Speaker: Yesaswini Chilukuri, Senior Engineer – Sustainability Design at Khatib & Alami Engineering Consultants.

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Upcoming Knowledge-Sharing Webinar - 2

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Theme: Healthcare Applications in Digital Learning
Date: 8 June 2025 (Sunday)
Duration: 45 mins + 15 mins Q&A
Time: 9AM ET / 3PM CEST / 6:30 PM IST / 10PM JST
Register Now

Presentation Title: Introduction to Healthcare Simulations & Case Scenarios

Speaker: May D Wang, Professor, FAIMBE,FIAMBE, FIEEE, ELATES Fellow, Wallace H. Coulter Distinguished Faculty Fellow, Kavli Fellow, GCC Distinguished Cancer Scholar, Georgia Tech & and Emory University.

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Upcoming Knowledge-Sharing Webinar - 3

Webinar 3: Building the Future of Learning – Simulation Ideas for Smart Classrooms
Theme: Advanced Learning in Educational or Classroom Environment
Date: 8 June 2025 (Sunday)
Duration: 45 mins + 15 mins Q&A
Time: 10:30AM ET / 4:30 PM CEST / 8PM IST / 11:30 PM JST
Register Now

Presentation Title: Building the Future of Learning: Simulation Ideas for Smart Classroom

Abstract: The presentation will explore the transformative potential of simulation-based education by highlighting key strategies and tools for enhancing learning outcomes in smart classrooms. Central to this vision is the integration of simulation-driven learning, which immerses students in experiential, hands-on scenarios that promote active engagement. Emphasis is placed on designing effective simulation scenarios that are contextually relevant, pedagogically sound, and aligned with learning objectives. Several innovative examples are presented, including the Virtual Mentor Quest, a narrative-driven AI mentor system; the Gamified Math Challenge Arena, which turns problem-solving into an engaging competition; and the AI-Powered Personal Tutor Avatar, offering personalized, adaptive instruction.

Speaker: Gustavo Giannattasio, IEEE FDC Board, IEEE TEMS Board, IEEE Smart Cities Board, AI Coalition, TCOES, IEC, N&A, Committees

Register

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📜 Frequently Asked Questions (FAQs)

❓ 1. Who can participate in the competition?

Answer: Participants must be either students at accredited universities or Young Professionals (YPs) who received their first professional degree within the past 15 years. Entrants must be at least 18 years old and reside in a country where participation is legally permitted.

❓ 2. How many members can a team have?

Answer: Teams can have **1 to 5 members**. Each person can participate in only one team. Teams must be finalized at the time of submission and cannot be modified afterward.

❓ 4. What are the three available theme categories?

Answer:

•Healthcare Applications in Digital Learning

•Sustainable Smart Cities and Urban Innovation

•Advanced Learning in Educational/Classroom Environments

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📜 Frequently Asked Questions (FAQs)

❓ 4. How do we register and officially submit a project?

Answer:

•Step 1: Express interest via the online form at

📎 https://metaversereality.ieee.org/competition

•Step 2: Submit your **Team Project Submission** (PowerPoint + Video) during the official submission period. Submission portal will be provided after the knowledge-sharing webinars.

❓ 5. What should our submission include?

Answer:

•A **PowerPoint presentation** (max 5 slides) describing the concept, theme, and educational impact.

•A **5–7 minute video** (.mp4) demonstrating the simulation and its core features.

📜 Frequently Asked Questions (FAQs)

❓ 6. What are the judging criteria?

Answer:

Projects will be evaluated based on:

- Simulation-based learning effectiveness (25%)
- Creativity & innovation (20%)
- Educational impact (20%)
- UI/UX & engagement (15%)
- Integration of AI/gamification (10%)
- Sustainability & accessibility (10%)

❓ 7. When is the submission deadline?

Answer:

📅 The final deadline for project submissions is **September 1, 2025, at 23:59 PM EDT**.

📜 Frequently Asked Questions (FAQs)

❓ 8. Can we submit an already published or past project?
Answer: No. Your project must be **original**, not previously published or submitted elsewhere. You must own full rights and comply with submission rules.

❓ 9. Can our project be a mobile or web-based simulation, or does it have to be VR/AR?
Answer: Yes, simulations can be developed in **2D or 3D environments** and may run on desktop, web, mobile, or immersive platforms (e.g., VR/AR). The key evaluation focus is on the **interactivity, innovation, and learning effectiveness**, not the platform.

❓ 10. Are we allowed to use pre-built assets or open-source libraries?
Answer: Yes, you may use publicly available assets and libraries as long as you **credit the sources properly**, and your final submission represents **original integration and educational innovation**.

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📜 Frequently Asked Questions (FAQs)

❓ 11. What is the expected level of technical complexity?
Answer: We encourage **creative and functional prototypes**. Submissions demonstrate an **educationally valuable simulation.**

❓ 12. Will our simulation be evaluated live, or only based on our submitted materials?
Answer: Evaluation is based entirely on the **PowerPoint and video submission**. Make sure your video **clearly showcases features, interactions, and value**, as the judges will not have access to live demos.

❓ 13. Do we need to submit code or technical documentation?
Answer: Your PowerPoint and video should be sufficient to explain the **concept, implementation, technologies used, and educational value**. Please incorporate **your source codes or developed platform links into the PowerPoint**.

📜 Frequently Asked Questions (FAQs)

❓ 14. Can a team submit more than one project if it fits different themes?
Answer: No. Each team can submit **only one entry**, and that entry must clearly specify which **theme category** it addresses.

❓ 15. What technologies or tools can we use to build our simulation?
Answer: You are free to choose tools based on your technical preferences. Some tools include:
•**Unity** or **Unreal Engine** for immersive 3D simulations
•**WebXR**, **A-Frame**, or **Three.js** for web-based applications
•AI integration via **TensorFlow**, **Dialogflow**
•AR/VR development with **ARKit**, **ARCore**

❓ 16. What happens if a team member drops out during the project development?
Answer: Team composition **cannot be changed after project submission**. If someone leaves before submission, you may reconfigure your team as long as it meets the 1–5 member limit. Final member list must be confirmed at the time of submission.

📜 Frequently Asked Questions (FAQs)

❓ 17. Are there any preferred programming languages or platforms for development?
Answer: No preference is given. You may use **any language, engine, or platform** (e.g., Unity with C#, Unreal with C++, WebXR with JavaScript) that best supports your simulation's educational goals. Judges evaluate the impact, not the tech stack.

❓ 18. Can the simulation be a collaborative, multi-user experience?
Answer: Yes. While not required, **collaborative or multiplayer simulations** are encouraged if they enhance learning, accessibility, or interactivity.

❓ 19. Is there a minimum duration or complexity for the simulation?
Answer: There is **no minimum complexity**, but the simulation must be **functional enough** to demonstrate its intended purpose and learning outcomes. The video should clearly show how a user interacts with and learns from the system.

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📜 Frequently Asked Questions (FAQs)

❓ 20. Can we submit a prototype that uses external services or APIs?
Answer: Yes, external services (e.g., OpenAI, Firebase, or Map APIs) are acceptable as long as your submission is original and does not violate any third-party licensing.

❓ 21. Will there be mentorship or support during the challenge?
Answer: Yes, registered participants will have access to a **Knowledge-Sharing Webinar Series**, where experts will present tools, best practices, and case studies. This is an excellent opportunity to ask questions and refine your simulation design.

❓ 22. Are there expectations for accessibility and inclusivity in our design?
Answer: Yes. One of the judging criteria includes **sustainability, accessibility, and ethical considerations (10%)**. Designing for users with diverse needs is highly encouraged and may positively influence your overall score.

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IEEE Metaverse | IEEE youngprofessionals | IEEE FUTURE DIRECTIONS

Calling all Students and Young Professionals:

2025 IEEE Metaverse Grand Challenge for Simulation-Based Learning

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Thank you for your attention