Web3D Ecosystem and the Metaverse

SIGGRAPH 2022 BOF

www.web3d.org

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Agenda

Web3D History and the Metaverse

Web3D Standards Ecosystem

Web3D Member Use Cases:
  Chris Lane: 3dMD/Human Avatars
  Casey Gomez: Versar/Geospatial
  Nicholas Polys: Virginia Tech/Design and planning
  Mike McCann: MBARI/Oceanographic research

Tuesday, July 26, 2022
History of the Metaverse
All operated within their walled gardens

Late 1990s
over a 28.8 modem

- blaxxun (now bitmanagement)
- Canal+
- VNet
- DeepMatrix v1
- Sony

Early 2000s

- Colony City
- Cybertown

Mid 2000s

- Bitmanagement
- Second Life
- There
- Google Lively

  - Avaya
  - Teleplace
  - VastPark
  - Olive

Mostly to play and socialize

None of these worlds could talk to each other… Nor could you take your avatar between them!
VirtuWorlds Giza - 1998 to Virginia Tech’s 3D Blacksburg - 2022

- GIS
- The Web
- Archival 3D
This time around, what should the definition of ‘Metaverse’ be?

Will the Metaverse be a constellation of connected microverses?

Will people be able to communicate without the constraints of physical space and time?

Could we do more than just play and socialize?
The Keys to an Open, Interoperable Metaverse

Web3D Position Paper

We believe that a fully successful ‘Metaverse’

• Will not be a collection of Metaverses separated by “walled gardens”

• We believe that a ‘unified metaverse’ will require the ability to move between micro-verses without dropping out of 3D mode.

• We see it as a constellation of connected multi-dimensional realistic and/or fantasy computer generated worlds.

• People will be able to communicate, collaborate, interact and travel, without the constraints of physical space and time.

Therefore, in our view, the ‘Metaverse’ will emerge as a property of the current primarily
Therefore, in our view, the ‘Metaverse’ will emerge as a property of the current primarily two-dimensional Worldwide Web (WWW).

With interconnection and interoperability between online, networked microcosmic ‘micro-verse’ created, as is the Web today, by individuals, corporations and institutions.

Interconnection between micro-verse will be provided by the Web itself.
What will the next Metaverse need?

Corporate Cooperation
Improved user experience
Improved Security
Interoperable standards
Web3D Consortium
Our Standards: X3D (VRML) and HAnim

- Not-for-profit Standards Development Organization (SDO), International, Member driven

- Developing **Royalty-free**, Open International Standards (ISO) **specifications** for Real-Time Interactive 3D Graphics for the Web

- Members dedicated to the portability, interoperability, and **durability** of interactive 3D content
What is X3D?

Extensible 3D (X3D) is platform-independent, file format and run-time architecture to represent and communicate 3D scenes and objects on the Web.

- Abstract Scenegraph
  - Describes the X3D content model including scene description and behaviors.
  - Extensibility mechanism for new node types and features.
- File Encodings
  - XML, Classic VRML, Binary, JSON, TTL
- Scenegraph API bindings
  - Javascript, Java, Python, C#, C++
X3D Features

X3D Anywhere!

3D + VR + AR Capable
Runs on multiple devices (Phones, tablets, desktops, caves)

Supports multiple data sets

Used in multiple domains (Medical, Geospatial, 3D printing/scanning, CAD and more)

Interaction, Animation, durability, Security

Build once use on any platform

www.web3d.org/x3d/why-use-x3d
Web3D Ecosystem

X3D Pipeline

X3D provides a presentation layer to display 3D models using multiple data sets from different domains.

Any WebGL supported Web browser

Load scene into the Web browser

Plug-in

Images, .x3d .wrl

In Line

X3D

.x3d .wrl

Bring data from any domain into X3D. Add scene description and behavior (interaction, animation using time, touch, space sensors. Use open-source (X3DOM, X_ite...). Publish on the Web or publish on standalone devices.

A complete 3D Web Application with Web services

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How does Web3D Fit into the Metaverse?

X3D ISO standard supports scene description and behaviors. Whereas other 3D standards e.g. glTF is a 3D model format.

3D Presentation layer, bringing data from multiple domains into one interactive 3D application.

Converging with other industry standards: HTML5, glTF, webGL, WebXR…
Metaverse - Web3D Standards Strengths/Opportunities

X3D is an ISO-IEC Standard open format and API working with the W3C Standard WWW Stack

Metaverse = www + Immersive 3D + Multimedia + Mixed reality

X3D XML provides authentication and encryption of 3D assets according to W3C Standard:

- LOD per viewer permission
- Treat avatar data like Health Data (HL7 FHIR)

X3D APIs provides programmatic access to the live scene
Web3D standards can be the data center to share and interoperate

- You decide how and what data to share and what software you want to use
- As a presentation layer we’ll put all your data sets together on the Web
- A seamless pathway to the Web
Extending our standards by engaging with other SDOs for data support and interoperability
Bringing data from multiple domains into one interactive 3D application.

Multimedia in the Metaverse
X3D for lighting and interaction
GLTF & X3D models
X3DOM + Javascript
Private / Proximity chat
YouTubeVideo
GitHub - SamyCoder/theArtMetaverse

Standards used: X3D, HTML5, glTF, webGL,
Several Open-Source Implementations

- X3DOM
- X_ite
- Castle Game Engine

Integrate 3D content seamlessly into your webpage - the scene is directly written into the HTML markup. No Plugins needed. Simply include a javascript file.

- Free WRL
- Xj3D

Octaga VS Bitmanagement
Web3D Evolution
1997-2022

Big tent, lots happening, the Extensible part of X3D has met many domain and application requirements.

X3D, the next generation VRML
Web3D Standardization Process
Volunteers and Members work together on Standards

Domain Specific Web3D Working Groups:
- X3D
- Medical
- Geospatial
- Mixed Reality
- Heritage
- Semantics
- Design Printing & Scanning
- Web3D UX

SDO Partnerships

www.web3d.org/working-groups

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X3D Use Cases

Geo Visualization

Virtual Worlds

Education

Mirror Worlds

Cultural Heritage

E-commerce

Gaming

Augmented Reality

Medical

Enterprise

www.web3d.org/case-studies
X3D Examples

https://www.web3d.org/example/large-streaming-oil-rig-model
What’s New?

- **X3D4: BIG NEWS!**

  - **X3D4** draft specifications for community comment and review. We are now under ISO-IEC ballot
  
  - Numerous improvements for HTML5 integration
    - GLTF and PBR support
    - WebAudio API support
    - Free online video tutorials and demos

  - Members continue to innovate X3D applications with real impact:
    - Case studies from Virginia Tech and Versar

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**QuickStart:**
https://webx3d.org/

X3D4:
- Load glTF; WebAudio

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Join us

Contact us: x3d-public@web3d.org

27th Web3D 2022 annual conference 2-4 Nov 2022
Evry (Paris), France (online and in-person) https://web3d.siggraph.org/

Web3D is a member of the Metaverse Standards Forum

Join the Web3D Consortium
https://www.web3d.org/join

Monthly Webinars: Learn X3D
https://www.web3d.org/webinars
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There are many benefits to joining Web3D Consortium as we build open interactive 3D standards for the Web.
Web3D Members Presenting Use Cases
Presentations are available [here](#)

Chris Lane
Domain: Medical/Avatars

Casey Gomez
Domain: Geospatial

Nicholas Ploys
Domain: Design and Planning

Mike McCann
Domain: Sc Viz
Thank you for joining us

www.web3d.org

Follow us @web3dconsortium

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Presentations available here

Videos available here

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