Web3D Ecosystem and the Metaverse

SIGGRAPH 2022 BOF

www.web3d.org

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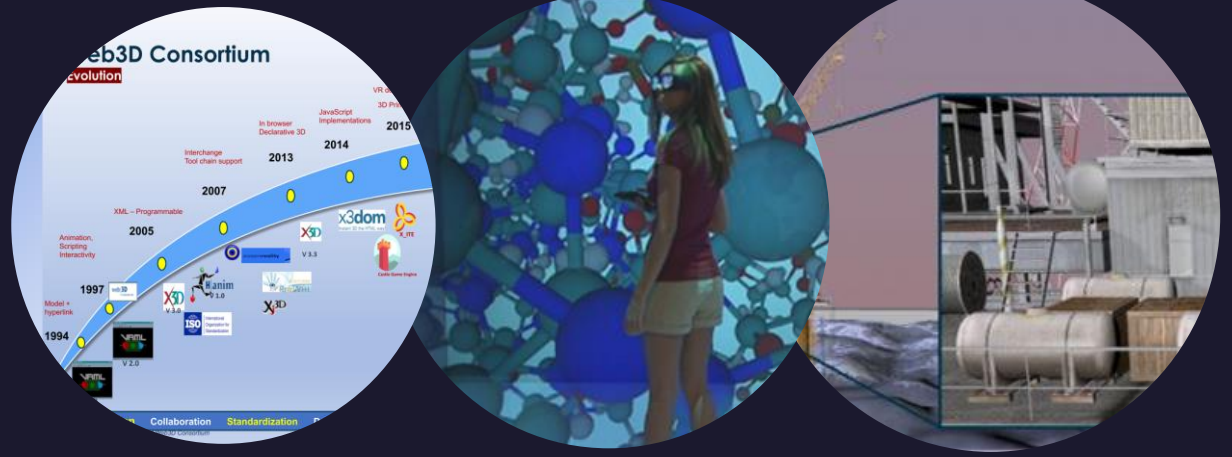
Agenda



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

History of the Metaverse

All operated within their walled gardens

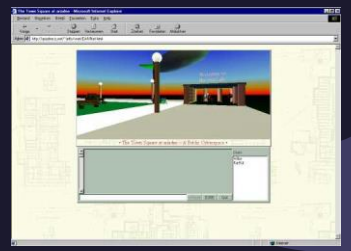
Mostly to play and socialize

None of these worlds could talk to each other… Nor could you take your avatar between them !

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

- **Federal Consortium of Virtual Worlds (2009-2013):**
- Avaya
- Teleplace
- VastPark
- Olive

RIP

VRML
VIRTUAL REALITY MODELING LANGUAGE

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-verses’ created, as is the Web today, by individuals, corporations and institutions.

Interconnection between micro-verses will be provided by the Web itself.

Therefore, in our view, the ‘**Metaverse’ will emerge as a property of the current primarily**

What will the next Metaverse need?

Corporate Cooperation

Improved user experience

Improved Security

Interoperable standards

Web3D Consortium

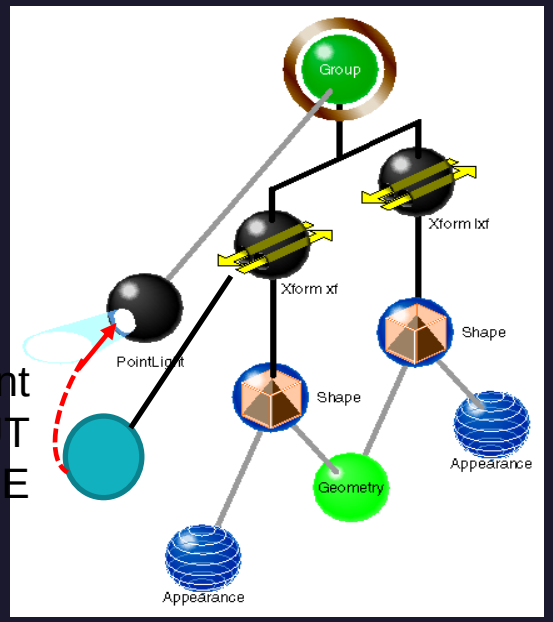
Our Standards: X3D (VRML) and HAnim

- 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
  Our Standards: X3D (VRML) and HAnim
- 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 provides a presentation layer to display 3D models using multiple data sets from different domains

X3D Pipeline

DOMAINS

- Geospatial
- Medical
- CAD/CAM
- 3D Scanning
- 3D Printing
- Design
- Manufacturing
- Heritage
- AR/VR

TOOLS

3DS MAX, SketchUp, Rhino3D, Meshlab, unity, blender, STEP, .OBJ

Images, glTF

In Line

.x3d .wrl

Load scene into the Web browser

Plug-in

Any WebGL supported Web browser

x3dom — Instant 3D the HTML way! — X_ITE

Castle Game Engine, instantreality, FreeWRL

Standalone Players...

A complete 3D Web Application with Web services

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

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

Metaverse - Web3D Standards Strengths/Opportunities

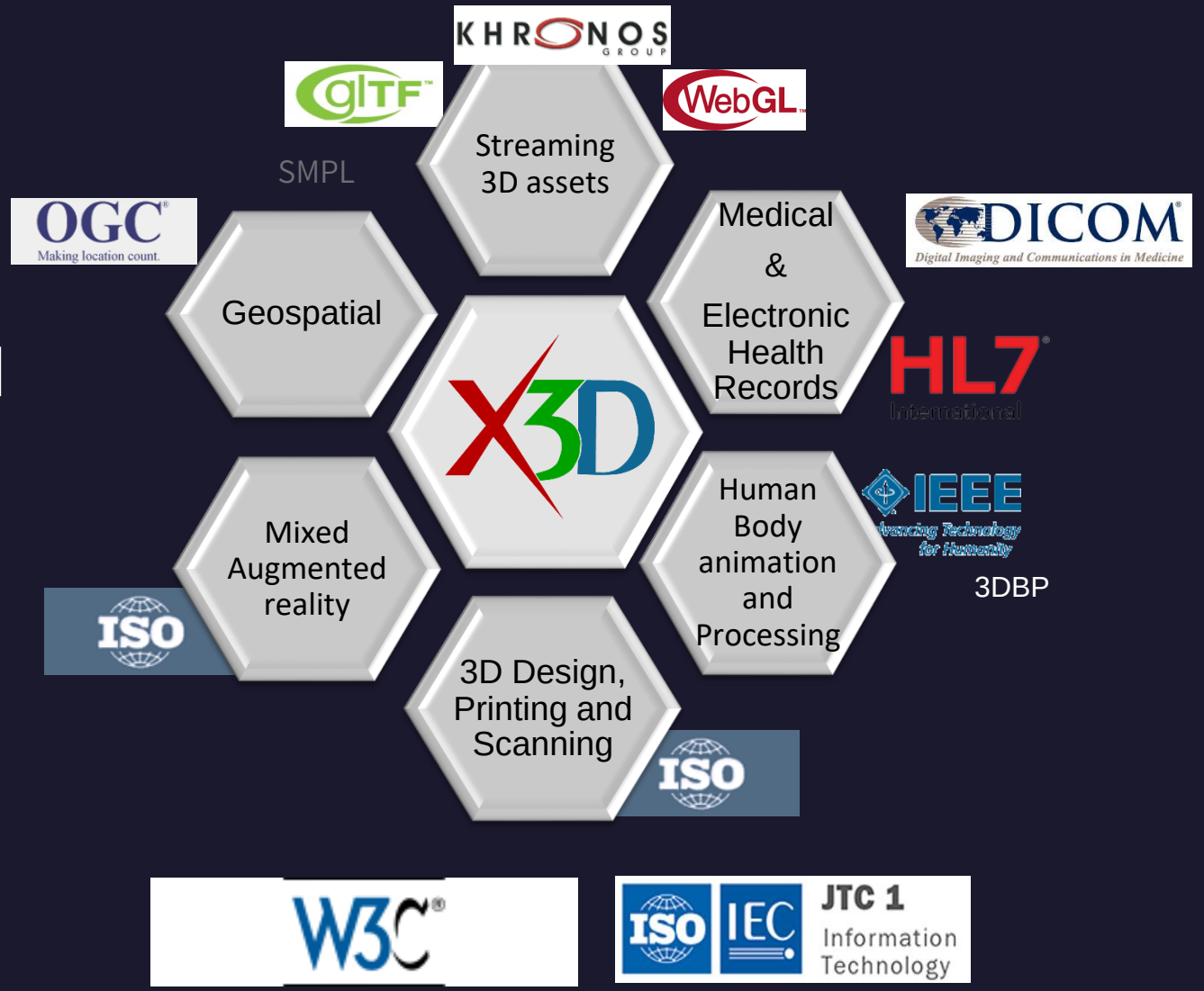
Web3D standards can be the data center to share and interoperate

- 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

...

Interoperability

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

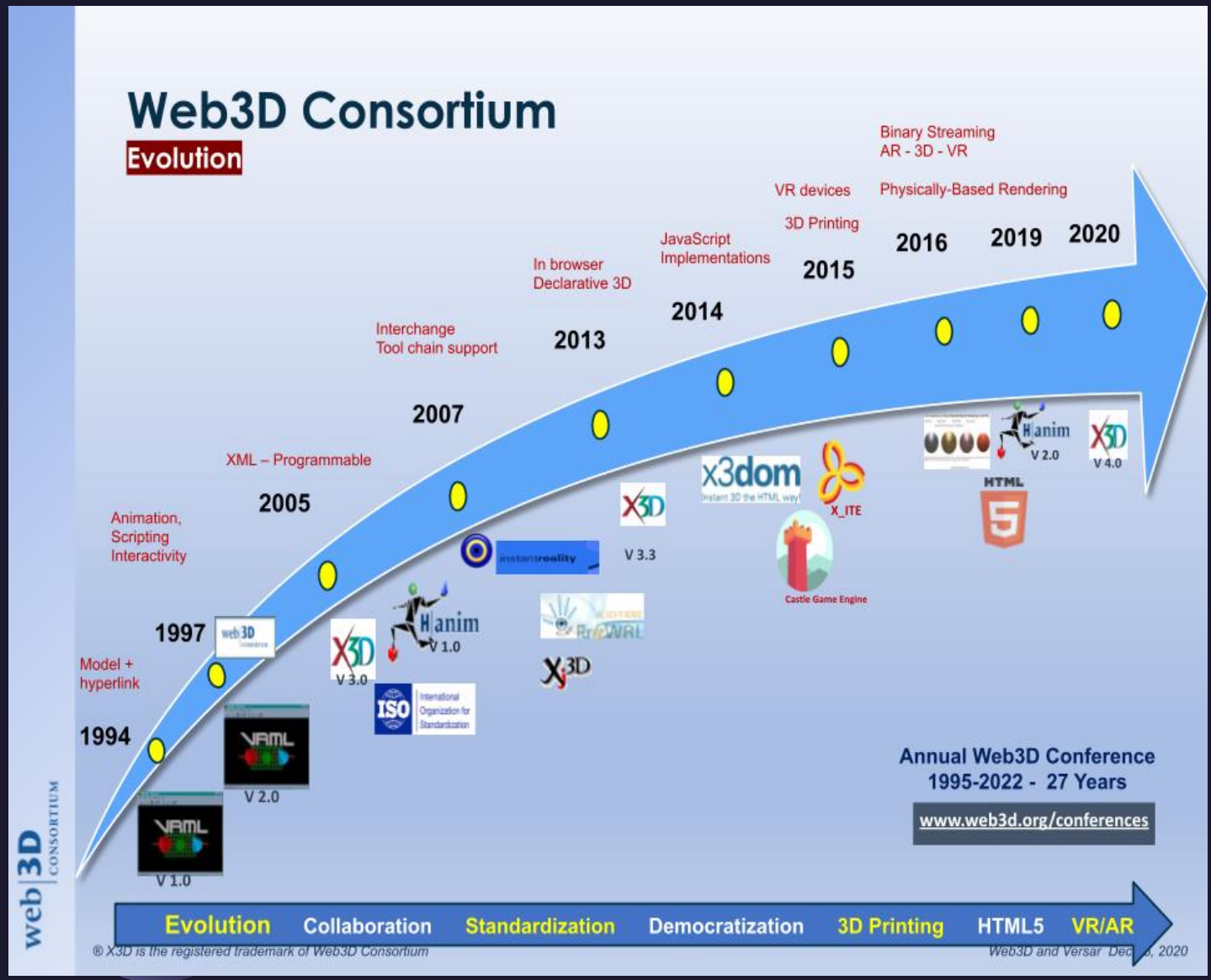
Octaga VS

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:

ISO IEC JTC 1 Information Technology **WG Sc 24**

X3D
Medical
Geospatial
Mixed Reality
Heritage
Semantics
Design Printing & Scanning
Web3D UX

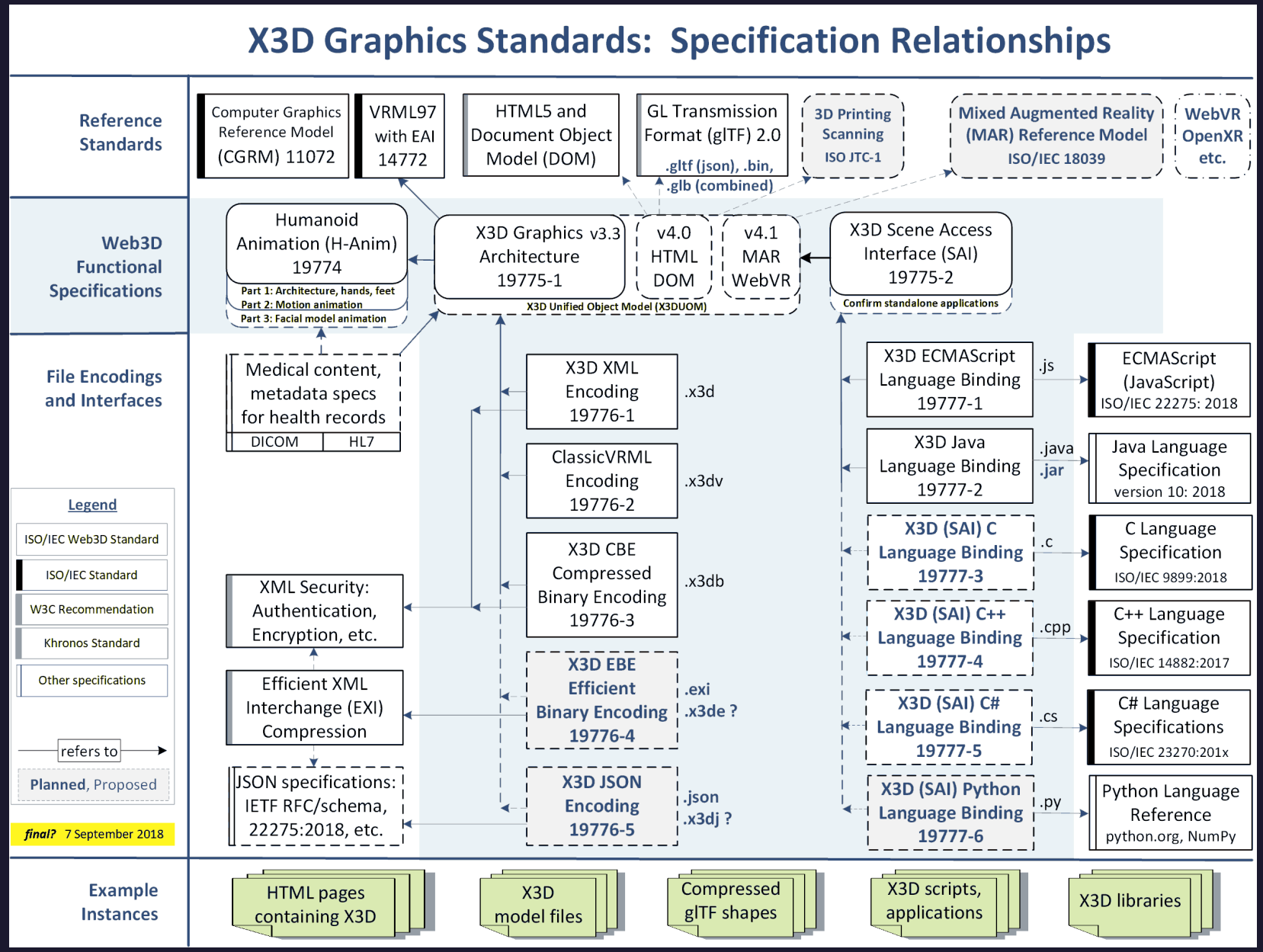
www.web3d.org/working-groups

SDO Partnerships

X3D

web 3D CONSORTIUM

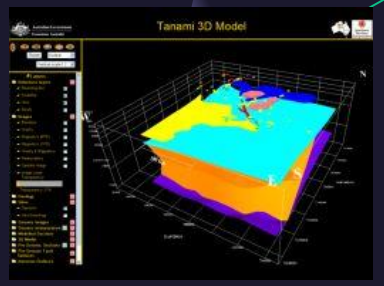
X3D Graphics Standards: Specification Relationships



X3D Use Cases

www.web3d.org/case-studies

Geo Visualization

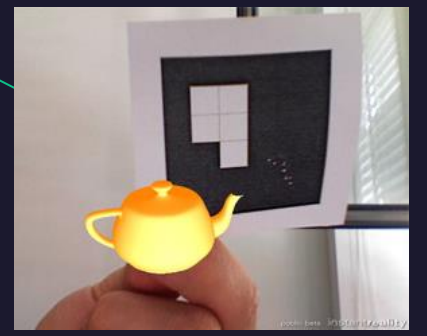


Education

Cultural Heritage

Gaming

Augmented Reality



Virtual Worlds

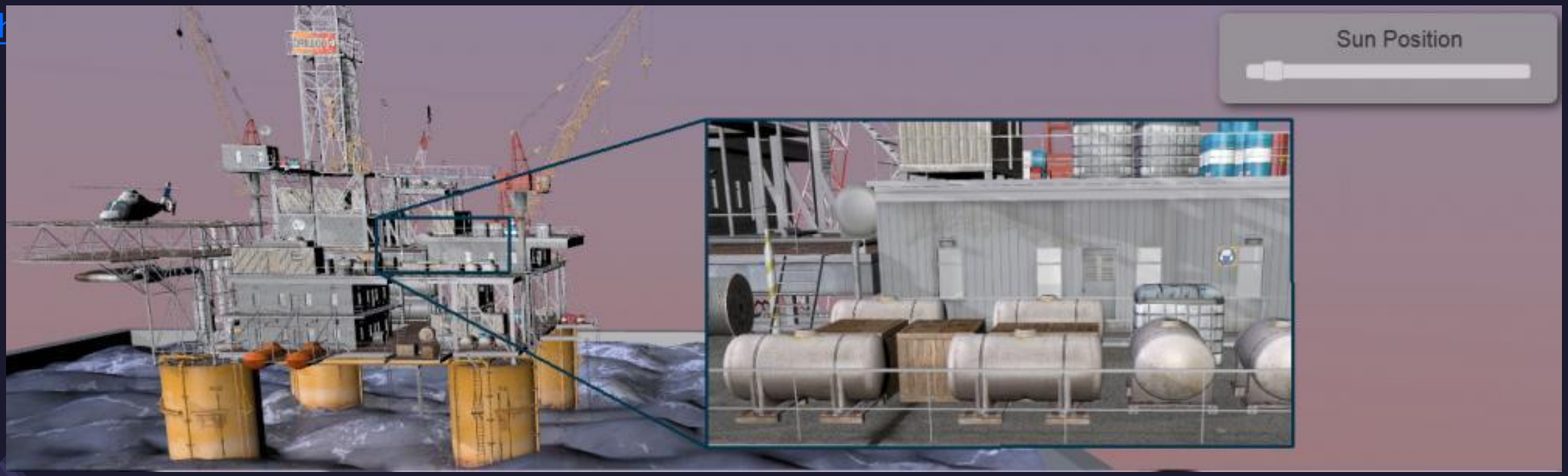
Mirror Worlds

E-commerce

Medical

Enterprise

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

- **X3D4:**
  Load glTF; WebAudio

QuickStart:
https://webx3d.org/

X3D Resources - Contact us: X3D-public@web3d.org

About:	www.webx3d.org/about
Membership:	www.web3d.org/join
Web3D Standards:	www.web3d.org/standards
Work Groups:	www.web3d.org/working-groups
Web3D Webinars:	www.web3d.org/webinars
Learn X3D:	www.webx3d.org/learn-x3d
Case Studies:	www.web3d.org/case-studies
Workshop:	www.web3d.org/Web3d-quickstart
Examples:	www.web3d.org/x3d/content/examples/Basic
News & Events:	www.web3d.org/news-events

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

www.web3d.org

X3d-public@web3d.org

www.web3d.org/member-benefits

Marketing Opportunities	Business Opportunities	Drive Web3D Standards	Networking Opportunities	Web3D Talent Bank
▪ Promote products ▪ Promote Services ▪ Speaking Opportunities ▪ Conference participation ▪ Booth partnership	▪ Business partnership ▪ Joint grants ▪ SDO Partnerships X3d-public@web3d.org	▪ Working Group participation ▪ Early access to standards ▪ Board Seat	▪ Industry Leaders ▪ 3D Research Experts ▪ 3D companies	▪ Access to Web3D experts ▪ Lesson Learned ▪ Proven Use cases

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

3dMD

Casey Gomez

Domain: Geospatial

VERSAR
Your Needs. Our Mission.

Nicholas Ploys

Domain: Design and Planning

Virginia Tech
Invent the Future

Mike McCann

Domain: Sc Viz

MBARI

Thank you for joining us

www.web3d.org

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Presentations available here

Videos available here

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