ISO/IEC JTC 1/SC 24/WG 6 Activities for Metaverse

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Disclaimer

This slideset describes ISO/IEC JTC 1/SC 24 Working Group (WG) 6 activities. It includes no promotional or proprietary information.

- **ISO/IEC JTC 1/SC 24**
- Computer graphics, image processing and environmental data representation
- https://www.iso.org/committee/45252.html
- **Working Group 6, Computer Graphics and Virtual Reality**

ISO/IEC JTC 1/SC 24/WG 6 Activities for Metaverse

a. WG6 is focused on interactive 3D graphics and human animation for VR/AR/MR on any device, holding a central and fundamental role in any future Metaverse activity.
b. WG6 reviews international specifications developed and contributed by partner Web3D Consortium for formal ISO/IEC JTC 1/SC 24 review, with sustained success for 25 years.
c. Web3D Consortium pursues broadest-possible public and industry requirements in collaboration with many SDOs including W3C, Khronos, and Metaverse Standards Forum (MSF).
d. WG6 standards to connect diverse information, using Web-based presentation and visualization of data-driven 3D models, can help all ISO/IEC standards relevant to future Metaverse.
e. To guide future design and achieve effective integration over Web, all ISO/IEC committees are welcome to share requirements, use cases, and examples with SC 24.

ISO/IEC JTC 1/SC 24/WG 6 activity

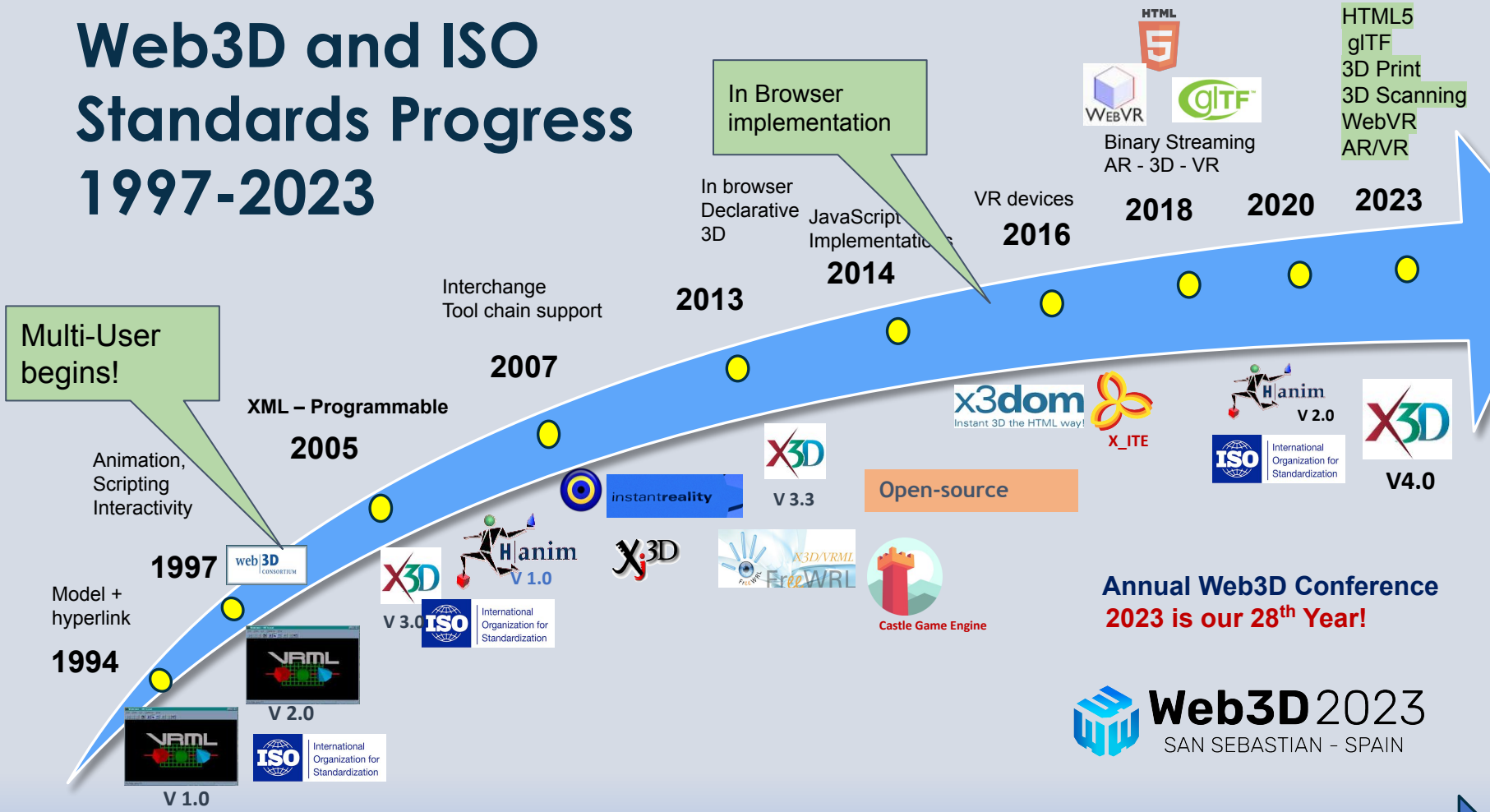
WG6 is responsible for development of standards relating to 3D Graphics, Virtual Reality, and related technologies.

Primary specifications of interest are Extensible 3D (X3D) series and Humanoid Animation (HAnim).

Web3D Consortium has a class A relationship with ISO/IEC for developing and implementing these standards.

WG6 then reviews specification documents for SC24 consideration and ISO/IEC member balloting. 25 years of successful continue to be quite fruitful.

Web3D and ISO Standards Progress 1997-2023



Annual Web3D Conference
2023 is our 28th Year!

Web3D 2023
SAN SEBASTIAN - SPAIN

Evolution Collaboration **Standardization** Democratization **3D Printing** HTML5 **AR/VR**

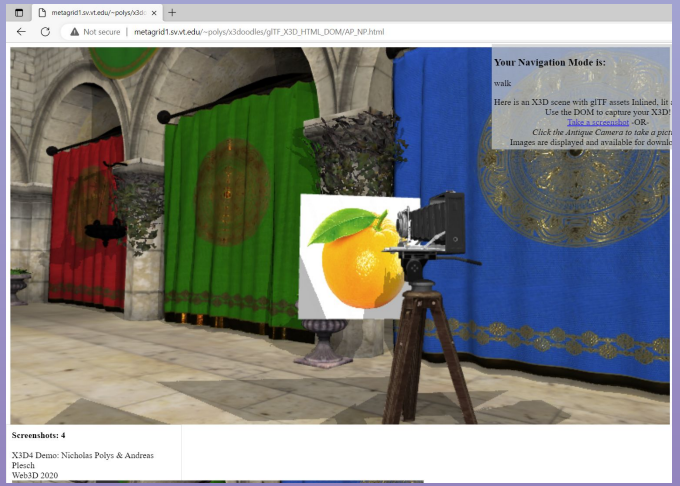
Extensible 3D (X3D) Scene Graph

- A data structure representing 3D scene for rendering and managing changes (transformation and behavior Graph)
- Designed for shared interactive experience in 3D worlds on any platform across multiple application domains
- Designed for flexible, royalty-free authoring and publication

X3D Provides Flexibility, Expressive Power

- **HTML**
  - 2D User Interfaces, layouts
  - DOM and event linkages
- **X3D**
  - compose 3D scenes across formats and languages
  - user interaction, any device
- **glTF**
  - model embed, convert
  - advanced rendering

- **Audio**
  - spatialization
  - Web Audio API
  - MIDI 2.0



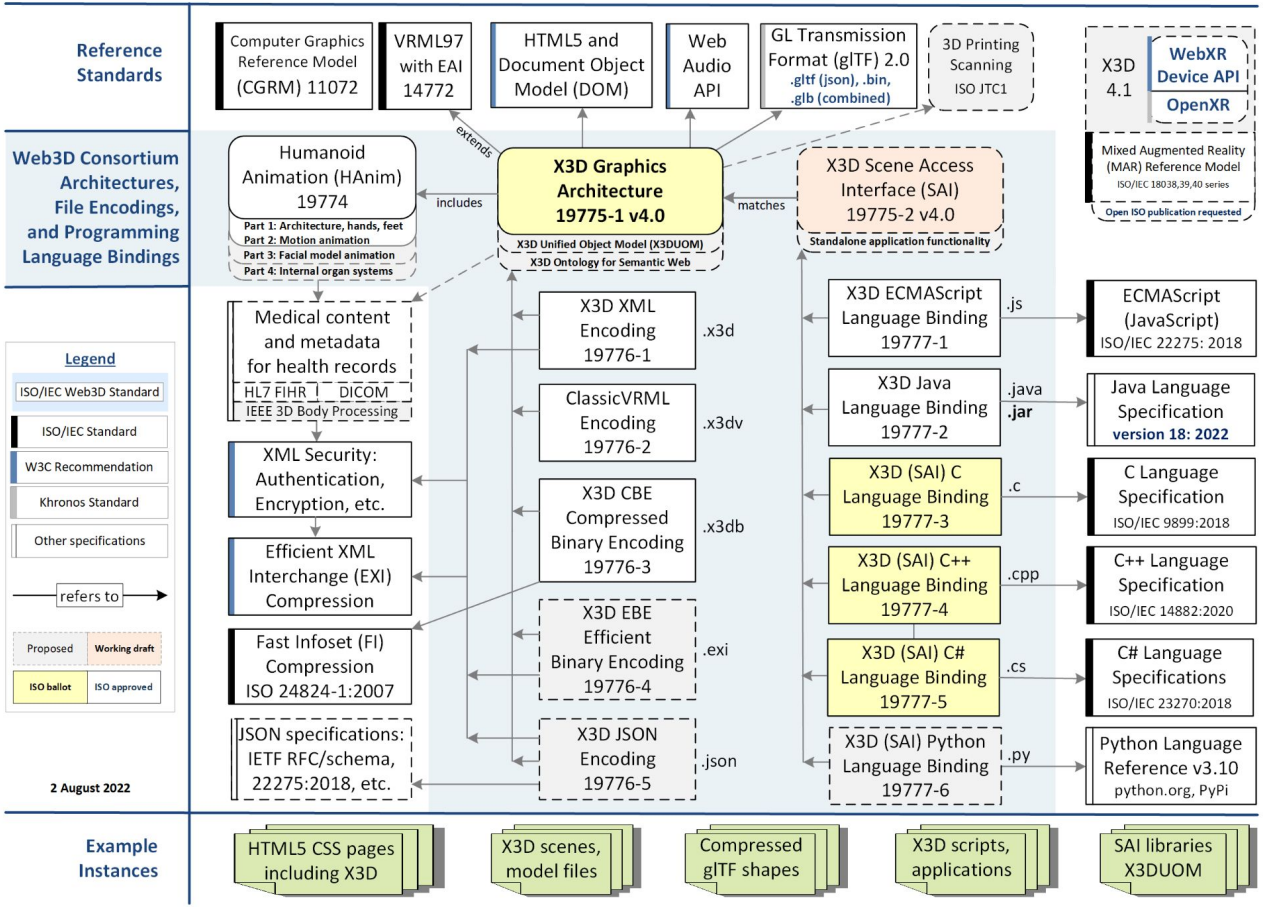
Single Architecture

Multiple
File Encodings

Multiple Programming
Languages

X3D supports HAnim

X3D Graphics Standards Relationships



Web3D Consortium

Web3D.org

International, non-profit, member funded,
Standards Development Organization (SDO) since 1997.

Developing the royalty-free ISO/IEC specifications
X3D and HAnim for interactive 3D Graphics on the Web

Community of Technologists and Enterprises who value open, stable 3D platforms since VRML97

Members include Academia, Government, Industry, Research, and Professionals

Class A liaison relationship with ISO/IEC for 25 years with partnered publication of standards using HTML

Web3D Efforts include SDO Harmonization

Engagement and coordination performed by working groups with multiple SDO open standards and open source efforts.

Elements of a Virtual Environment

- Real-time scene clients with lighting, animation, objects, user interaction (load asset and I/O devices)
- Scene updates thru user interactions (animation events, Web links)
- Shared consistent state via Web

Metaverse has many definitions

A virtual-reality space in which users can interact with a computer-generated environment and other users.

What might be a workable definition of term ‘Metaverse’? Here is one of many:

- A constellation of connected multi-dimensional computer generated **virtual worlds**
- Where people will work, learn, play, buy, sell, communicate, collaborate, interact and travel.
- Could it be a sustainable, open and interoperable
- Could this be achieved through existing standards

Paper: The Keys to an Open, Interoperable Metaverse

Metaverse STANDARDS FORUM™

Metaverse Standards Forum (MSF) has many current efforts, over 2300 members

3D Web Interoperability Proposal

Metaverse Standards Forum

Goal

Enable the broadest possible interoperability of Metaverse content using the Web

To make the Metaverse fully interoperable with the WWW and the Standards ecosystem in order to enable new Metaverse capabilities to flourish on a strong foundation..

X3D, HAnim Upcoming Events

SIGGRAPH 2023 6-10 August 2023 - **Los Angeles, California**

Multiple sessions: 3D Interoperability, X3D, Cartographic BOFs

Web3D 2023 9-11 October 2023 - **San Sebastian, Spain**

Metaverse Theme, Papers, Tutorials, Workshops

Recommendations

SC24 working groups have significant overlaps with multiple Metaverse Standards Forum (MSF) initiatives.

Web3D Consortium continued engagement MSF goals and requirements helps inform multiple ISO standards.

X3D and HAnim usefulness for Web publication provides a good fit with MSF 3D Web Interoperability, ISO Smart Cities, etc. etc. etc.

Conference

WEB3D

Web3D: 3D technologies for the World Wide Web

WEB3D • *3D technologies for the World Wide Web*

The annual ACM Web3D Conference is a major event which unites researchers, developers, entrepreneurs, experimenters, artists and content creators in a dynamic learning environment. Attendees share and explore methods of using, enhancing and creating new 3D Web and Multimedia technologies such as X3D, VRML, Collada, MPEG family, U3D, Java3D and other technologies. The conference also focuses on recent trends in interactive 3D graphics, ... (More)

SIG Sponsors:

SIGGRAPH

ACM Digital Library: Web3D
https://dl.acm.org/conference/web3d

Bibliometrics

Publication Years	Publication count	Available for Download	Citation count	Downloads (cumulative)	Downloads (6 weeks)	Downloads (12 months)	Average Citation per Article	Average Downloads per Article
1995 - 2022	663	630	5,591	270,354	1,669	16,481	8	429

Presentation Contributors

Dr. Richard F. Puk (JTC 1/SC 24/WG 6 Convenor) puk@igraphics.com

- Dr. Richard F. Puk has been participating in the development of 3D computer graphics standards since the initial founding meeting for the ACM SIGGRAPH Graphics Standards Planning Committee. He is a founding member of Accredited Standards Committee X3H3 and its task group developing PHIGS and has served as chairman of this task group. Dr. Puk is also a member of the U. S. delegation to international computer graphics standards meetings. He has been the document editor for various ISO standards including the ISO PHIGS/Ada Binding various ISO PHIGS amendments. Presently, he is co-editor of ISO VRML, ISO/IEC X3D, ISO/IEC SEDRIS as well as related technologies. Dr. Puk has worked in education, government, and industrial positions in the United States and as President of Intelligraphics Incorporated, a firm specializing in the design of computer graphics systems architectures. He is recently retired. He holds a Bachelor of Science from the University of Arizona and both a Master of Science and the Doctor of Philosophy from Purdue University.

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- Dr. Brutzman serves at the Naval Postgraduate School (NPS) in Monterey California. He is cochair for the Extensible 3D (X3D) Graphics Working Group for the non-profit Web3D Consortium. He is active as Web3D liaison to World Wide Web Consortium (W3C), U.S. National Standards Body INCITS Committee H3, and MSF Metaverse Standards Registry (MSR). His research interests include underwater robotics, real-time 3D graphics, artificial intelligence (AI) and networking.