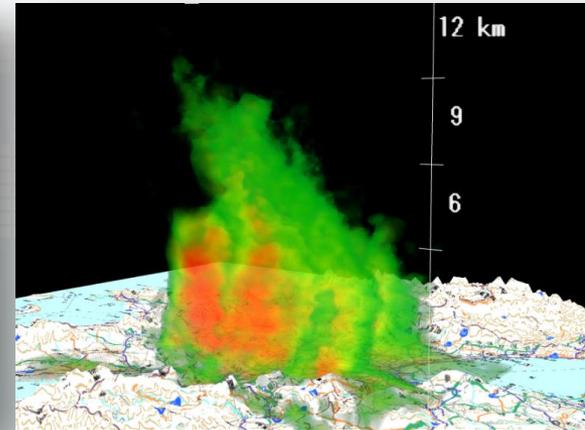




X3D: An Open 3D Digital World



Web3D and X3D Overview

Web3D Consortium – Anita Havele, Executive Director

Anita.havele@web3d.org

March 2015

Market Needs

Highly integrated interactive 3D worlds

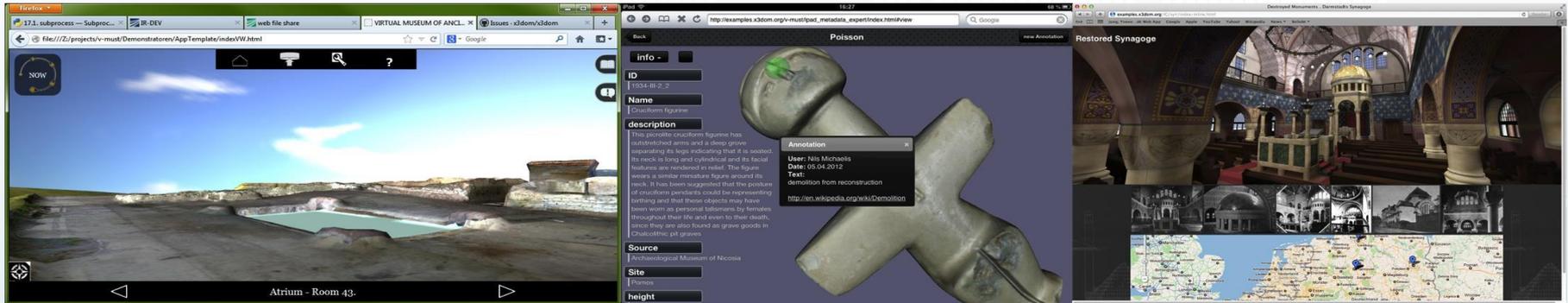
Cities - Weather - building - Engineering - scientific

Web as the delivery method



Next-Generation 3D Web Applications

Immersive 3D inside your Web browser



Enhancing user experience with sophisticated visualizations

Yesterday: website with videos

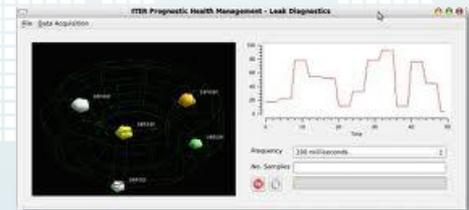
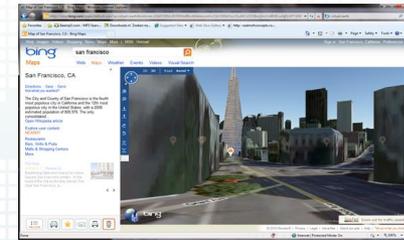
Today: Immersive 3D inside your Web Browser

Diverse Data Sources

Increased Interest in 3D Web applications

- Geospatial data

- Terrain
- Imagery
- Buildings
- Simulation/design

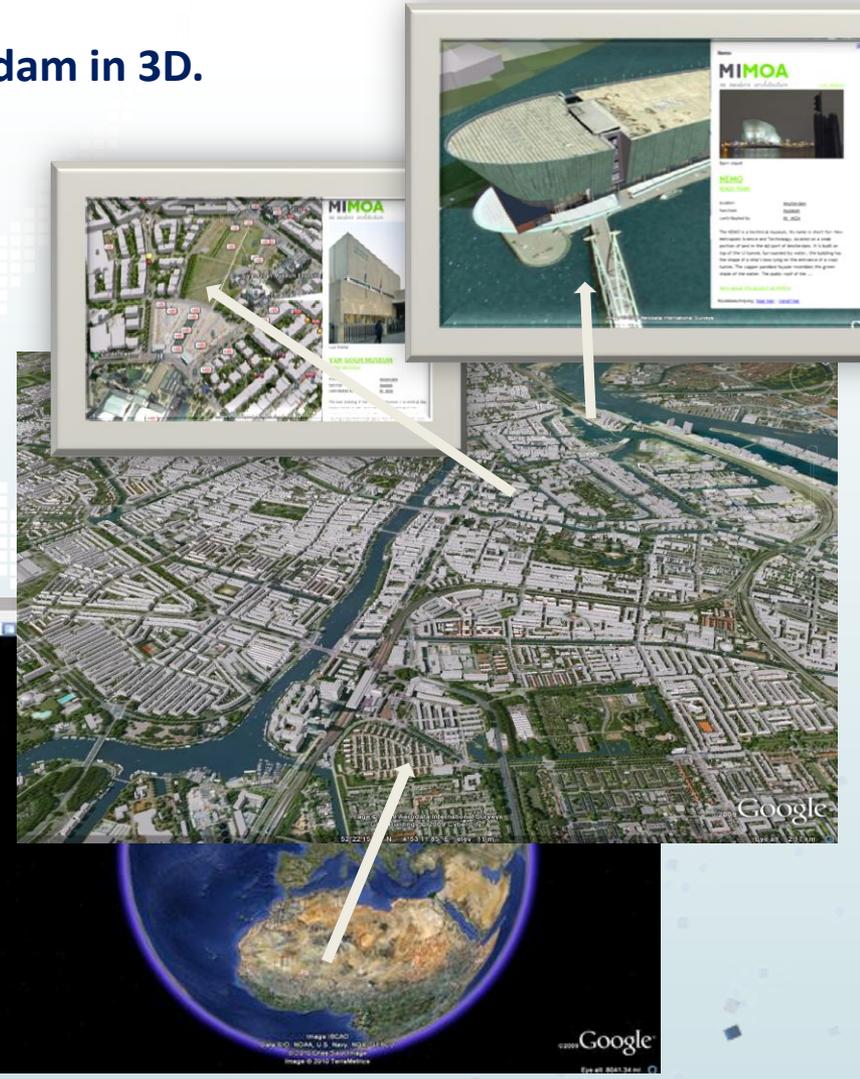
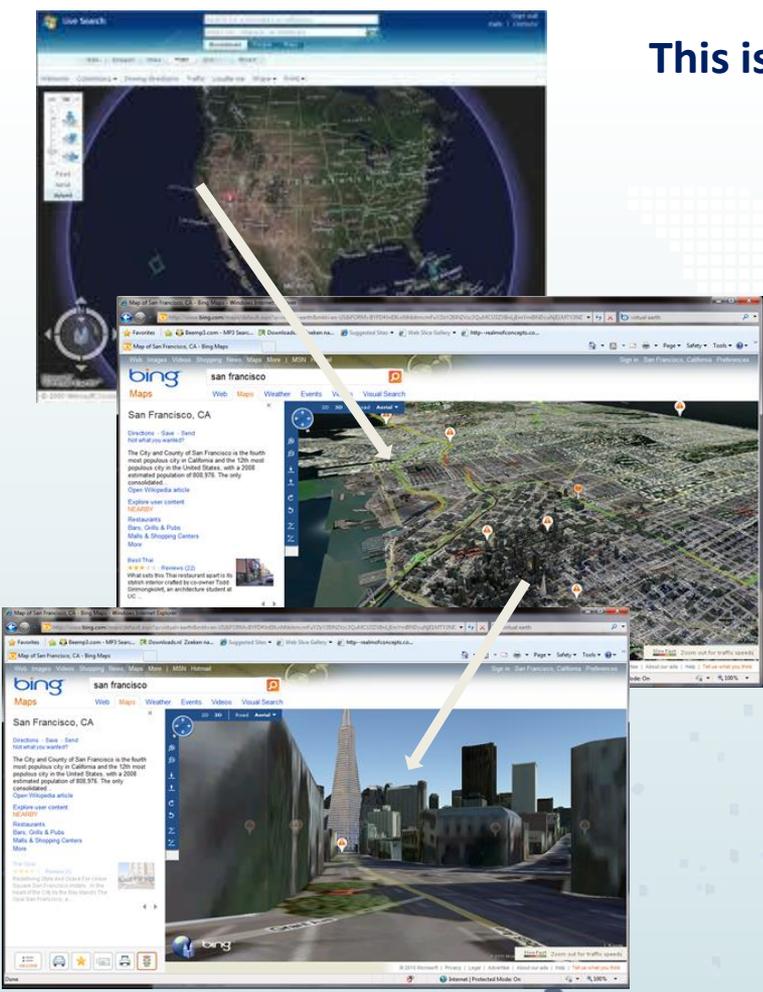


- Visualization of abstract information
- Experiencing Cultural Heritage data in 3D
- Virtual Engineering



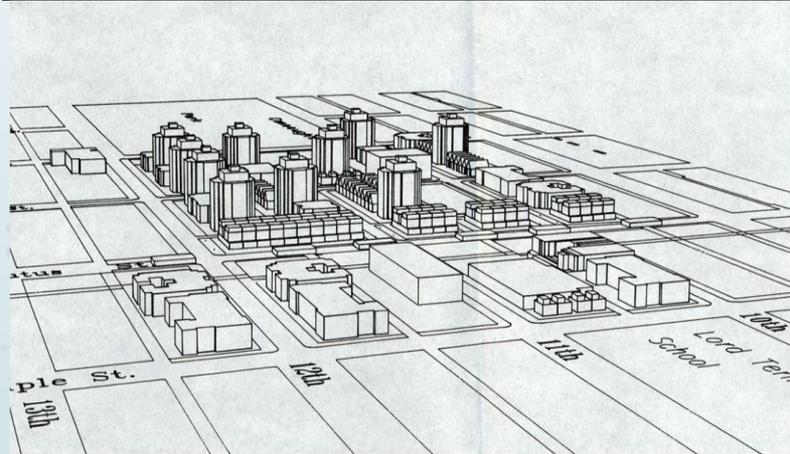
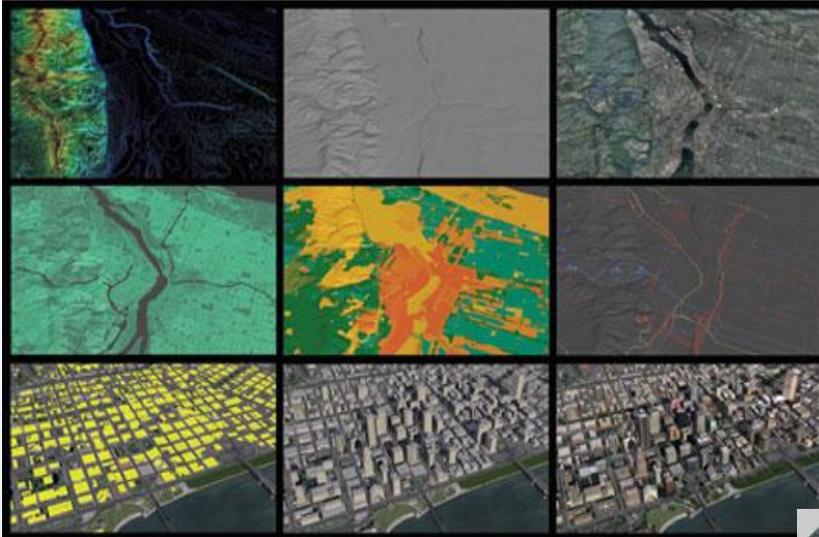
3D Cities on Digital Globes

This is Amsterdam in 3D.



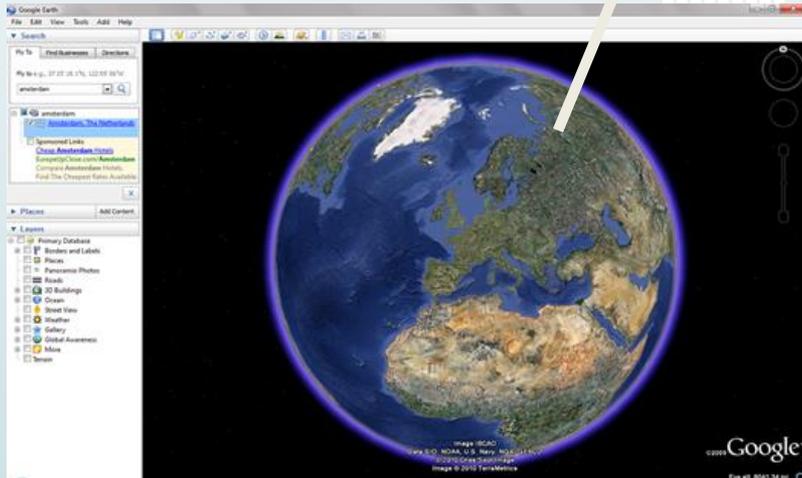
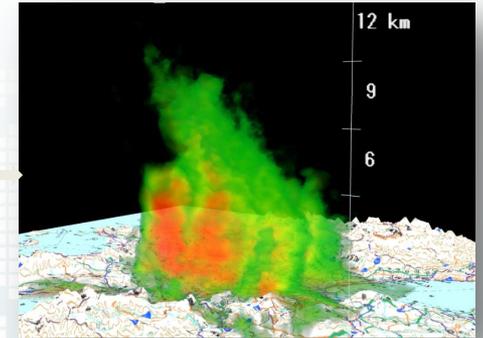
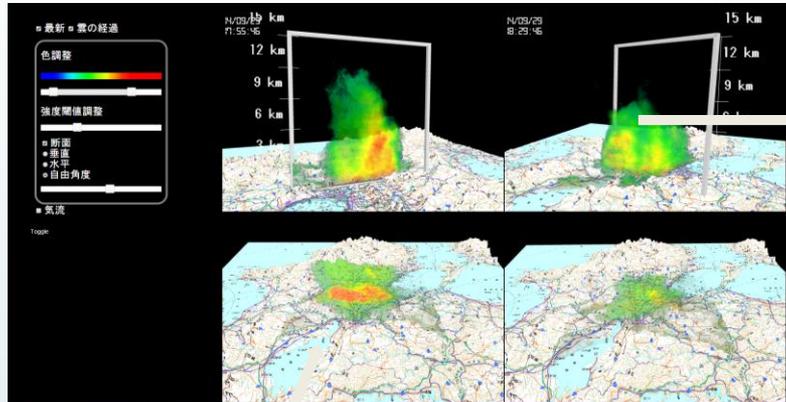


3D Smart Cities



City functions and informed planning decisions

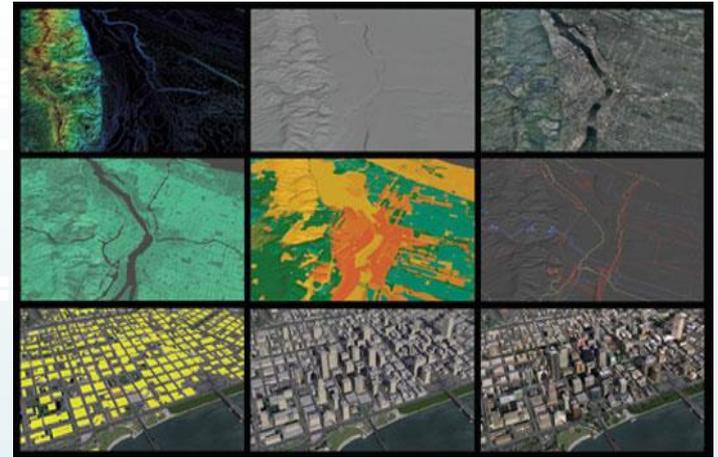
Volumetric 3D weather data on Digital Globes



3D Maps with volumetric cloud data.

Agriculture & Development

- Crop suitability
- Land use
- Water
- Weather / climate
- Terrain
- Local scans
- ...





What's the future for your technology?

Market Dominance: Biggest competitor wins?

- Companies hope to “own” 3D
- Success is short lived, many companies die
- Poor open standards support
- Single vendor solutions & lock-in (closed or patented technologies)

Leading to NO portability, interoperability, extensibility and durability



What does all this mean?

Our Mission

- **International Collaboration**
- **Convergence of standards & policies**
- **Market adoption**





Standards are proven and evolving

web | 3D ^{X3D}
CONSORTIUM



OGC[®]
Open Geospatial Consortium, Inc.

CityGML

W3C[®] WORLD WIDE WEB
consortium

HTML5

KHRONOS
GROUP

WebGL

Market Adoption Web Browser Support



WebGL



Why Are Open Standards Important for 3D?

Creating quality 3D content is expensive:

Both in time and software costs



Something just as expensive is recreating 3D content:

When the underlying technology no longer works

Proprietary 3D technologies:

Rarely interoperable



Data must Coexist



CAD



BIM



CAM



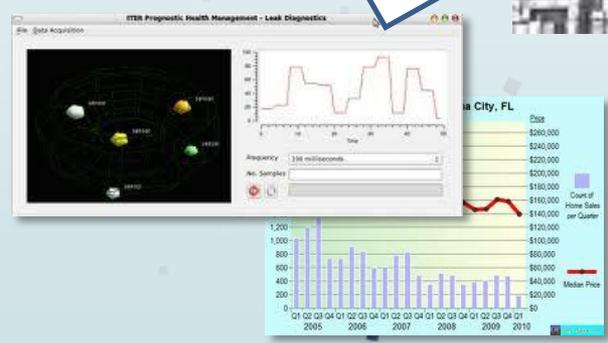
Design



Laser Scan

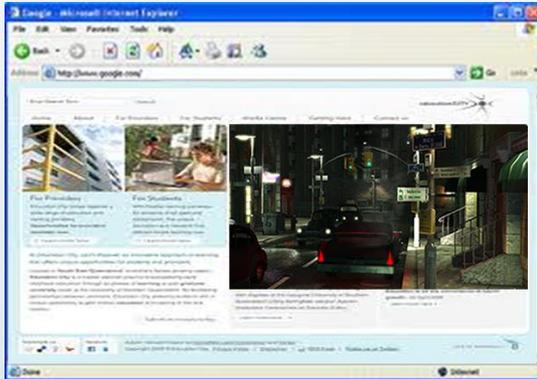


Open Standards
Supported Framework





Web3D Consortium is making this happen with X3D technology



Ensure an open digital framework to help designers, engineers and industries deliver interactive 3D on the Web.



X3D - Interactive Real-time 3D standard for the Web

Open ISO Standard
Royalty-Free
Evolutionary - 1997
Durable
Interoperable
Multi Platform

The screenshot shows the web3D Consortium website. At the top left is the logo 'web3D CONSORTIUM' with the tagline 'Open Standards for Real-Time 3D Communication'. To the right is a Google Custom Search bar and social media icons for YouTube, LinkedIn, Twitter, and Facebook. Below the header is a navigation menu with links for HOME, NEWS & EVENTS, ABOUT WEB3D, JOIN, WIKI, SPECIFICATIONS, and MEMBER LOGIN. The main content area features a 3D street view of San Francisco, Washington St, with a yellow arrow pointing down the road. Below the 3D view are buttons for 'Street View', 'Left View', 'Right View', 'Birds-eye', and 'Area View'. At the bottom of the page are four promotional boxes: 'Case Studies' (Great Projects by Our Members), 'X3D & VRML' (The Most Widely Used Formats), '3D in HTML' (X3DOM... 3D Without Plugins), and 'Web3D Videos' (X3D and VRML). The footer contains copyright information: '© 1999-2011, Web3D Consortium' and a description of the organization as a nonprofit that develops and maintains the X3D, VRML, and H-Anim standards.



Who is developing X3D?

Web3D Consortium founded in 1997

- International
- Non-profit
- Member-funded
- Industry group

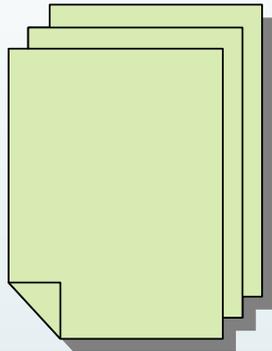


www.web3d.org

Our members: Business, Academia, Government and Professionals

What is X3D?

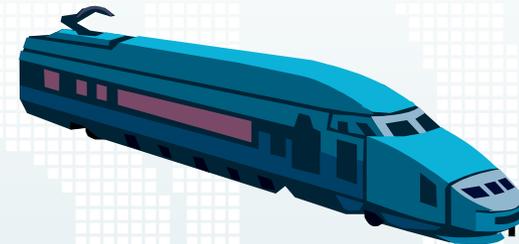
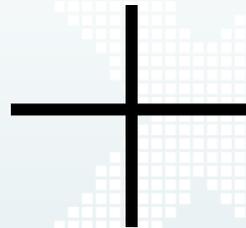
X(Extensible)3D- A complete solution for 3D on the Web



File Formats:

XML, ClassicVRML, Binary

**Meshes • Lights • Materials •
Textures • Shaders
Interaction • Animation •
Audio/Video**



Event Model

**open source and commercial
engines**

**Real-Time • Web-based •
Interactive • Animation •
Extensible • Scriptable**

Scene graph for real-time interactive 3D

Delivery of virtual environments over the web

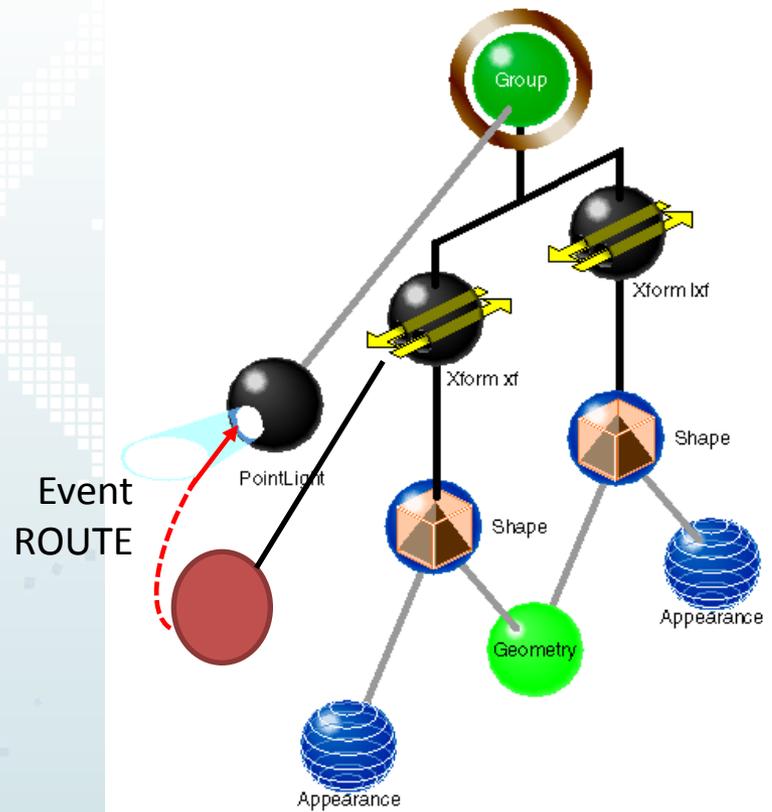
The next-generation VRML

Multiple ISO-ratified encodings

- XML (.x3d)
- Classic VRML (.x3dv)
- Compressed Binary (.x3db)
- JSON

Multiple APIs

- ECMAScript (JavaScript)
- Java
- Python



X3D Components and Profiles

Goal:

- Modular 3D visualization components
- Reduced complexity and implementation effort

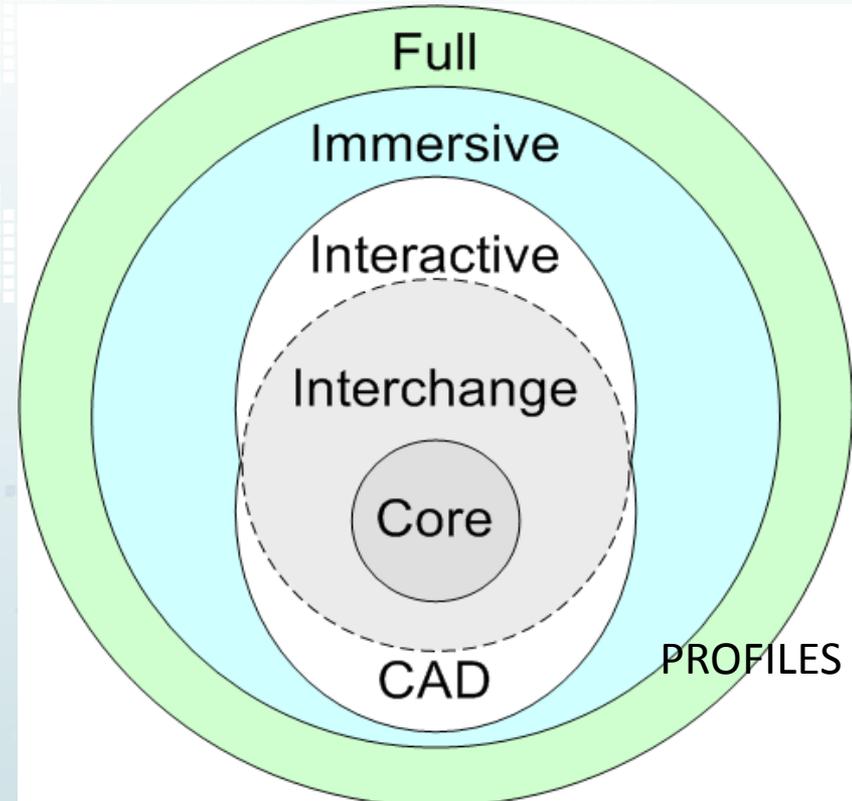
Components: Geo, CAD, Medical...

A light-weight X3D

- light-weight runtime essentials
- A stripped-down X3D Scene Graph
- Complimentary to other platforms and data services
(HTML5, Mobile, OGC, W3C, DICOM, ...)

Uses

- Mobile applications
- Vertical Markets (Geo, Medical)
- Augmented Reality Applications
- Virtual Reality





Geospatial Component of X3D

Geospatial scenes have requirements beyond ordinary 3D scenes

- **Double-precision accuracy** on floating-point displays
- Diverse yet **coherent spatial reference** systems

11 X3D Geospatial nodes add Geo functionality to X3D

- Integrates the globe with X3D scenes



Generation of local regions or full-scale globes using any data

Spatial data creation

Spatial representation/analysis and

Spatial 3D Presentations

Real-time sharing and Interactive/Immersive 3D visualization

Without license restrictions, openly scalable

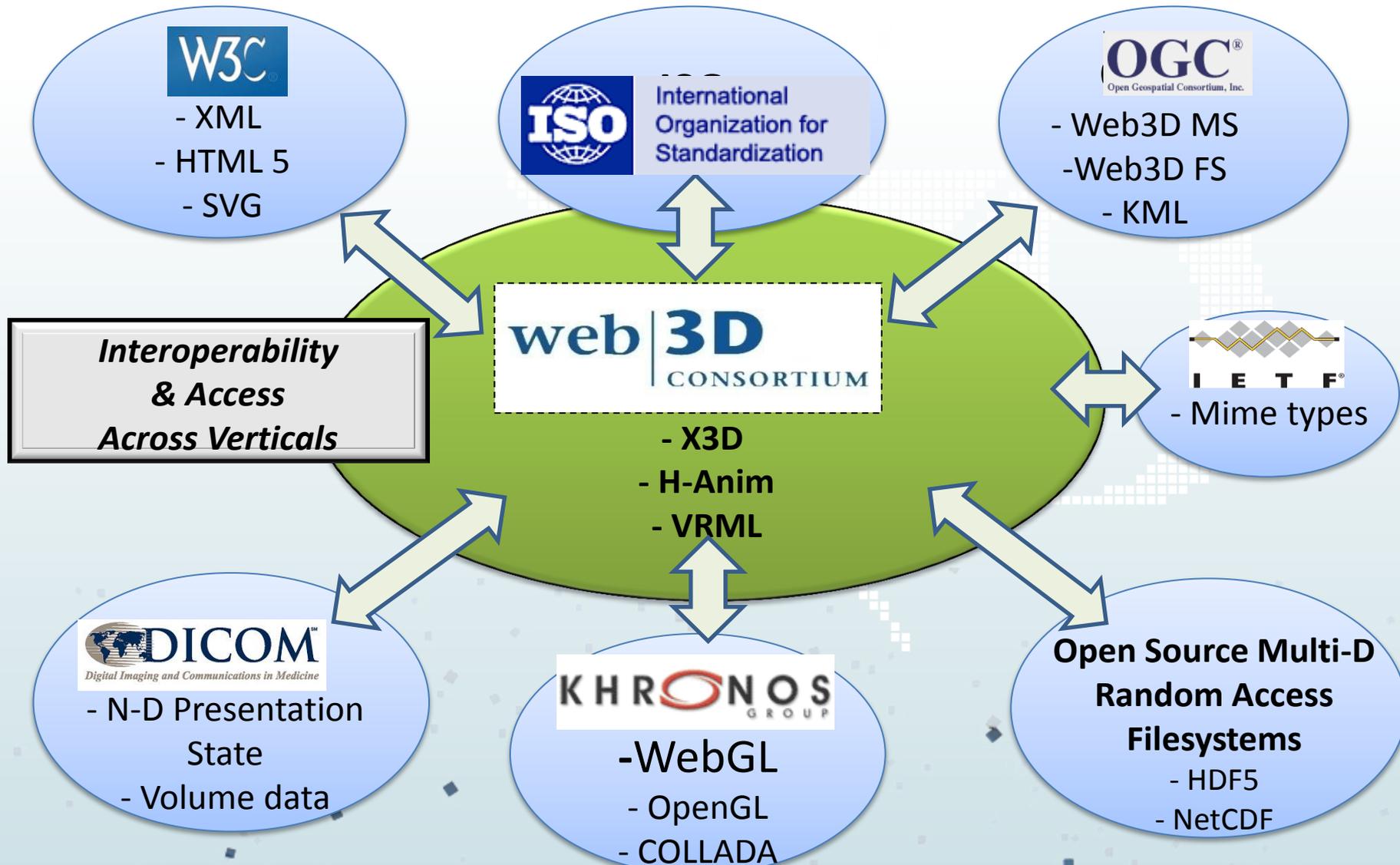
X3D Standardization Process

The X3D specifications are online at:
<http://www.web3d.org/x3d/specifications>





Web3D Collaboration & Convergence





X3D Resources

- **Open Source Players**

 - Xj3D – stand-alone player

 - FreeWRL – (Mac, PC, Linux), stand-alone and plug-in

- **Open Source Authoring Tools**

 - X3D-Edit

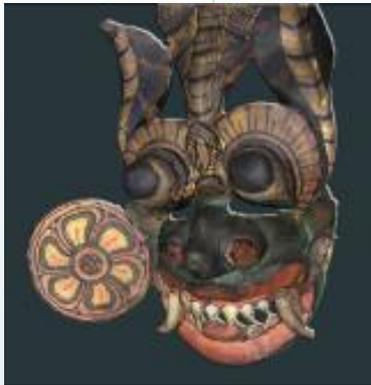
Open Source Models and Converters

 - [X3D Resources](#)

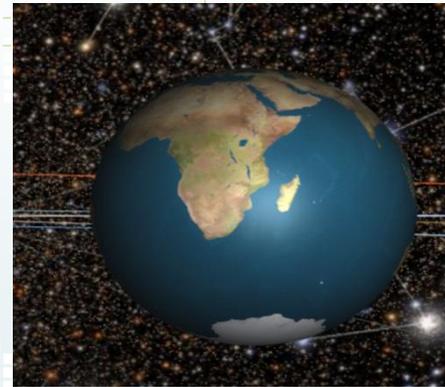
- [X3D Book/Course Videos](#)

X3D: Foundation for All Markets

Cultural Heritage



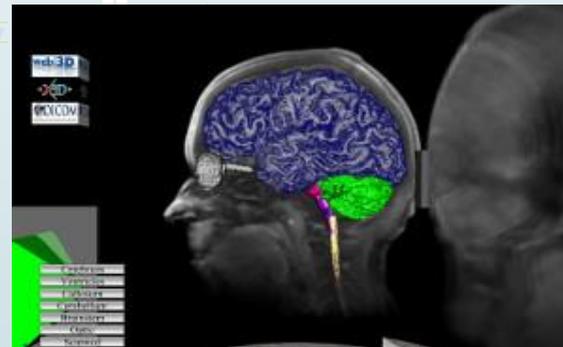
Geospatial



Augmented Reality



Medical





X3D: Create once - Run Anywhere



All browsers
All platforms

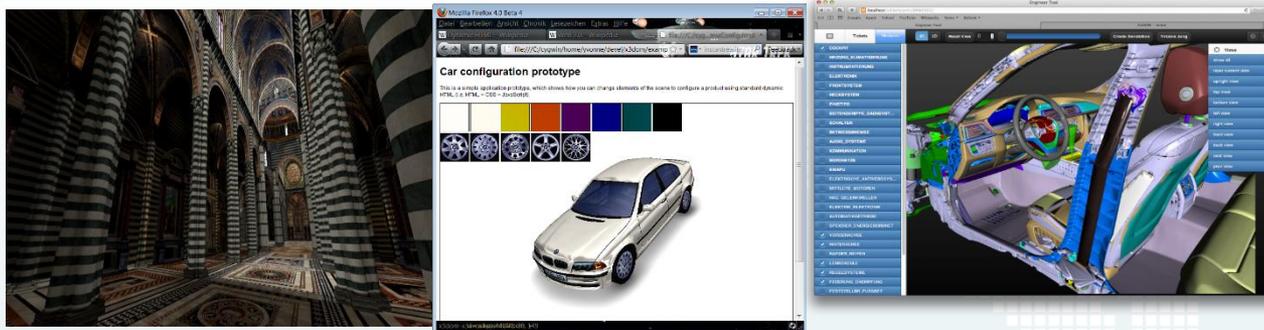
X3D Models built
15 years ago run
even faster on
today's platforms



The Web is your platform

Why use X3D?

Open, Durable, Portable and extendable



- Open source, free, and royalty-free ISO standard
- Provides an Interactive and immersive 3D experience
- Runs on many platforms from mobile to caves
- Efficient compressed binary encodings for high performance
- Compatible with other Standards
- **Archival stability that stand the test of time**

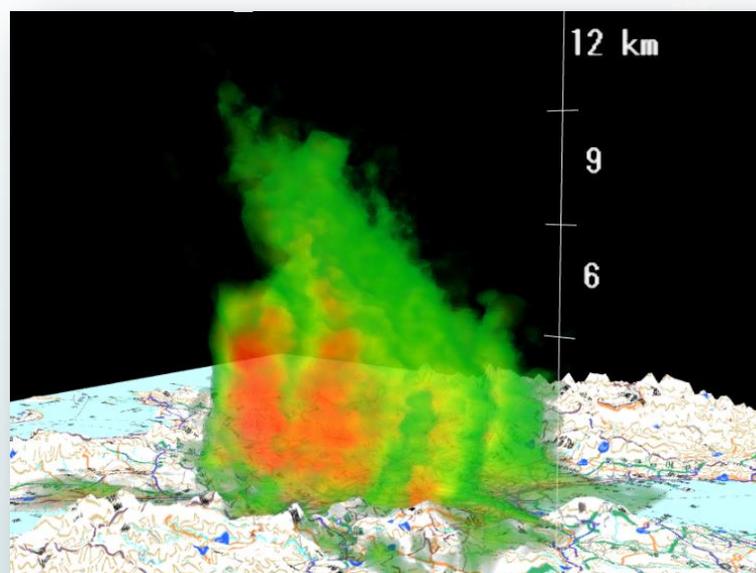


The National Institutes of Health joins Web3D Consortium



X3D standards for model archive and 3D printing

The Toshiba joins Web3D Consortium



X3D standards for Volumetric Data



Upcoming Web3D Events



2015 Web3D Conference – June 18-21, 2015

20th Anniversary

Heraklion, Crete, Greece

VR Hackathon - San Francisco, California

May 2015

SIGGRAPH 2015 - Los Angeles, California

Aug 2015



An Open 3D Digital World



Join us to Build the Future of 3D

Visit us at: www.web3d.org

To Join: www.web3d.org/join

Email: anita.Havele@web3d.org

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