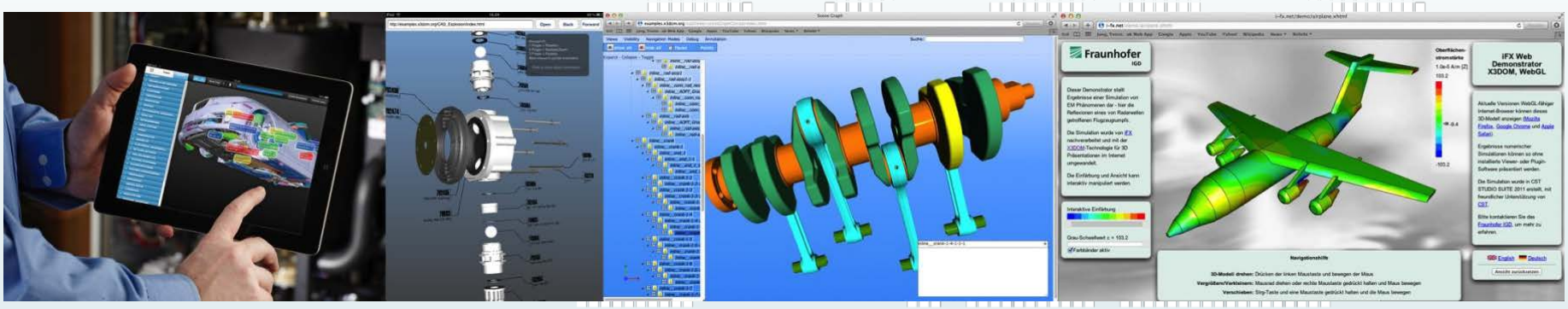
# Web3D Consortium and X3D Graphics International Standards

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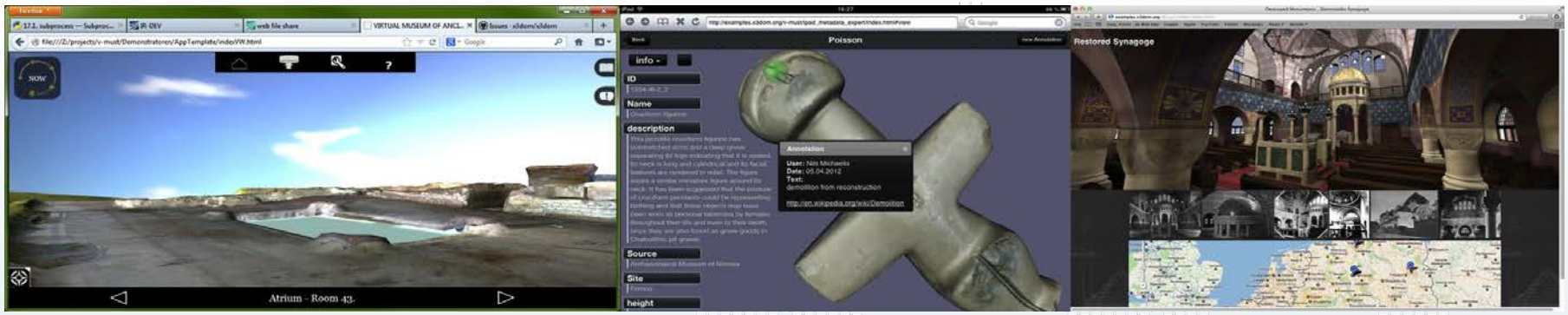
www.web3d.org

# Next-Generation 3D Web Applications

## Open Immersive 3D worlds in your browser – Web your platform




## Enhancing user experience with sophisticated visualizations

- Yesterday: Flash-based site with videos
- Today: Immersive 3D inside your native Browsers

## Increase Interest in 3D Web applications - The Web is your platform

- Geospatial
- Product presentation
- Visualization of abstract information
- Experiencing Natural and Cultural Heritage data in 3D
- Virtual Engineering

# Industry is looking at building highly synthetic 3D worlds on the Web

## Cities - Weather - building - Engineering - scientific

## and the Web is their delivery method of choice


# Mission:
# Convergence of standards
# International Collaboration
# Industry Support

# Why Are Open Standards Important for 3D?

**Creating quality 3D content is expensive:**

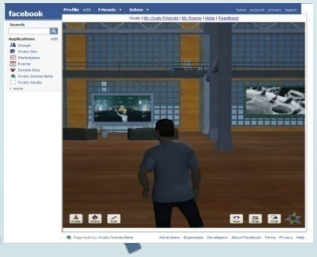
Both in time and software costs

**Something just as expensive is recreating 3D content:**

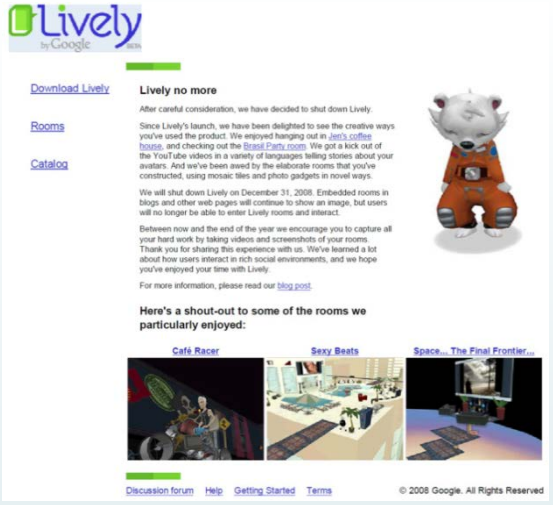
When the underlying technology no longer works

**Well-kept secret of proprietary 3D technologies:**

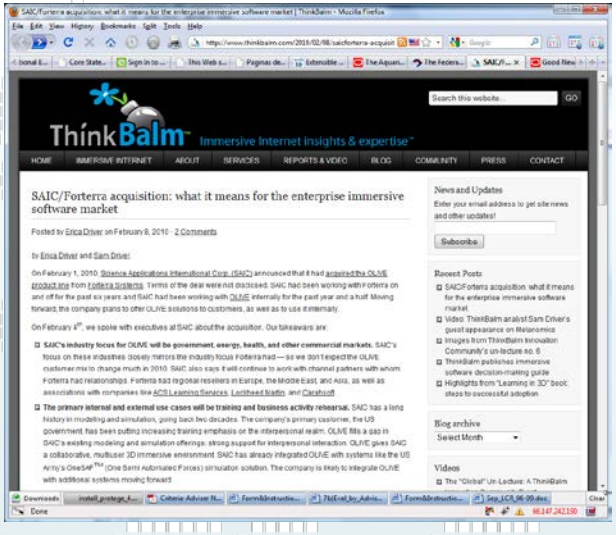
Rarely interoperable

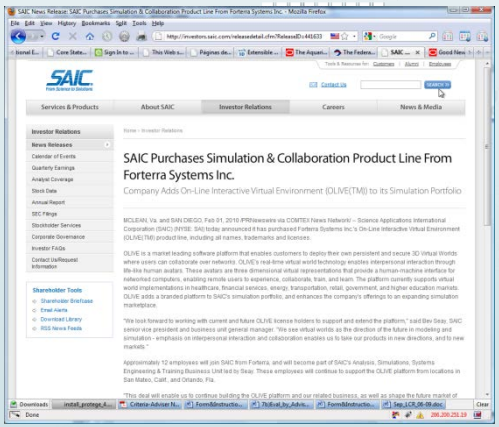



# Is your technology stable and long term?




**Where are these tools now?**




**Single vendor proprietary solutions are almost always limited**

# Is your technology extensible?

## Does it converge with open standards?

**Market Dominance: Biggest competitor wins?**

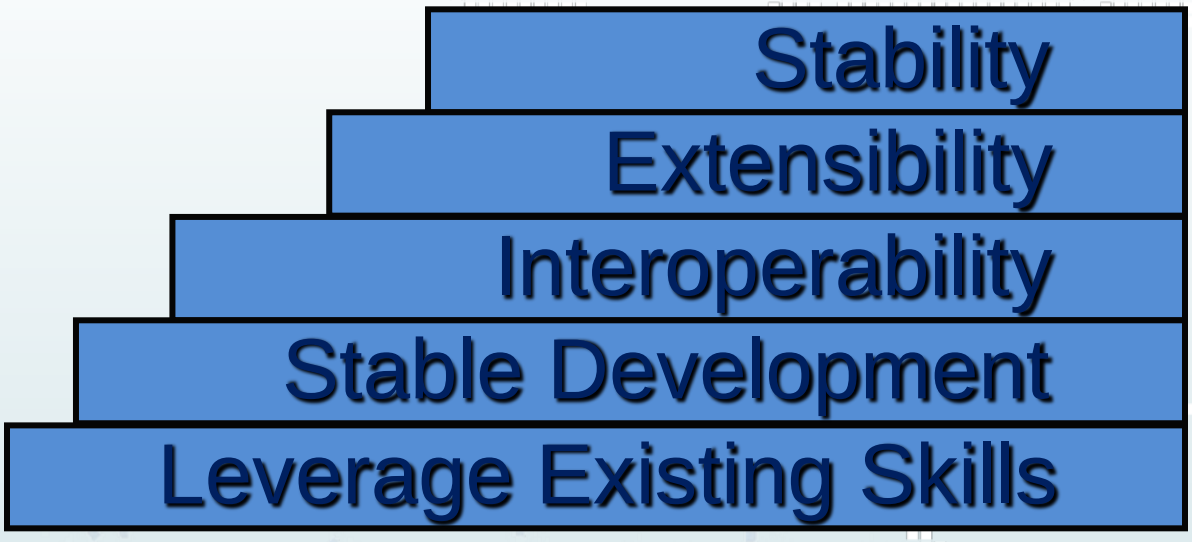
- Companies hope to “own” 3D
- Success short lived
- Close technologies
- No open standards
- Single vendor solutions

**Therefore NO Interoperability and extensibility**

# Is your technology Interoperable?


All browsers
All platforms

# Building blocks for stable 3D solutions



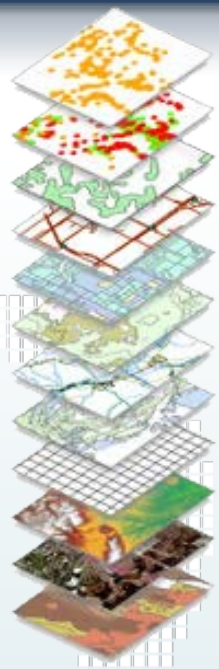

CAD

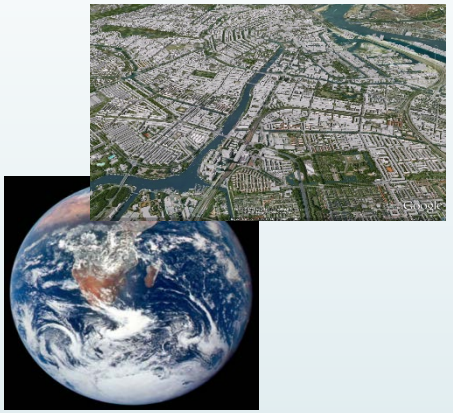

BIM

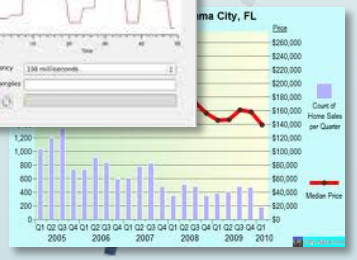

CAM


Design


Laser Scan





# Data Can Coexist

facebook twitter YouTube flickr digg Technorati vimeo LinkedIn del.icio.us myspace.com

# Standards are already in place to be used

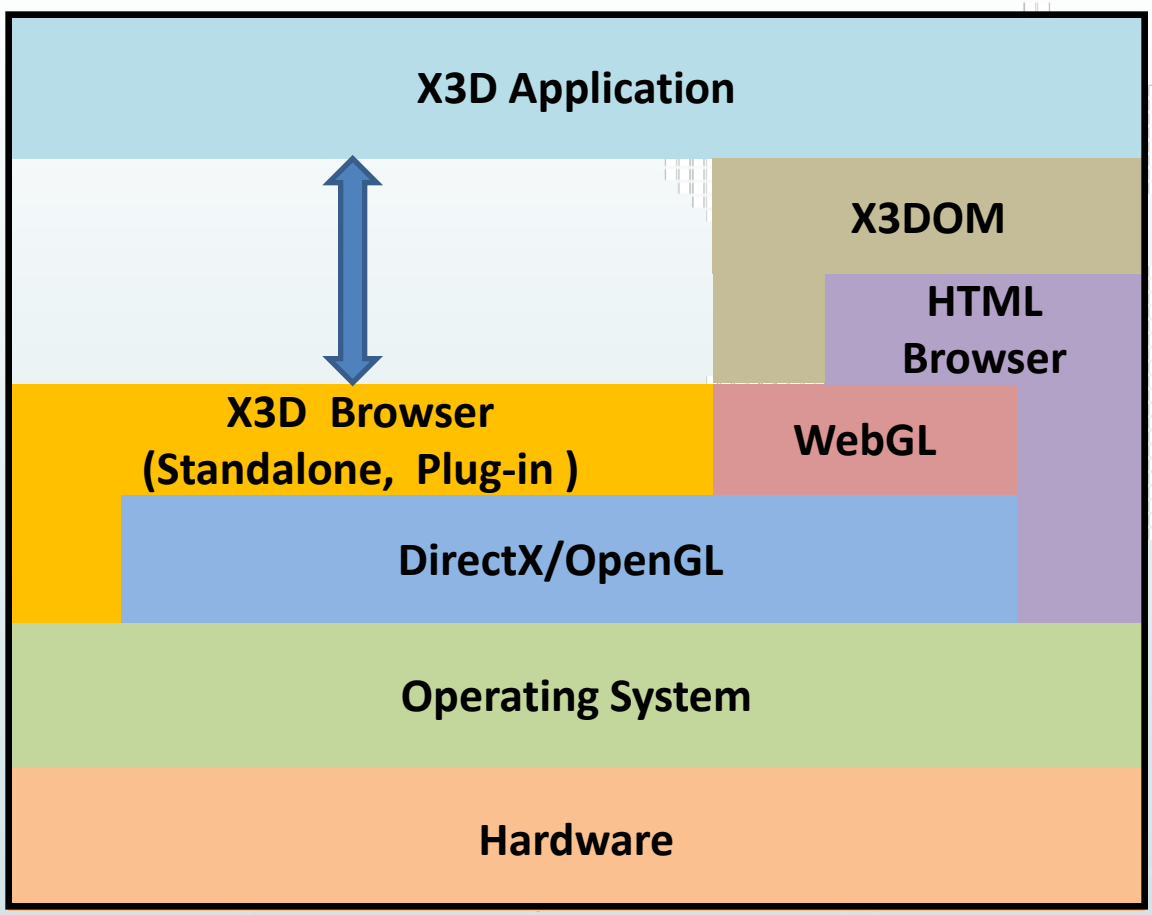




# Industry Support
# Web Browser Support

WebGL

# Graphics Stack



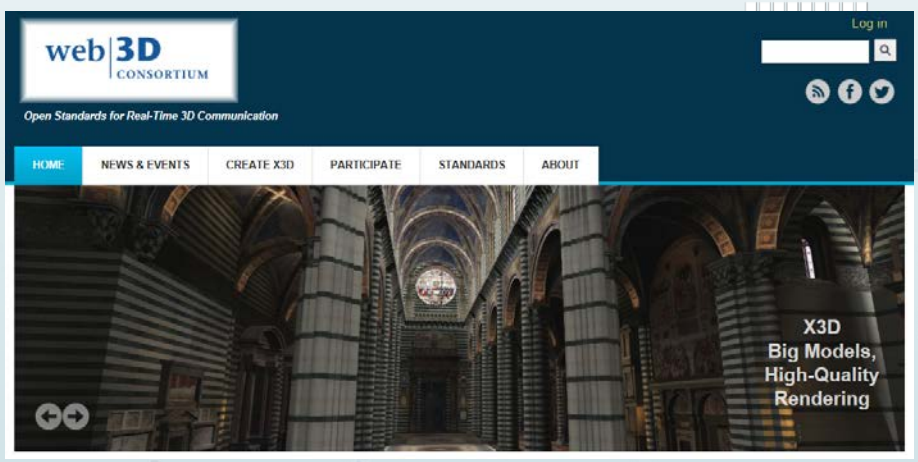

**X3D Declarative:**
**For Web Authors Vs**
**3D graphics application programmers**

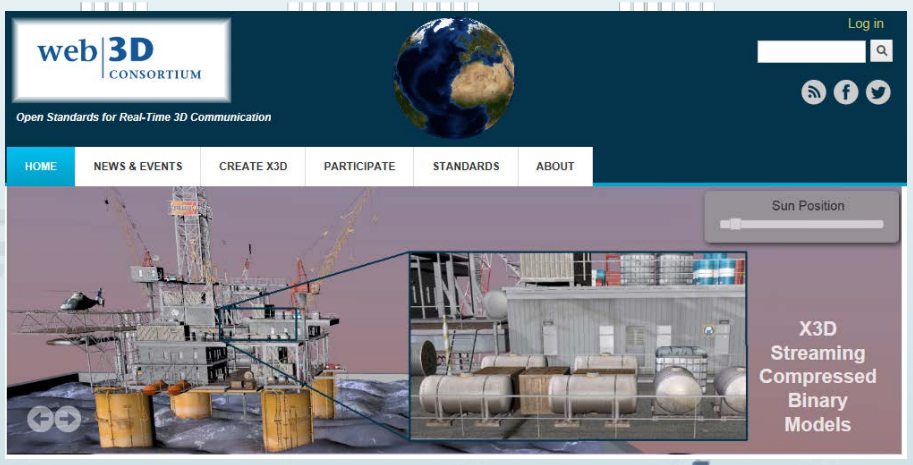
**X3DOM**
**A layer above WebGL**

# Your Web3D world is here…

## Extensible 3D (X3D) Graphics International Standards

X3D technology ensures an open 3D framework that is open, interoperable and extensible



# Who is developing X3D?

**Web3D Consortium founded in 1997 to support and advance the VRML specification now called X3D**

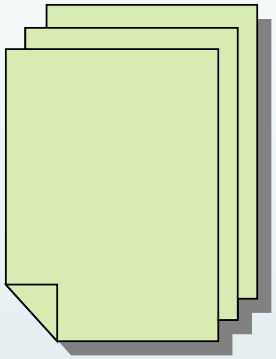
- International
- Non-profit
- Member-funded
- Industry group

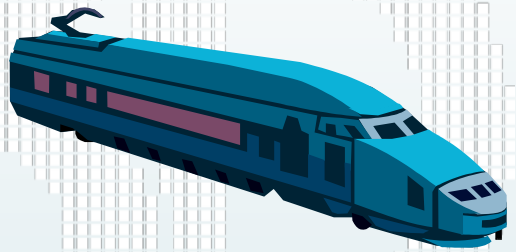
**Our members span business, academia, government and the military**

# What is X3D?

## Second Generation VRML

## A complete solution for 3D on the Web





**File Formats:**
**XML, ClassicVRML, Binary**

**Run-Time Engine (player)**
**1 open source and 9 players**

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

**Meshes • lights • materials • textures • shaders**
**Interaction • Animation • Audio/Video**

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

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

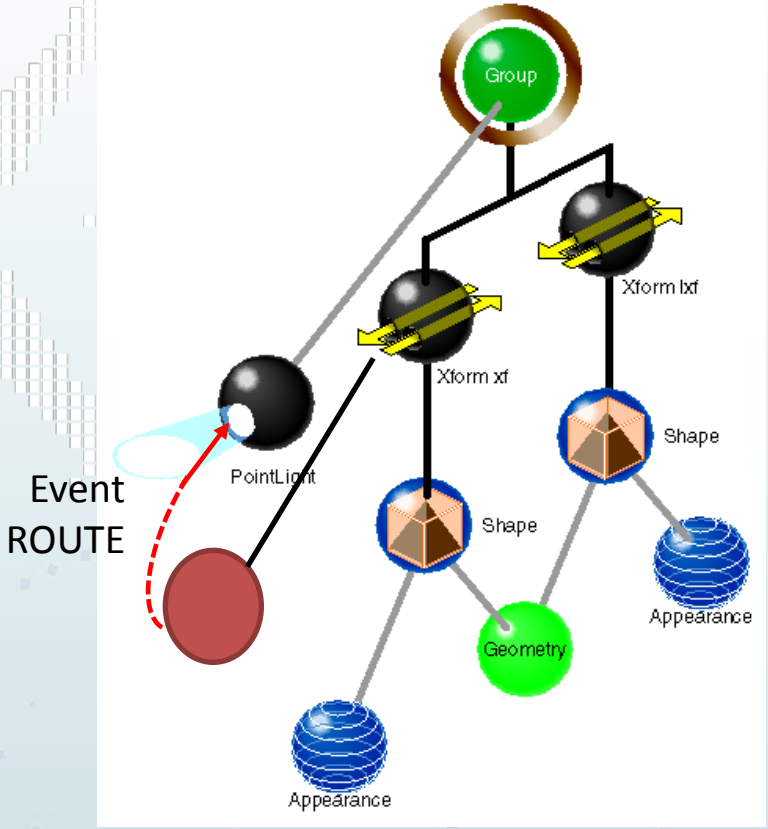

www.web3d.org

# Scene graph for real-time interactive 3D

## Delivery of virtual environments over the web

Multiple ISO-ratified encodings
- XML (.x3d)
- Classic VRML (.x3dv)
- Compressed Binary (.x3db)

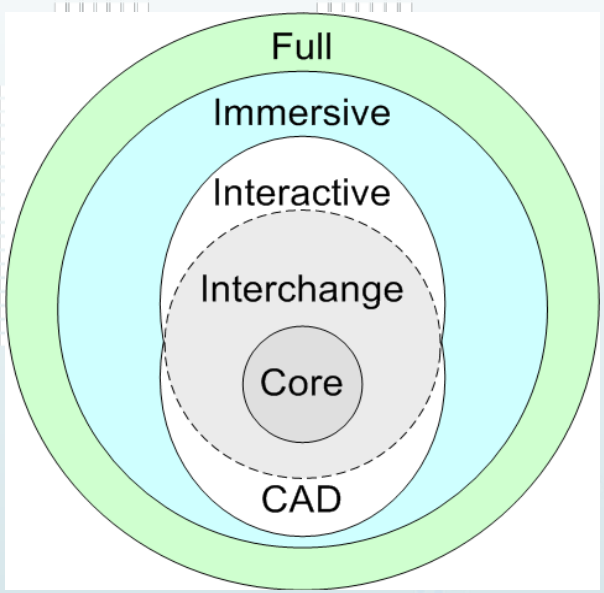
- Multiple APIs
  - ECMAScript (JavaScript)
  - Java



# X3D Profiles

http://www.web3d.org/files/specifications/19775-1/V3.0/index.html

**General Goal**:
- A 3D visualization component for any runtime environments
- Reduced complexity and implementation effort

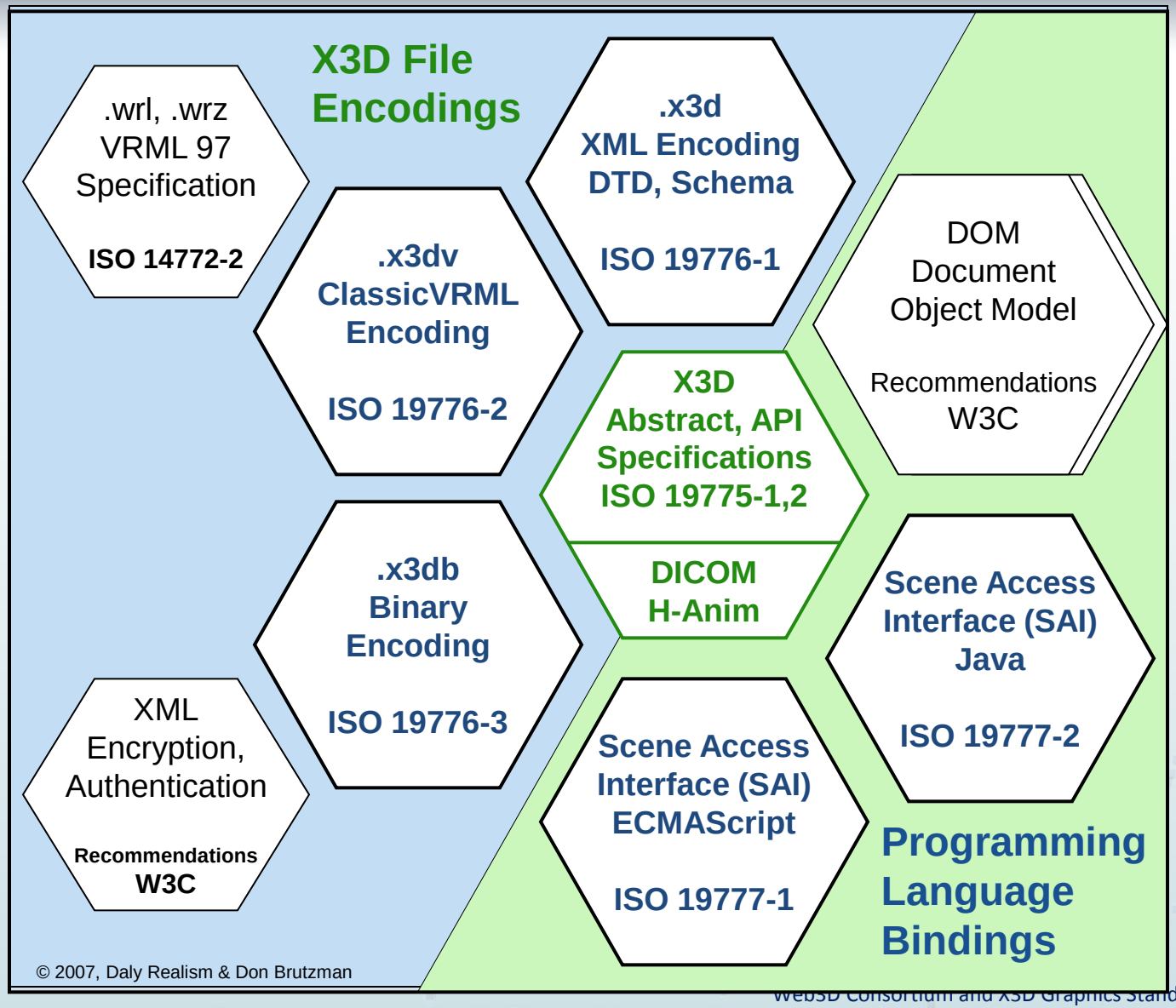



**A lightweigth X3D**
- Lightweight runtime essentials
- A Stripped down X3D Scene Graph Rendering System
- Complimentary to other external runtime systems
  ( HTML5, Mobile, OGC, W3C…)

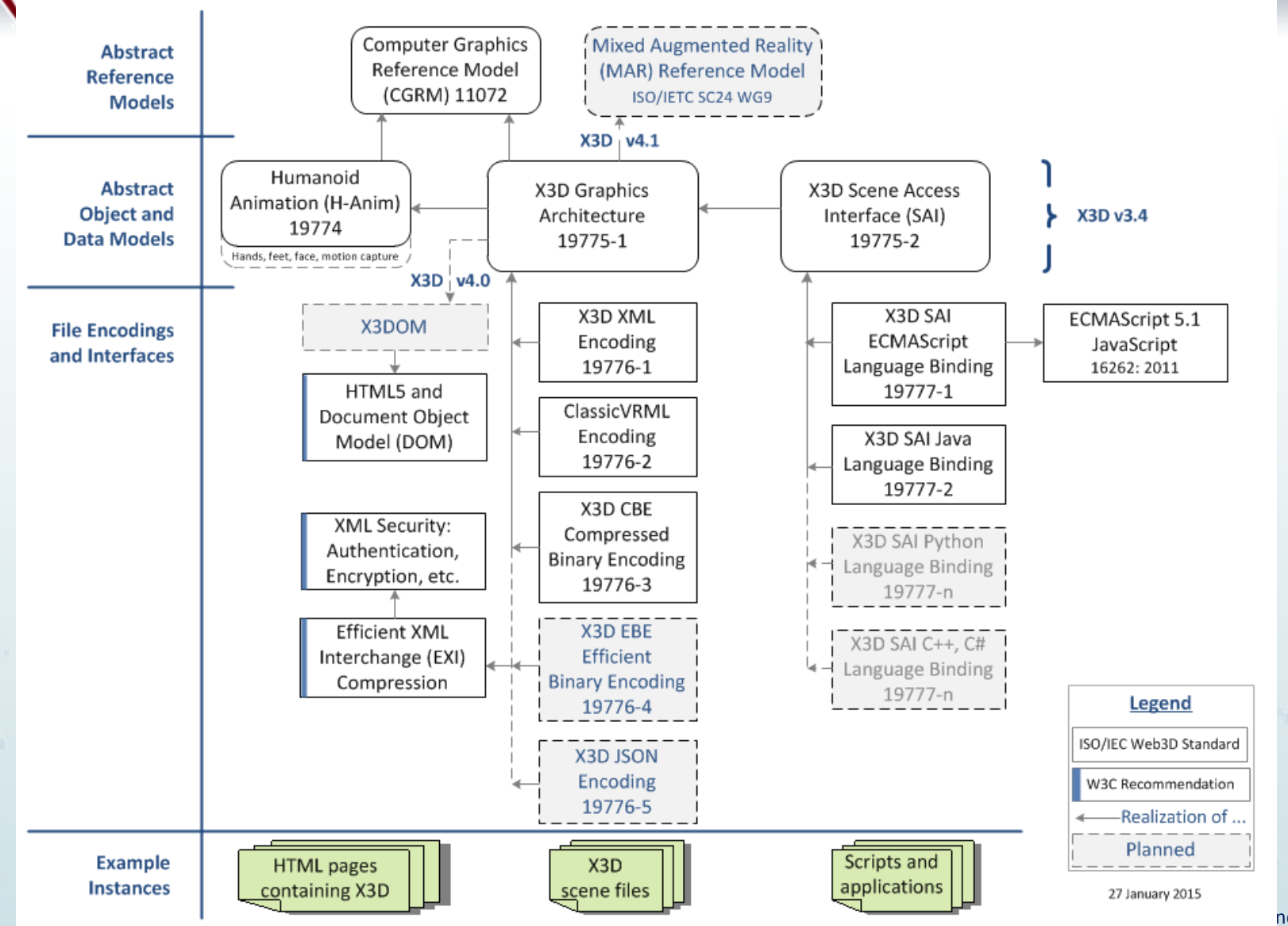
**Eliminate**
- X3D-Script
- Protos
- High-Level Sensors

**Use**
- Mobile applications
- Lightweight HTML web pages
- Augmented Reality Applications

# X3D Specifications

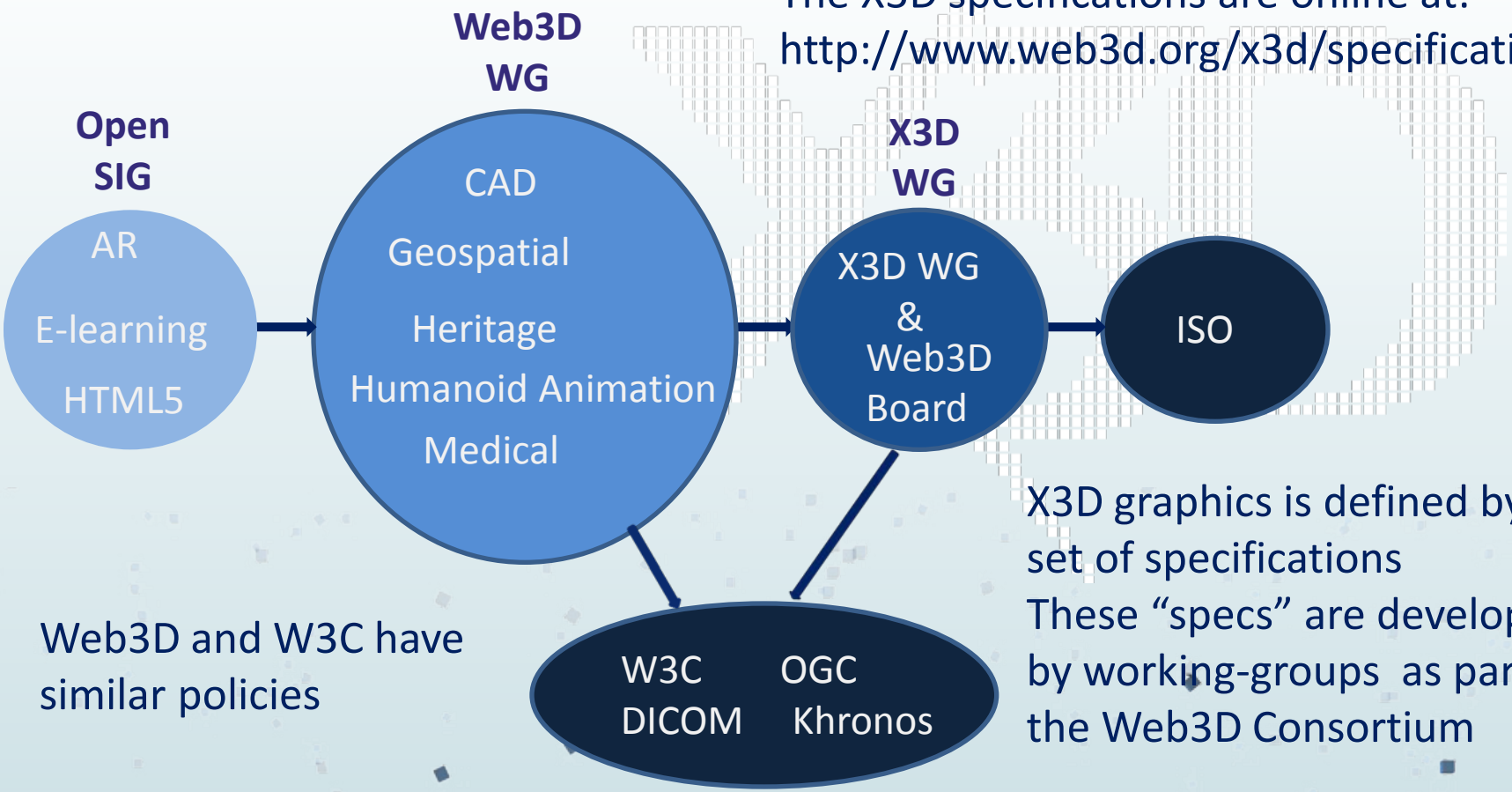


# X3D Graphics Standards: Specification Relationships



# X3D standardization Process

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




Web3D and W3C have similar policies

X3D graphics is defined by a set of specifications
These “specs” are developed by working-groups as part of the Web3D Consortium

# Proposal Requirements for Standards Contributions

**Clear definitions** are needed, what is the technology being proposed?

**Specification text** will eventually be needed that formally describes these capabilities.

**Compatibility/evolution plan** for integration with existing X3D/H-Anim standards, if needed.

**Two independent implementations** to show feasibility, at least one in open source.

**Example X3D scenes** that demonstrate common use cases for authors who want to utilize the technology.

**Intellectual property rights (IPR) commitment** that, if accepted, the technology is Royalty Free (RF) for any use.

# Adoption Process

**1. Identify Standard or Extension to existing standards**

- Study Market Trends/Requirements
- Identify Consortium Members' Interest
- Identify if this requirement falls under an existing working group charter
- Form a new working group if this does not fall under an existing working group charter

**2. Form a Working Group**

- Identify Working Group Leadership
- Identify Working Group Members (open to all Web3D Consortium members)
- Create Working Group Charter, Goals and Milestones
- Plan Meeting frequency and schedules
- Allow Invited Experts if needed

# Adoption Process

3. **Identify Previous Work**
   - Identify any related Member activities'
   - Identify output from related SIG (Special Interest Group)
   - Identify Open Source contributions available for adoption and submission

4. **Identify Requirements**

   Create Use Cases

   Create specification requirements from these use cases

   Create Proof of Concept/Interoperability experiments

   Explore partnership with other organizations as needed

# Adoption Process

5. **Create Standard or Extension**
   - Follow Consortium's IP Policy
   - Ensure Open and Consensus based solution
   - Identify at least two independent and interoperable
   - Create conformance testing suites
   - Announce member/public review of 30 days
   - Review comments and incorporate or discard with cause.
   - Complete standard or extension for submission

6. **Submit Standard or Extension for Board approval and Member vot**
   - Web3D Consortium Board of Directors review
   - Board determines if a Web3D Members vote is necessary
   - Tabulate Member vote results
   - Start ISO certification process after final Board approval

7. **ISO Certification - Follows ISO policy for all standards**

# X3D Convergence

+ web3D CONSORTIUM =

**And supported by these relationships.**

ISO

W3C WORLD WIDE WEB consortium

OGC
Open Geospatial Consortium, Inc.

ACMSIGGRAPH

KHRONOS GROUP

DICOM
Digital Imaging and Communications in Medicine

# Standards are already in place to be used

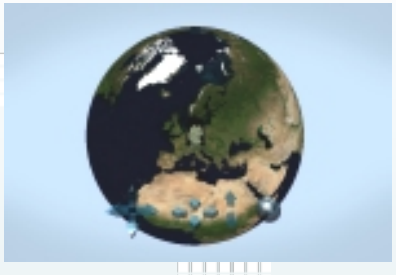




# Geospatial X3D

**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**

# OGC/Web3D Convergence

## Provide improved location enabled 3D web services for Geo data

**OGC Vision:** Achieve the full societal, economic and scientific benefits of integrating **location resources** into commercial and institutional processes worldwide

**Web3D Consortium Vision:** Provide a forum for the creation of open standards for **3D Web**, and to integrate these standards and resources into commercial markets and user education programs.

# X3D OGC standards Interoperability

- **GML**
- **CityGML**
- **KML Encoding Standard**

**Correlating approaches with OGC formats and tools**

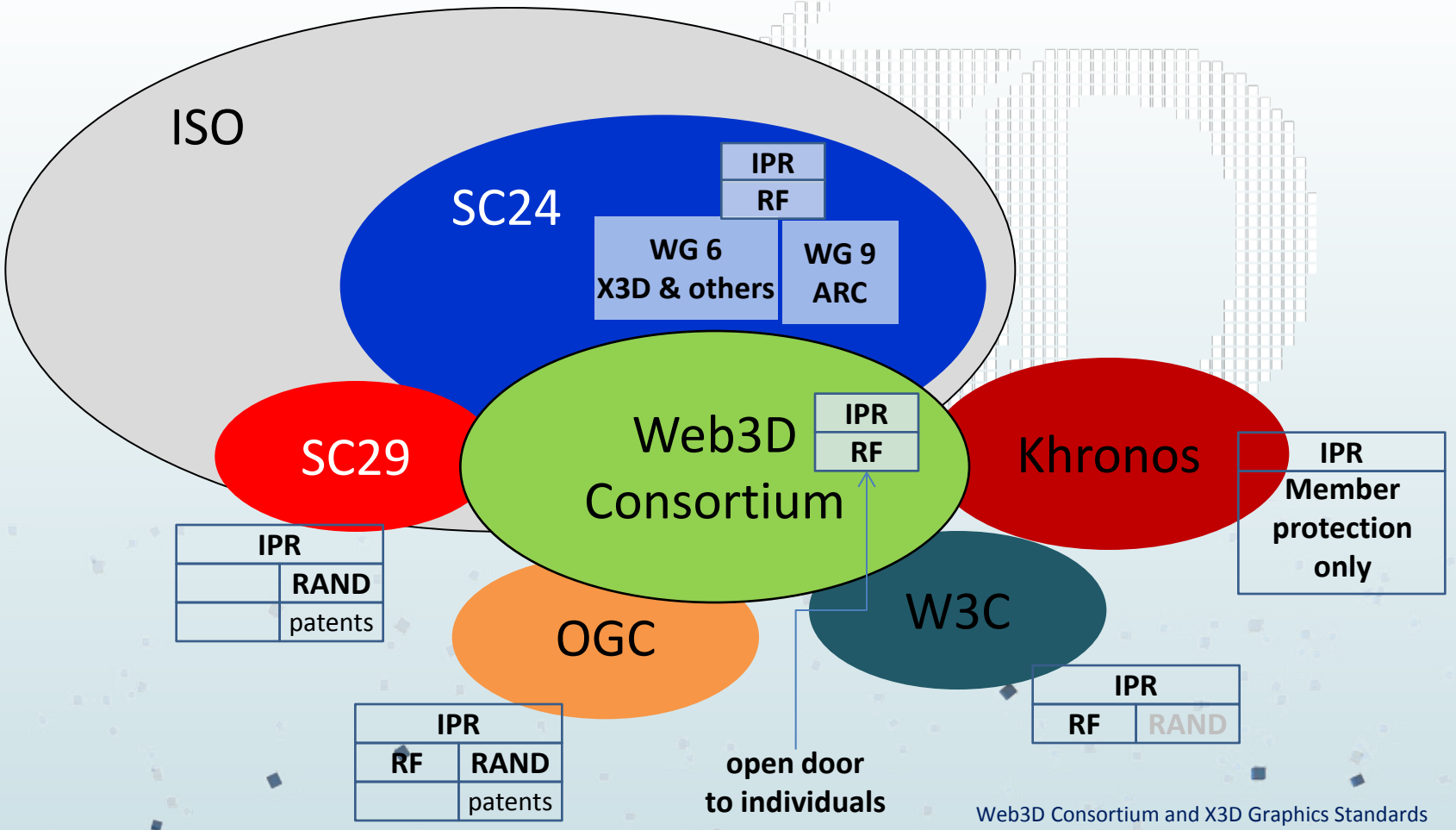
- 3D Portrayal Interoperability Experiment (3DPIE)
- 3DIM DWG
- 3D Portrayal SWG

# OGC 3DPIE and X3D

- X3D aligns with OGC 3D visualization goals
- 3D Portrayal Interoperability Experiment
- 3D Portrayal SWG participation

- Web3D Member Contributions
  - Virginia Tech – 3D Blacksburg Project
  - Bitmanagement – BS Contact Geo Browser
  - Fraunhofer – Instant Reality Browser/X3dom
  - MBARI – Sensor data underwater visualization
  - NPS – X3D Earth Project

# Web3D Liaison Relationships



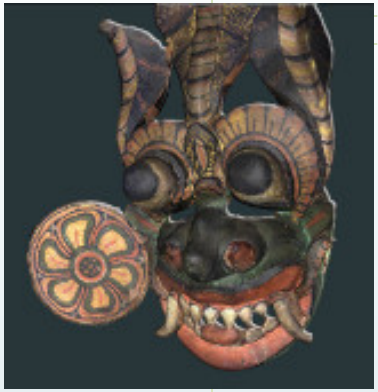
# Why do our members use X3D

- Build 3D products based on a stable 3D standard
- Avoid proprietary lock-in
- International, Conformant/ISO Standard
- Their customer are asking for open standards based technology
- Vendor neutral environment/ consensus based development
- Access to a community of world-wide 3D experts
- Consensus based participation from both end-users and software developers
- Converge with other 3D related standards

# Open Standards - X3D
# Deliver New Dimensions on the Web

# X3D: Foundation for All Markets

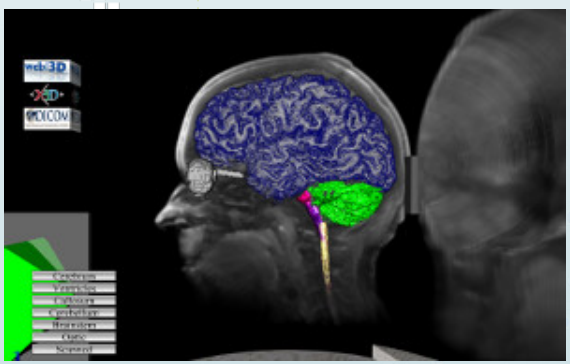
## Cultural Heritage



## Geospatial

## Augmented Reality

## Medical



# X3D: Run Anywhere

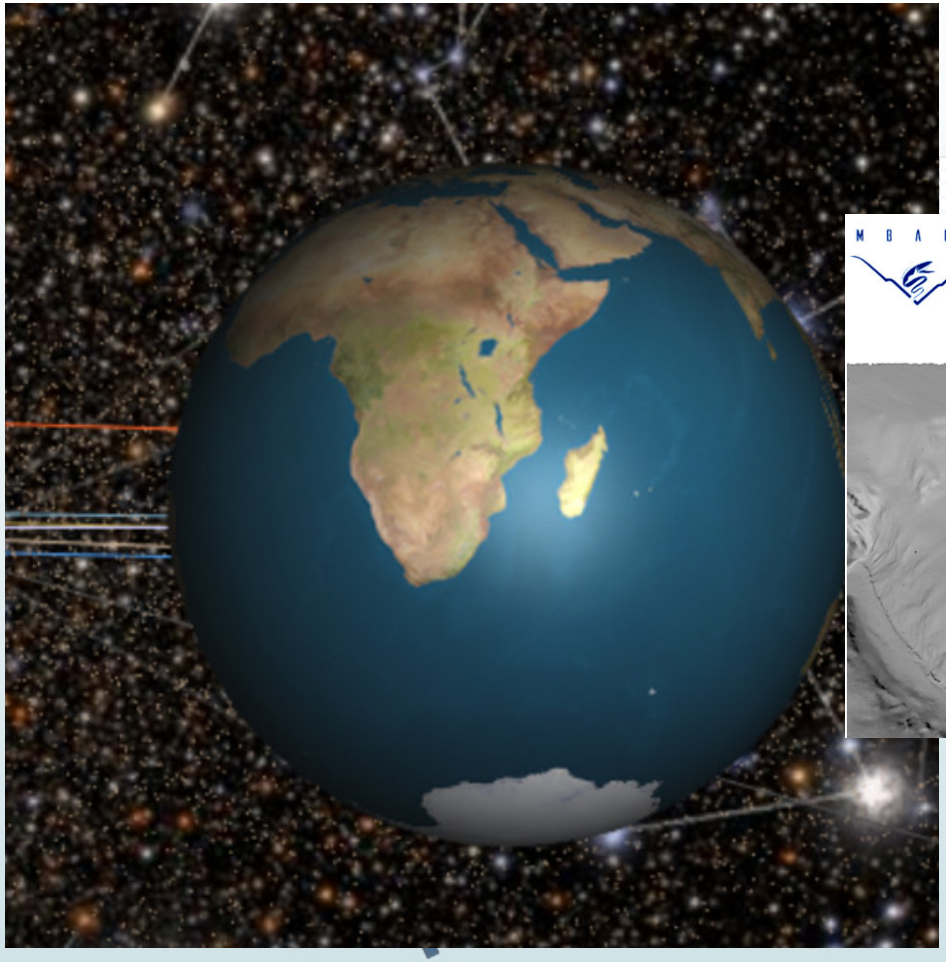

All browsers
All platforms

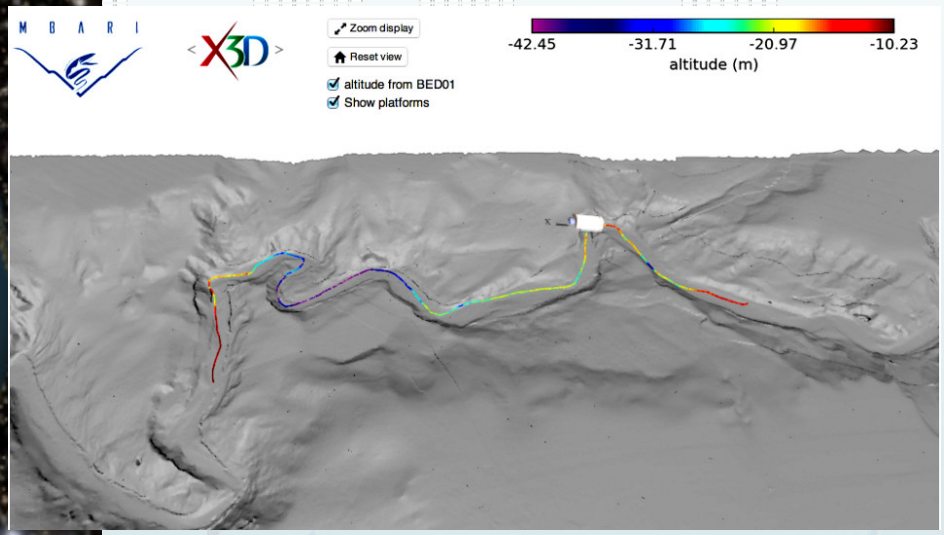
# X3D: High-Fidelity Graphics

# X3D: Archival Open Standards for Natural and Cultural Heritage

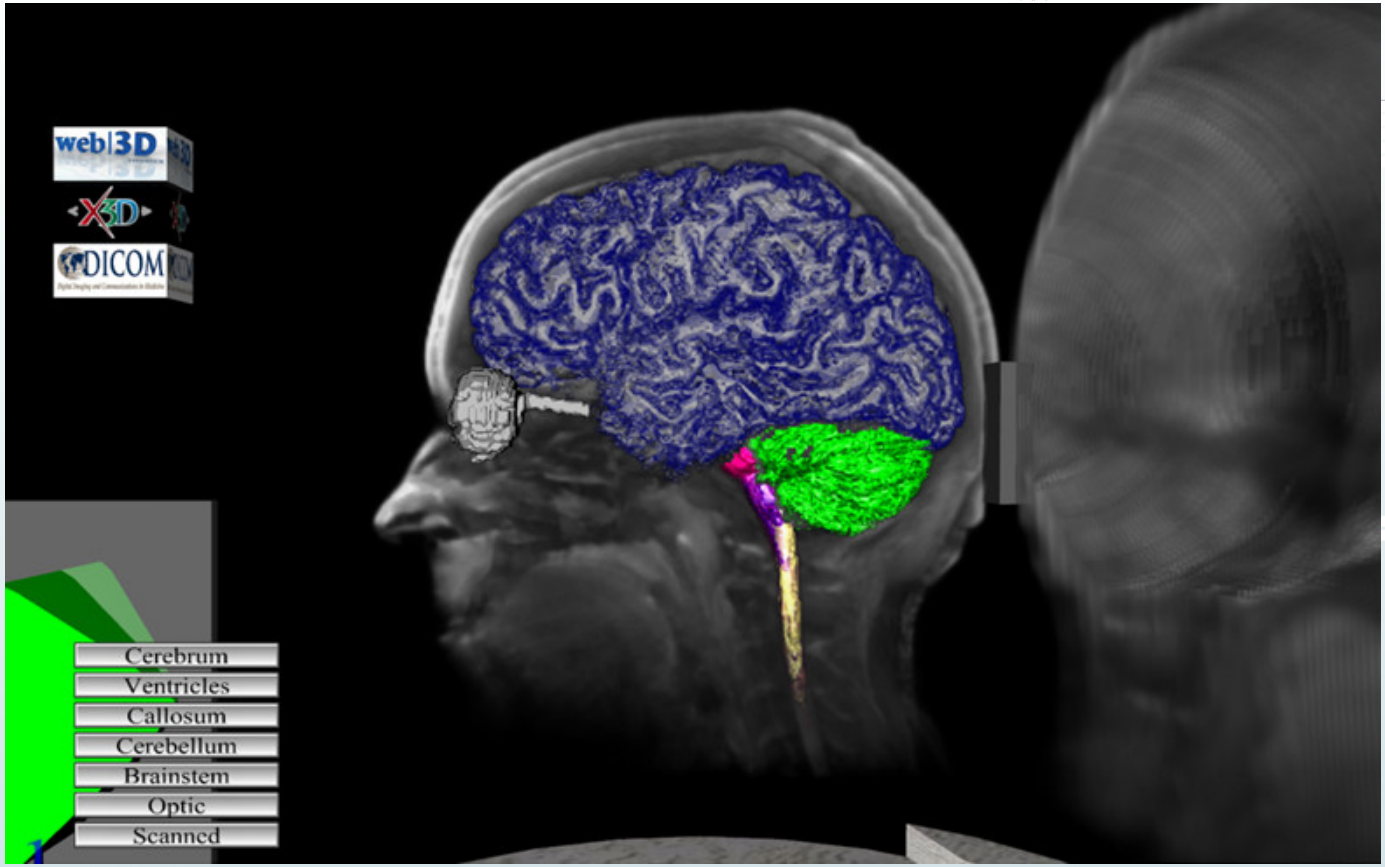
# X3D: Training & Maintenance
# Mixed Augmented Reality

# X3D: Geospatial - From Space to Ocean

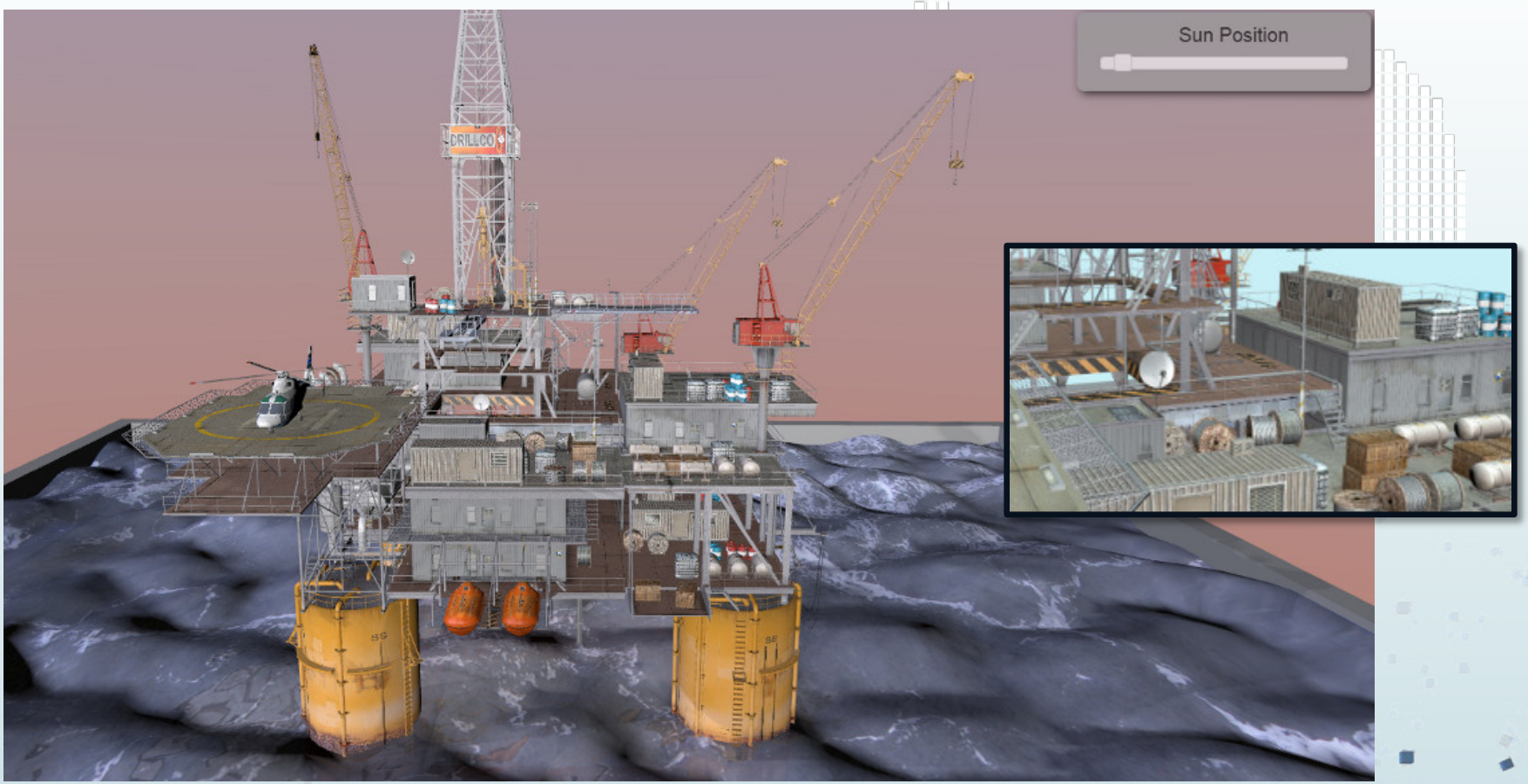




# X3D: Medical Imaging -Volume Rendering



# X3D: Large-Model Compression
# Streaming, Shadows, Animation



# World Wide Adoption

# What are we working on now?

**X3D version 3.4**. Evolution of Capabilities tracks steady improvements across all 3D graphics for the Web.

**X3D version 4.0**. HTML5 support using X3DOM as a prototype and Open Web Platform (OWP) Integration for deployment in any Web page.

**X3D version 4.1.** Mixed and Augmented Reality (MAR) for emerging VR-AR devices and user interfaces.

**Humanoid Animation**. H-Anim models that include hands, feet, face and motion capture (mocap), also suitable for medical use.

**X3D Efficient Binary Encoding**. Smaller file sizes, faster decompression, and streamable deployment of animation.

**X3D JSON**. Complete JavaScript Object Notation encoding for Javascript programmers.

# 2015 Web3D Conference

## 20th International Conference on 3D Web Technology

**A MAJOR EVENT FOR RESEARCHERS, DEVELOPERS, ENTREPRENEURS, EXPERIMENTERS, ARTISTS AND CONTENT CREATORS, FOCUSED ON NEW 3D WEB AND MULTIMEDIA TECHNOLOGIES.**

## Heraklion, Crete, Greece 18-20 June

**The conference highlights capabilities and trends in interactive 3D graphics across a wide range of applications and supports research from mobile devices up to high-end immersive environments.**

**Explore methods of using, new 3D Web technologies such X3DOM, WebGL and HTML5, Flash/ Stage 3D, X3D, COLLADA, and the MPEG family.**

www.web3D2015.org

**Sponsored by:** ACM SIGGRAPH
**Co-sponsors:** Web3D Consortium and Eurographics

**Join us to celebrate our 20th anniversary**

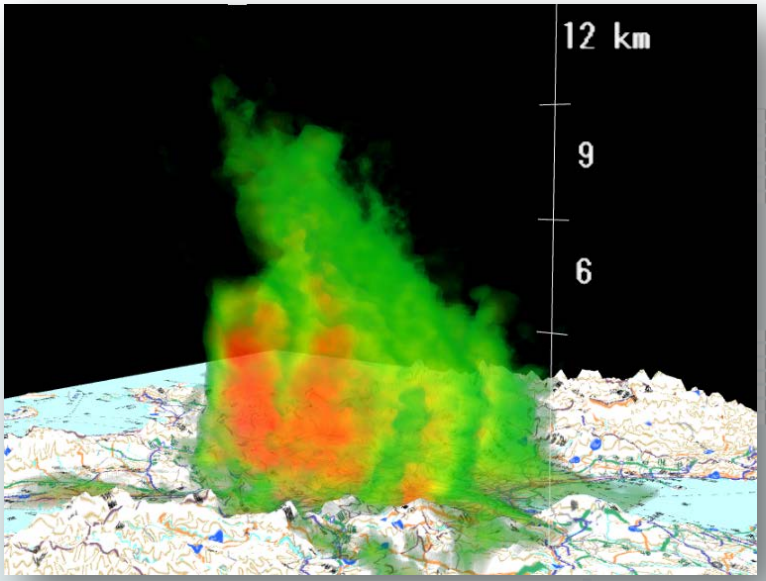
# SIGGRAPH 2015
# Los Angeles 9-13 Aug 2015

# VR Hackathon
# San Francisco 22-24 May 2015

# The National Institutes of Health joins Web3D Consortium


## X3D standards for model archive and 3D printing

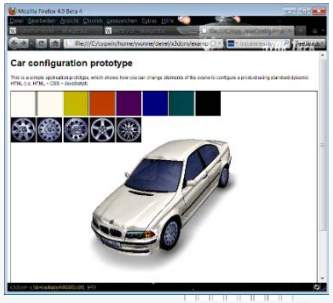
# The Toshiba joins Web3D Consortium

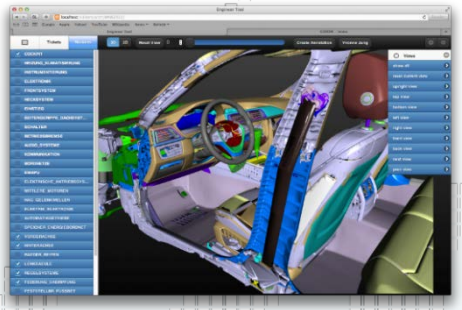



Weather data 3D visualization for observing the complete lifecycle of torrential rain

## X3D standards for Volumetric Data

# Why use X3D?



- Open source, free, and royalty-fee ISO standard
- Build highly detailed synthetic spaces
- Combines 3D geometry and animation
- Provides an Interactive and immersive 3D experience
- Scenes can run on many platforms from mobile to caves
- **Archival stability that stands the test of time**
- Efficient compressed binary encodings for high performance
- Converges with other open Standards

# Join us to Build the Future of 3D

Visit us at: www.web3d.org

To Join: www.web3d.org/join

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# Join the Web3D Evolution!

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