January 22, 2019

ISO/IEC/Web3D Status Report

Dr. Richard F. Puk
President, Intelligraphics Incorporated
Convener, ISO/IEC JTC 1/SC 24/WG 6
ISO/IEC JTC1/SC24 Liaison
to
Web3D Consortium

Web3D-related Standards Published

- **ISO/IEC 14772-1:1997/Amd 1:2003—VRML**
- **ISO/IEC 14772-2:2004—VRML EAI**
- **ISO/IEC 19774:2006—H-Anim**
- **ISO/IEC 19775-1:2013—X3D (vs. 3.3)**
- **ISO/IEC 19775-2:2010—X3D SAI (vs. 3.3)**
- **ISO/IEC 19776-1:2016—X3D XML Encoding (vs. 3.3)**
- **ISO/IEC 19776-2:2016—X3D Classic VRML Encoding (vs. 3.3)**
- **ISO/IEC 19776-3:2016—X3D Compressed Binary Encoding (vs. 3.3)**

Current SC24 Standards Projects

- **ISO/IEC FDIS 19774-1:201x—H-Anim architecture (Vs. 2.0)**
- **ISO/IEC FDIS 19774-2:201x—H-Anim Motion Animation (Vs. 1.0)**
- **ISO/IEC DIS 19777-1:201x—X3D ECMAScript language binding (Vs. 2.0)**
- **ISO/IEC WD 19777-2:201x—Java LB Vs. 3.3**
- **ISO/IEC CD 19777-3:201x—C LB Vs. 3.3**
- **ISO/IEC CD 19777-4:201x—C++ LB Vs. 3.3**
- **ISO/IEC CD 19777-5:201x—C# LB Vs. 3.3**
- **ISO/IEC WD 19777-6:201x—Python Vs. 3.3**

Current SC24 Standards Projects (cont.)

- **ISO/IEC IS 18520:2019—Benchmarking of vision-based geometric registration and tracking method for MAR**
- **ISO/IEC FDIS 18039:201x—MAR reference model**
- **ISO/IEC CD 18038:201x—Sensor representation in MAR**
- **ISO/IEC CD 18040:201x—Live actor and entity representation in MAR**
- **ISO/IEC AWI 21858:20xx—MAR content information model**

SC24 Anticipated Projects

- **X3D EXI Encoding now that EXI specification approved by W3C**
- **X3D JSON Encoding (in work)**
- **HL7 Integration including metadata**
- **X3D Version 4.0 discussions underway**

X3D Version 4.0

- **Goal: Add changes needed to better support HTML5 while remaining backwards compatible as much as possible**
- **Primary areas of investigation:**
  - **Event handling and interoperability with the DOM**
  - **Compatibility with X3DOM & X-cite (formerly Cobweb)**
  - **Support for non-HTML environments**

X3D Version 4.0 Functionality

- **The following is under consideration:**
  - **Annotation component**
  - **Multi-Planar Reconstruction**
  - **Enhancements to Geospatial component**
  - **Haptics**
  - **Corrections and improvements**
  - **NetworkSensor node**
  - **3D printing & 3D scanning enhancements**
  - **glTF access including mesh support**
  - **Advanced materials and advanced lighting models**

X3D Version 4.0 Functionality (cont.)

- Projective texture mapping
- Camera nodes
- Sensors (e.g., GPS)
- Special support for VR
- H-Anim facial animation
- H-Anim internal organ representation

- **Two independent implementations for submission to ISO**
- **Use simultaneous NP/CD ballot mechanism wherever possible**

X3D 4.0 Discussion

- **Questions to be answered**
  - **Can the event models of X3D and the HTML5 DOM be accessed compatibly?**
  - **Are two different data models necessary—one supporting X3D events and one supporting DOM events?**
  - **How much backwards compatibility can be achieved?**
  - **Must a non-HTML implementation also support DOM activities?**

X3D 4.0 Discussion—Guidelines

- **Preferred considerations:**
  - **Backwards compatibility should be considered first.**
  - **X3D authors should not need to sense the environment to tailor their programs.**
  - **Programs should behave the same in every environment.**
  - **Both HTML5 and non-HTML5 environments should be possible.**

X3D 4.0 Discussion—Deletions?

- **Capabilities minimally used:**
  - **Layout component—Should be removed**
  - **GeoOrigin —Currently deprecated but recently discovered to be needed in some instances**
  - **Programmable Shaders component—Should this be removed with shader functionality reserved for browser implementers?**

X3D 4.0 Discussion—Worthy Additions?

- **Capabilities that would expand the ease of use based on long-term research:**
  - **AdvancedMaterials node(s)**
  - **Shadows (perhaps just an on/off switch)**
  - **Flexible body physics**
  - **CSS integration**

X3D 4.0 Discussion—Worthy Additions?

- **Capabilities that would expand the ease of use based on long-term research (cont.):**
  - **Projective texture mapping**
  - **Support for H-Anim 2.0**
  - **Profile between Core and Interchange**
  - **Is an HTML5 profile needed?**
  - **Is a 3D Printing and scanning profile needed?**
  - **Better point control (shape, size, splat, etc.)**

Administrative Needs

- **In addition to technical aspects of standards development, the following should also be considered:**
  - **Urgent need to develop X3D vs. 4.0 text.**
  - **Urgent need to develop new and modified features in existing browsers where two implementations have not yet occurred.**
  - **Urgent need for new active participants in SC24 standards development**
  - **Urgent need for representation on related non-SC24 standards developments**

End of Presentation

January 16, 2018

ISO/IEC Information

- Standards committees
- Process
- Organization
- Relationship to Liaison Organizations

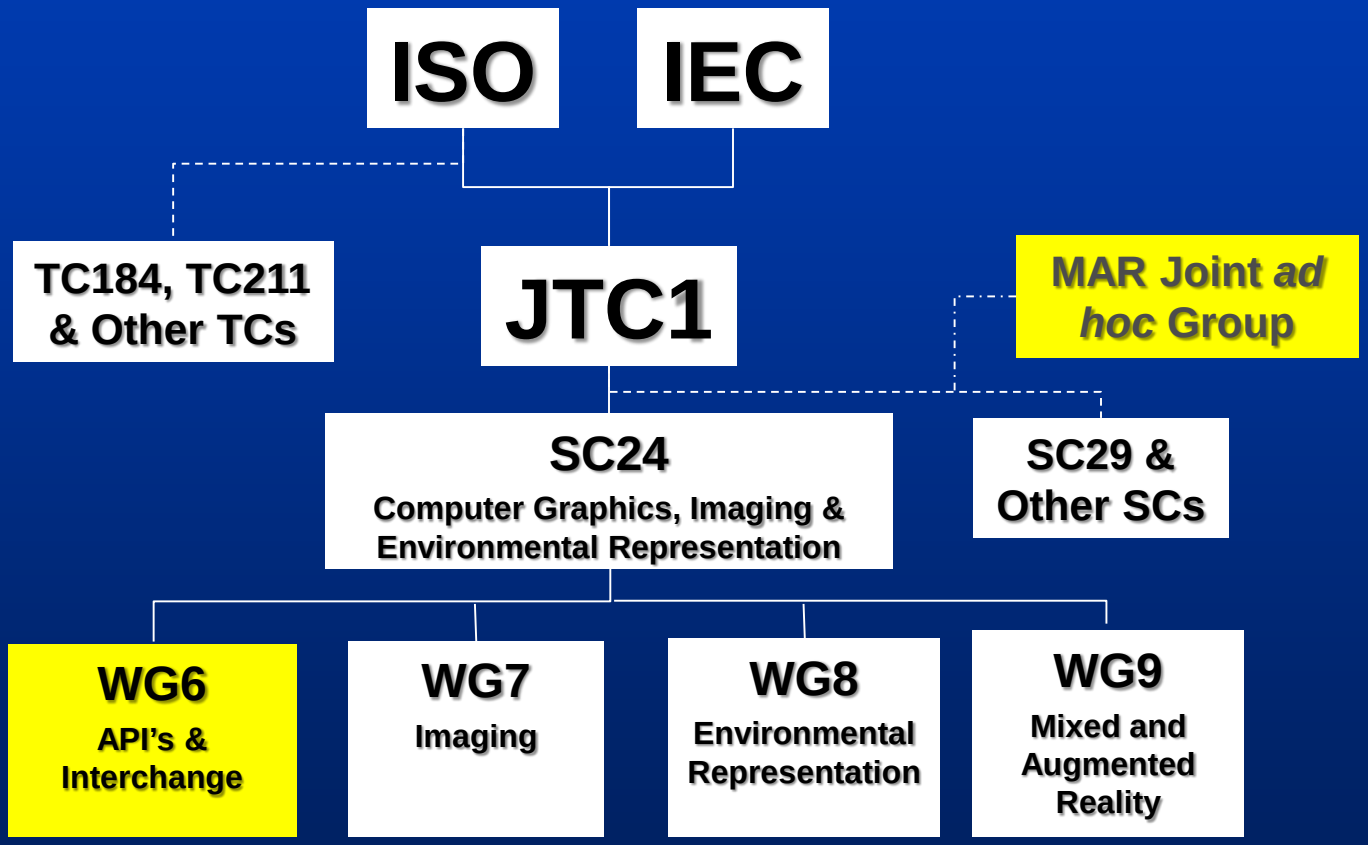
ISO

- **Worldwide federation of standards bodies**
  - **1 per country**
  - **US = ANSI, Germany = DIN, Korea = KATS, etc.**
  - **www.iso.org**

JTC1-Joint Technical Committee 1

- **Joint committee of ISO and IEC**
  - **Since 1976**
  - **Handles ISO/IEC information technology**
  - **1/3 of all ISO, IEC work**

ISO/IEC JTC1/SC24



SC 24 and Web3D Consortium

- Category C Liaison
- Cooperative Agreement
  - Spells out rights and procedures
  - Web3D Standards submitted as Committee Drafts
  - Technical work done by Web3D
  - Editorial and technical review done by SC 24
  - ISO standard owned by both parties separately

Web3D Procedures

- Technical work initiated by BOD
- Technical work occurs within a Web3D WG
- Two independent implementations required for Web3D approval and ISO submission
- Both BOD and Membership must approve forwarding to ISO
- X3D WG provides architectural control and design integrity check

ISO Projects

- Each new standard, amendment, or revision requires a new project.
- Projects are approved by JTC1 based on New Work Item Proposal (NWIP).
- New projects require about 6 months to be approved and can be submitted at any time.
- Web3D drafts are processed as HTML documents.

ISO Procedures

- Input text from Web3D registered as Committee Draft
- CD is circulated for review and ballot (4 months).
- Comments received are only justification for changing the text
- Technical changes may induce another balloting round.
- When ready, last CD is registered as DIS and circulated within JTC1 for vote.
- When ready, last DIS is registered as DIS and circulated within JTC1 for YES/NO vote.
- Final Text published as International Standard.

Types of standardization

- **New standard:** New independent specification
- **New Part:** Independent portion of a standard within an overall standard. Ex.: X3D Part 2: SAI
- **Amendment:** Changes (modifications, additions, deletions) to existing standard. Ex.: Amendment 1 to X3D Part 1
- **Revision:** Makeover of existing standard and/or incorporation of amendments (considered for each standard at least every five years or required after two amendments). Ex. X3D 2008
- **Registration:** Add new optional nodes, PROTOs, or other items focused at specific targets

Possible Future Web3D Work

- **Additional functionality for X3D**
  - **New nodes**
  - **New components**
  - **New profiles**
- **Additional parts to X3D standards**
  - **Binary Encoding based on EXI**
  - **JSON Encoding**
  - **Additional language bindings**
- **Revised non-X3D Web3D standards**
  - **Revision to ISO/IEC 19774—H-Anim**
- **New non-X3D Web3D Standards**

Contact Information

Dr. Richard F. Puk
President, Intelligraphics Incorporated
7644 Cortina Court
Carlsbad, CA 92009

Tel: +1-760-753-9027
E-mail: puk@igraphics.com