X3D Graphics Standards: Specification Relationships

Abstract Reference Models

- Computer Graphics Reference Model (CGRM) 11072
- **Mixed Augmented Reality (MAR) Reference Model** ISO/IEC 18039

X3D v4.1

Functional Specifications

- Humanoid Animation (H-Anim) 19774 — **Hands, feet, face, motion capture**
- X3D Graphics Architecture 19775-1 — v3.3
- **GL Transmission Format (glTF)** — .gltf, bin
- X3D Scene Access Interface (SAI) 19775-2

X3D v4.0

File Encodings and Interfaces

- **X3D DOM integration**
- HTML5 and Document Object Model (DOM)
- XML Security: Authentication, Encryption, etc.
- Efficient XML Interchange (EXI) Compression

- X3D XML Encoding 19776-1 — .x3d
- ClassicVRML Encoding 19776-2 — .x3dv
- X3D CBE Compressed Binary Encoding 19776-3 — .x3db
- **X3D EBE Efficient Binary Encoding 19776-4** — **.x3de or .exi ?**
- **X3D JSON Encoding 19776-5** — **.x3dj or .json ?**

- X3D ECMAScript Language Binding 19777-1 — .js — ECMAScript 5.1 (JavaScript) ISO/IEC 16262: 2011 — **6.0?**
- X3D Java Language Binding 19777-2 — .java .class **.jar** — Java Language Specification version 7: 2013 — **v8?**
- **X3D (SAI) C++, C# Language Binding 19777-n** — .cpp .cs — C++, C# Language Specifications ISO/IEC 14882, 23270
- X3D (SAI) Python Language Binding 19777-n — .py — Python Language Reference python.org

Legend

- ISO/IEC Web3D Standard
- W3C Recommendation
- ⟵ References ...
- **Planned**, Proposed

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Example Instances

- HTML pages containing X3D
- X3D scene files
- Compressed glTF shapes
- Scripts and applications