Intro to glTF - Current & Future

Alexey Medvedev
Meta
glTF - 3D Asset Transmission Format

AUTHORING FORMATS

AUTHORING TOOLS

Import & Export
- Remix / Publish

AUTHORING TOOLS

Transmission
- Exchange

VIEWERS & ENGINES

Optimization & Verification
- Testing and Editing

glTF TOOLS

Interchange

Distill

USD, Material X, FBX, MDL ...

Blender
3DS MAX
Maya
Adobe
...

glTF’s focus is on enabling optimized run-time delivery of 3D Assets

This work is licensed under a Creative Commons Attribution 4.0 International License
Increasingly Foundational for Other Standards

**Customized interactive 3D avatar format based on glTF + extensions**

* (.vrm extension)

**Streamlined streaming and rendering large-scale 3D geospatial datasets**

* uses glTF + extensions
  * (.b3dm and .i3dm extensions)

**gltF as an ISO standard solidifies global recognition and adoption as a 3D asset format**

**ISO/IEC 23090-14:2023**

MPEG-I for immersive media experience uses glTF + extensions as its scene graph

* (.mp4 extension)

**ISO/TS 32007 brings glTF 2.0 as a supported 3D asset into PDF**

**ISO/IEC IS 19775-1:2023 (X3D)**

MPEG-I for immersive media experience uses glTF + extensions as its scene graph

* (.x3d extension)
Cross Standards Cooperation

Cooperation between glTF and USD ecosystems is a significant industry benefit

Asset format to enable 3D content to be pervasively delivered and displayed on a wide diversity of native and web viewers, applications and engines

Extensible framework and ecosystem for describing, composing, simulating, and collaboratively navigating and constructing 3D scenes

Multiple open-source projects including OpenPBR and MaterialX

Metaverse Standards BOF
Presentation by glTF/USD Interoperability Working Group
Tuesday 11:30AM Room 710
glTF PBR Materials Roadmap

Incremental consolidation and meticulous specification of *proven and accepted industry practice*

<table>
<thead>
<tr>
<th>Metal / Roughness</th>
<th>Transmission</th>
<th>Specular</th>
<th>Index of Refraction</th>
<th>Sheen</th>
<th>Volume</th>
<th>Clearcoat</th>
<th>Emissive Strength</th>
<th>Dispersion</th>
<th>Subsurface</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>2020</td>
<td>2021</td>
<td>2022</td>
<td>2023/4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>In development</td>
</tr>
</tbody>
</table>

This work is licensed under a Creative Commons Attribution 4.0 International License

© The Khronos® Group Inc. 2024 - Page 5
glTF Spatial Computing Roadmap

- Interactivity
- Physics
- Complex Scenes
- Audio
glTF Interactivity Extension

- Uses behavior graphs to add logic and behaviors to glTF assets
  - Interactive assets portable across eCommerce sites, applications, XR experiences etc.
  - Focus on safety, portability and ease of implementation

- Distillation of engine accepted practice
  - Unity (Visual Scripting), Unreal (Blueprints), Nvidia Omniverse (Action Graph)

- Invitation for Public Comments issued!
  - Draft Specification on GitHub | Khronos webinar on interactivity
  - Feedback on GitHub pull request | glTF Interactivity Graph Authoring Tool (WIP DCC React App)
**glTF Physics**

- Express the physics properties of assets in a platform independent way
  - Provides procedural animation
  - Makes scenes more interesting, believable, and dynamic
- Enables scene understanding
  - Possible with render geometry, but much more efficient with physics
- **Rigid Bodies**
  - Collision geometry | Rigid bodies
  - Motions | Materials
  - Joints | Filters

Distillation of widely adopted physics engines practices

[Scan QR code for specification]

Feedback welcome!
glTFX : glTF eXternal References

- Meet user requirement to reference multiple glTF assets
  - Complex scenes, Level-of-Detail, streaming, smart loading, scene change...

- Adds a new glTF file type (glTFX)
  - Contains eXternal reference to glTF files
  - New file does not specify any meshes, animations, materials, etc. directly

Join in the ongoing discussions at https://github.com/KhronosGroup/glTF-External-Reference/tree/main/explainers
Khronos 3D Commerce

Making 3D Pervasive - in the Real World

Build Once, Use Everywhere
Developing tools and techniques for 3D assets to be reliably and consistently used and displayed across diverse platforms and engines

Multiple Projects Underway
Render Showcase - evolve and expand Render Fidelity Site
Tone Mapping (PBR Neutral), exposure and lighting
Apparel: Skeletal & Facial Anchoring, Virtual Try-On, Stitching / detailing, Simulation

Content Developers test and validate assets

Sample Viewer Asset Display Exemplar
Validator Asset Correctness

The equivalent of an API Conformance Test Suite (Vulkan has >3M tests)

Asset Library Showcase & Test Assets
Asset Generator Generate unit tests

Public comparison of multiple engines
1) Early warning of inconsistencies
2) Incentive to implement functionality

Render Showcase Web-based display comparisons
glTF 2024 Development Roadmap

Development Period for Draft Specifications

- **1Q24**
  - Interactivity
  - Procedural Textures
  - External References

- **2Q24**
  - Animation+ (Blender interface)
  - Audio
  - Physics

- **3Q24**
  - PBR Subsurface
  - Video Textures

This work is licensed under a Creative Commons Attribution 4.0 International License