

# glTF Complex Scenes

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Daly Realism

# Complex Scenes - Introduction



# Rendering Multiple Objects



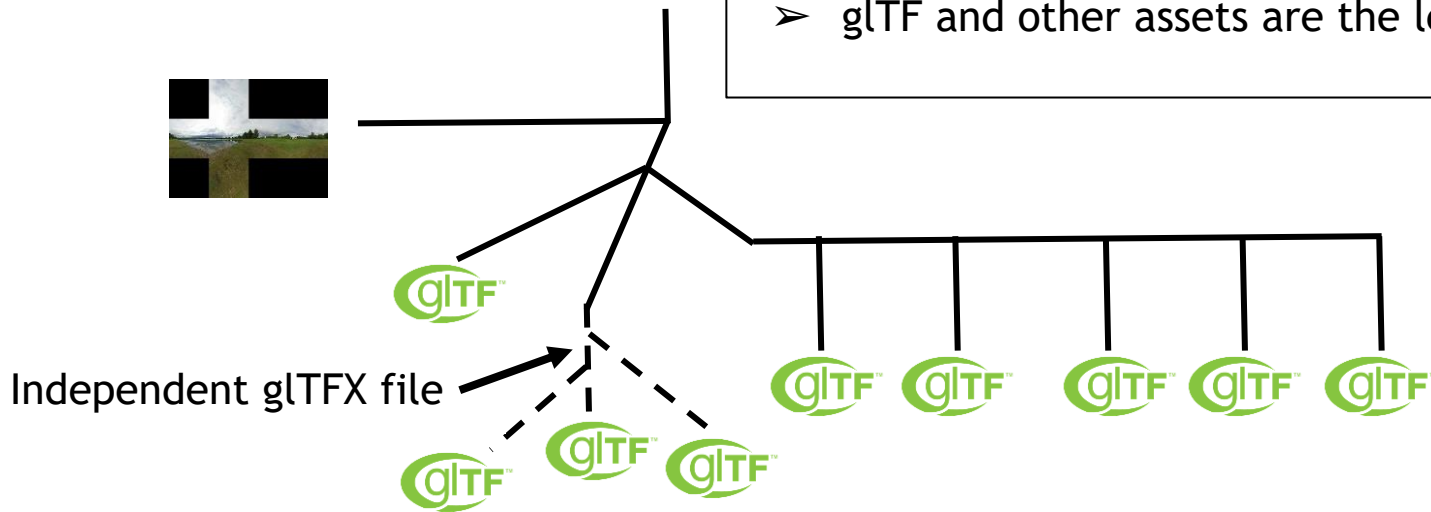
# Documentation & Results

- Investigations done in
  - Lighting
  - Level of Detail
  - Picking and Parenting
  - Billboard
- Results in [glTF External Reference](#) repo in [Explainers](#)
- Forked version of glTFSampleViewer used (publicly available)
- All models publicly available (*glTF-Sample-Assets?*)
- Blog post (Summer 24 release)
- Work done by UX3D



# glTFX Structure Definition

- glTFX defines the structure of the scene
- glTF and other assets are the leaves



Environment map: © 20214, Cheeseplus. Creative Commons, Share-Alike  
[http://wiki.polycount.com/wiki/File:Cubemap\\_Sorsele\\_humus.jpg](http://wiki.polycount.com/wiki/File:Cubemap_Sorsele_humus.jpg)



# Cross Object Lighting



# Level of Detail

- **Several possible transition metrics**
  - Distance from camera
  - Display Coverage
  - Asset extent
  - Asset file size
  - Quality pixels (inspired by IKEA's PQPM)
- **Avoid over-sensitivity**
- **Recommendation**
  - Allow multiple metrics
  - Require all metrics be the same within an LOD collection

# Level of Detail





# Picking & Parenting



# Billboard



# Next Steps

## Khronos

- Develop Specification Text from Explainers
- Develop SampleViewer to support Specification
- Develop Test cases to support Specification and SampleViewer

## How you can help

- Review and comment on Explainers
- Identify use cases that should be supported
- Join Khronos and participate in specification draft

Target draft specification: 4Q2024



# Credits

All models from glTF-Sample-Assets repo / [Showcase](#), licensed as CC-BY, except the room. See below for details.

- Hurricane candle holder. © 2021, Wayfair; Eric Chadwick, Artist.
- Table lamp. © 2022, Wayfair; Eric Chadwick, Artist.
- Side chair. © 2020, Wayfair; Eric Chadwick, Artist.
- Couch. © 2024, DGG; Eric Chadwick, Artist.
- Room. Not yet published video from Khronos. Image believed to be from IKEA.

# Video Credits

## Models

- **Lighting**
  - [Buildings: DaoTown](#) modified by Leonard Daly
  - [Wall lamp](#): bryanthealy modified by UX3D GmbH
  - [Ground](#): BLM National Operations Center Geospatial Imaging
- **Level of Detail**
  - [Flask](#): Austin Crane (Euclid) modified by UX3D GmbH
- **Picking**
  - [Studio Apartment](#): zamorev4d modified by UX3D GmbH
  - [Chess \("A Beautiful Game"\)](#): ASWF and Ed Mackey
- **Billboards**
  - [Khertvisi Fortress](#) - Raw Scan by Nick
  - [Billboard Trees](#): by EFX
  - Font - [Roboto](#): Christian Robertson. Apache 2.0

# glTF ⇔ USD Interoperability

*Better to turn into graphic slide, but starting with text*

- Adobe has started work on writing converters to/from USD
- [Publicly available](#) under [Apache 2.0 license](#)
- Khronos is evaluating the [conversion for glTF](#)
- Important Considerations
  - ~~— What does round-trip mean, especially for features not in USD~~
  - What features can be converted without loss
  - Is there support for all glTF geometry primitives
  - What is the material system for USD
  - What needs to be tested
  - What test models need to be developed
- Major Sections for testing
  - File format
  - Geometry
  - Material
  - Animation