Exploring the Artistic Frontier:
Unleashing Creativity in 3D Models with glTF and PBR

Eric Chadwick, Wayfair
echadwick@wayfair.com
Eric Chadwick, Staff Technical Artist, Wayfair
echadwick@wayfair.com

- 6 years at Wayfair
- Workflow improvements for 3D rendering and interactivity
- 20 years in game development
- Polycount admin, forum + wiki
Eric Chadwick, Staff Technical Artist, Wayfair
echadwick@wayfair.com

- 6 years at Wayfair
- Workflow improvements for 3D rendering and interactivity
- 20 years in game development
- Polycount admin, forum + wiki
Khronos Group for open source standards, including glTF
Weekly conference calls: glTF features, interop, extensions, workflow, tooling, tutorials ...
Triangles: 336,300  Material: Diffuse texture
Retopology in 3ds Max
Unfold UVs, Relax UVs, Pack into 2048x1024
Bake To Texture: normal, diffuse, occlusion
Generating Textures

- ambient occlusion
- roughness
- metalness
- base color
- normal bump
- iridescence strength
- iridescence thickness
Channel-Packed Textures
Final Textures

- base color
- normal bump
- orm
- iridescence
BabylonJS Exporter for 3ds Max
BabylonJS Exporter for 3ds Max
Blender glTF

https://docs.blender.org/manual/en/2.80/addons/io_scene_gltf2.html
Blender glTF

Different rendering models, no glTF renderer in Blender, feature compatibility not 100%

In development… Principled v2 BSDF shader node
https://projects.blender.org/blender/blender/issues/99447
Visual Studio Code + Cesium’s glTF Tools Extension
Editing glTF in VS Code

```json
{
  "asset": {
    "version": "2.0",
    "generator": "babylon.js glTF exporter for 3dsmax 2022 v20230608.5"
  },
  "scene": {
    "nodes": [
      0
    ],
    "nodes": {
      0,
      "mesh": 0,
      "translation": [0.4323723, 0.7163625, -0.001377244]
    },
    "name": "AbaloneShell"
  },
  "meshes": {
    "primitives": {
      "attributes": {
        "POSITION": 1,
        "NORMAL": 5,
        "TEXCOORD_0": 3,
        "TEXCOORD_1": 4
      },
      "indices": 0,
      "material": 0
    },
    "name": "AbaloneShell"
  },
  "accessors": {
    ...
  }
}
```
Materials: Before and After
What are the Iridescence Parameters? Check the spec: KHR_materials_iridescence
Iridescence Parameters

Thickness, IOR, Color

https://github.com/KhronosGroup/gltf-Sample-Assets/tree/main/Models/IridescenceMetallicSpheres
Iridescence Parameters  Metallic vs. Dielectric

https://github.com/KhronosGroup/glTF-Sample-Assets/tree/main/Models/IridescenceDielectricSpheres
glTF Extension - KHR_materials_anisotropy
Based on a Real Product

Antique Copper Barn Light on Wayfair

Brushed copper with a clearcoat finish
Anisotropy examples

Horse: Sabu Varghese
Record: Ryankusumojr
Braid: Stilfehler
Pan: NatalieMaynor/
glTF Material & **glTF Exporter** in 3ds Max
Anisotropy - Inputs
Anisotropy Texture - RGB Channels

- w/out red channel
- w/out green channel
- w/out blue channel
Anisotropy Texture - Radial Directions
Anisotropy Texture - UV Directions
Anisotropy Texture - Compared to Other Renderers
Anisotropy Texture - Normalized vs. Not
Anisotropy Texture - Normalize in Substance3D Designer


(https://shorturl.at/lwSX5)
Normal Bump - Masking
Links

glTF Iridescence
- IridescenceAbalone glTF sample asset
- KHR_materials_iridescence specification
- BabylonJS Exporters for 3ds Max, Blender, Cinema 4D, Maya, etc.
- Blender glTF Exporter Blender Manual
- Blender BSDF v2 Blender Projects
- Visual Studio Code and Cesium glTF Tools
- IridescenceMetallicSpheres glTF sample asset
- IridescenceDielectricSpheres glTF sample asset

glTF Anisotropy
- AnisotropyBarnLamp glTF sample asset
- KHR_materials_anisotropy specification
- 3ds Max glTF Exporter help

Bonus! Adding Material Extensions to glTF Models

Slides and Videos