USD Projects and Resources

Projects and resources relating to Pixar's Universal Scene Description

This page originated at https://github.com/vfxpro99/usd-resources/blob/master/Readme.md

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USDZ

- Apple's Reality Composer exports scenes to USDZ
- Sketchfab has nearly a half million USDZ files available for download
- USDZ at Apple WWDC 2018 presentation
- UsdSkel for Apple's ARKit
- Apple News USDZ files can be embedded in Apple News articles
- ARKit USDZ format assets from Apple
- Samples from FusionAR USDZ format assets
- GiDiOdev a few USDZ format assets

Reference

- Pixar Resources
  - openusd.org The official website
  - The History of USD, by F. Sebastian Grassia and George Elkoura
  - USD Interest Google Group
  - Introductory Videos Several video presentations by Pixar
  - UsdSkel All about skinning schemas for USD
  - USD based pipelines 2016 presentation on Pixar's use of USD in the pipeline
  - Simple Shading In USD Pixar's docs for USD preview material
  - Using USD with Apple's technologies WWDC 2017 presentation
  - USD at UTS Animal Logic Academy video presentations
  - USD Cookbook Colin Kennedy's USD code and asset samples
  - Dreamworks USD Integration
  - Luma USD Integration Brief notes on Luma's pipeline
  - Unity USD SDK
    - Unity USD SDK Presentation about the Unity USD SDK
    - Unity USD SDK Design notes on the Unity USD SDK's API
    - Unity USD SDK Details on using the Unity USD SDK
  - Autodesk resources
    - Autodesk landing page for USD (includes recording of past presentations)
    - Experimenting with USD in Game Pipelines Autodesk Developer Summit, GDC 2022
    - GTC Course: Getting Started with USD for Collaborative 3D Workflows
    - GTC 2022 Sessions (free, registration required)
      - Exploring USD: The HTML for 3D Virtual World
      - Transforming Global Film Production Workflows with Omniverse
      - Best of Both Virtual Worlds: Bridging Ignition and Isaac Sim

Tools

- gltf2usd Convert gltf 2.0 files to USD
- usd_from_gltf Convert gltf to USDZ from Google
- animated cubes script Generate an animated file for testing
- USD Manager USD Manager by Dreamworks (hyperlinked USD file browser/editor with plugin support)
System Integrations

- Apple’s Finder and Preview application can display USD files natively
- Model I/O Apple’s Model I/O brings USD to Metal
- SceneKit Apple’s SceneKit can read and write USD files for native rendering on all Apple platforms
- USD Qt Luma Pictures has created some reusable Qt widgets to work with USD
- UsdView Live coding Live Coding in USD
- Windows Explorer Activision has created a deep integration of USD into Windows desktop

DCC Integrations

- Aero Adobe’s Project Aero
- AL_USDMaya Animal Logic’s plugin (now unified with the Autodesk Maya plugin)
- AL_USDMaya Animal Logic’s Asset Resolution system
- AL_USDMaya Presentation about the AL_USDMaya workflow
- Arnold Luma Pictures USD bridge for Arnold
- Blender Work in Progress Blender Exporter
- CityEngine 2020.1 has USD Import and Export support
- Gaffer USD is available for SceneReader node and SceneWriter node from v0.42.0.0
- Houdini Deprecated Pixar plugins
- Houdini Solaris SideFX integration of USD with Houdini
- Katana
- Maya Autodesk Maya plugin
- Millefiori MPC’s USD based Sequence Editor
- Multiverse Scene assembly, set dressing, and inter-op with DCC applications
- Nuke DreamWorks USD plugins for Nuke
- NVIDIA RTX USD is supported for asset interchange on the RTX platform
- NVIDIA Omniverse A USD collaboration and visualization platform
- nxt_graphs_usd A library of USD graphs/nodes for use inside NXT.
- Open/Walter Rodeo FX’s USD plugin suite for Arnold, Houdini, Katana and Maya.
- SketchUp Dr. Wave’s USD Sketchup plugin
- TiltBrush TiltBrush v15 can export USD camera tracks
- UsdVol for Katana UsdVol to Renderman bridge for Katana
- Wizart DCC Platform native and extensible USD Editor

Engine Integrations

- Unreal Unreal 4.18 includes a USD importer
- Unity USD SDK Full C# bindings to the USD SDK
- USD for Unity USD and Alembic importer/exporter plugin for Unity

Science and Research

- Large-Scale Cinematic Visualization using Universal Scene Description Sandia National Laboratories
- NoMemoryBVH No Memory BVH for ray tracing acceleration

Hydra

- AMD ProRender AMD ProRender raytracing Hydra delegate
- GTC 2015 Jeremy Cowles’ GTC2015 presentation introducing Hydra
- Hydra Cycles Tangent Animation’s Hydra plugin for Blender’s Cycles renderer
- Hydra Houdini Dreamworks’ Hydra plugin for Houdini
- HydraNSI Usdview Hydra delegate for 3Delight NSI
- Intel hdOSPRay Hydra + Intel’s Open-Source OSPRay interactive path tracer
- Switch Victor Yudin has built a game using Hydra as the render engine
- Tutorials Tutorials on using Hydra as a stand-alone render system
- USD-tests Examples for learning USD and Hydra APIs

Sample Assets

- Samples from Pixar Several assets are available for testing here
- Samples from NVIDIA Attic Scene and more in development
- Samples from Blender Institute Animated characters and fluid simulations
- Samples from SideFX Various scenes from Houdini launch events and tutorials
- Samples from Walt Disney Animation Studios Moana Island Scene data set
- Photogrammetric Sponza data set from Intel

Building

There are a variety of strategies for building USD.
• **Official USD repo** The repo includes a robust build script that pulls canonical dependency sources, and can build for all supported platforms.
• **USD Build Club** This is the most thorough and flexible method for building USD and all its dependencies for macOS and Windows. Dependencies are fetched from canonical sources.
• **Ubuntu scripts**
• **Rez**
• **RodeoFX's dependency builds** Includes tarred sources for USD dependencies at vfxplatform point revisions.
• **USD Superbuild**
• **USDPluginExamples** A collection of example USD plugins and plugin build tools.

**Distros**

- linux, windows
- nVidia has a distro, and Python3 bindings
- Apple, macOS
- Apple has a build available here with USDZ tools
- Docker Container
- Saturn
- Windows build recipes, and AppVeyor build of binaries.
- usd-core on PyPi
- USD core libraries, sans the imaging components and tools
- Azure build artifacts

**Syntax Highlighters**

- Animal Logic VSCode Highlighting (.usd, .usda, .usdc)
- Animal Logic VSCode Highlighting at VS Marketplace
- Syntax Highlighting for vim, emacs & sublime (.usda)
- Sublime Syntax Highlighter (.usd, .usda)
- Notepad++ Highlighter (.usda)
- PyCharm Plug-in (.usda)

**Asset Resolvers**

- URI resolver by Luma Pictures
- S3 URI resolver Western Digital's S3 asset store resolver
- RodeoFX resolver RodeoFX's Replace Resolver
- turret_usd: Animal Logic's URI resolver for turret

**FileFormat plugins**

- usdat: DreamWorks usd ASCII format with templates. usdat allows the definition of a common template layer for an asset. Properties and references can be defined at asset install time as part of the reference to that asset when it is added to a scene, rather than using a separate composition arc like an override or a variant.

**Upgrade Guides**

- Upgrading Houdini From USD 20.08 to 21.02, describing the work required to upgrade Houdini's USD library
- Upgrading Houdini From USD 21.02 to 21.05, the adventure continues
- Upgrading Houdini From USD 21.05 to 21.08, tl;dr: a zero-effort upgrade

**Contribute**

Contributions are welcome - see the contribution guidelines

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