

OpenColorIO

Birds of a Feather 2017

opencolorio.org

<https://github.com/imageworks/OpenColorIO>

ocio-dev@googlegroups.com

Agenda

- Introduction
- State of Project
- OCIO v2.0
- Group Discussion

Introduction

- Sean Cooper
 - Rochester Institute of Technology
 - Sony Pictures Imageworks - Jan 2016
 - OCIO Contribution - Jan 2017
 - aka I'm new, but I'm eager to help

OCIO Leadership

Owners

- Erik Strauss - SPI Chair
- Larry Gritz - Open source savant
- Sean Cooper
- Malcolm Humphreys
- Robert Molholm
- Mark Boorer
- Matthias Scharfenberg

OCIO Project Status

- **v1.0.9** - *Oct 8, 2013*
 - *A lot has happened since 2013...*
 - ACES 1.0.x
 - HDR - HDR10, HDR10+, HLG, Dolby
 - Explosion of GPU computing

OCIO Project Status

- **v1.0.9** - *Oct 8, 2013*
- **v1.0.10** ~50 commits since last tag
 - **Added**
 - Support yaml-cpp > 5.0.1
 - Truelight support for writing
 - CDL XML parsing
 - Add args/kwargs support to Python
 - Add description field to Look objects
 - Description field for Looks
 - TravisCI & Appveyor
 - ACES 1.0.3 documentation
 - **Changed**
 - Website layout (minor)
 - **Fixed**
 - Improved Python 3 compatibility
 - CSP file read
 - Houdini LUT creation
 - GPU shader Log bug
 - Build when using libc++
 - Free memory access in YAML
 - LUT files with Windows-style endings
 - MacOS string corruption in Python
 - Platform specific fixes
 - FileFormatTruelight bug
 - Lut1DOp clamp and precision
 - Houdini Cube bake w/ Look
 - YAML/TinyXML patch for GCC < 4.2

OCIO Project Status

- **Known Bugs**

- **Major**

- Windows build compatibility -> 1.0.10
 - GPU vs CPU path
 - ICC profile generation
 - ACES highlight banding + hue shift
 - Drift in round-trip calculations

- **Minor**

- OCIO Display channel swizzling
 - Non-ASCII folders Windows
 - PyOpenColorIO - Baker segfault, Role unset
 - ...

OCIO Project Status

- Path towards OCIO v2.0?
 - Increase mathematical rigour
 - Account for necessities of modern workflows
 - ACES as a first rate citizen
 - No quality loss through GPU
 - Additional features?
 - ...

OCIO + Autodesk SynColor

- Autodesk assessing technical feasibility and community feedback
- **Doug Walker** - Project Lead
- Inherit SynColor functionality within an OCIO paradigm
- Backwards config compatible (*ocio_profile_version: 1*)
- Smooth API transition for clients
- API details forthcoming*

SynColor

- Autodesk's software component for color management
 - used in Maya, Flame, Lustre (and recently Arnold, Tweak RV, VRED, ...)
 - single API for access to OCIO, ICC, ACES, CLF, ASC CDL, ...
 - roughly 150k lines, actively developed
 - used in production since 2012
- Very fast and accurate processing engines (CPU & GPU)
 - has "op" model that is similar but more extensive than OCIO
- Similar notion of color space based conversion
 - comes with a large collection of transforms (ACES, etc.)

OCIO v2.0

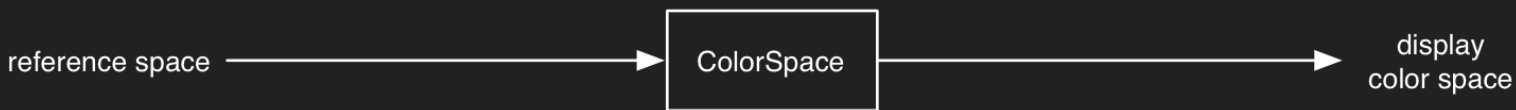
- Enhancements
 - Improved GPU renderer
 - Improved CPU renderer
 - Inversion of all transforms
 - Additional reference space
 - Rigorous ACES transforms
 - Academy/ASC Common LUT (CLF) Format & Autodesk Color Transform (CTF) Format
 - Support ICC monitor profiles
 - Built-in common color transforms
 - A friendly API for manipulating configs
 - Config color space interchange
 - Additional descriptive color space properties
 - Comprehensive unit-tests
 - Per-shot Looks

OCIO v2.0

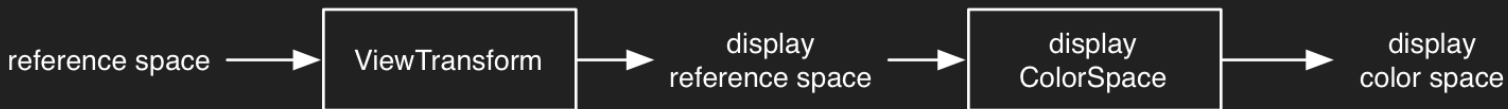
- Enhancements
 - Improved GPU renderer
 - Improved CPU renderer
 - Inversion of all transforms
 - **Additional reference space**
 - **Rigorous ACES transforms**
 - Academy/ASC Common LUT (CLF) Format & Autodesk Color Transform (CTF) Format
 - **Support ICC monitor profiles**
 - **Built-in common color transforms**
 - A friendly API for manipulating configs
 - **Config color space interchange**
 - Additional descriptive color space properties
 - Comprehensive unit-tests
 - Per-shot Looks

OCIO v2.0 - Additional Reference Space

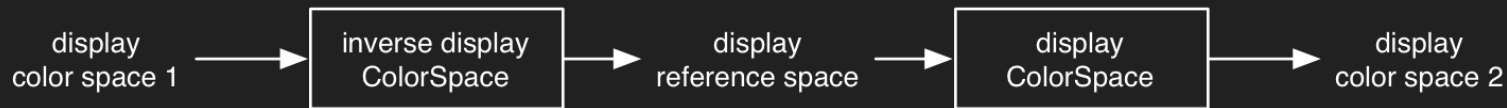
OCIO v1 currently does this
to convert to a display:



v2 would add the ability
to do this:



and this:



OCIO v2.0 - ICC Profile Support

- Ability to pull an OS ICC profile as the final display transform

```
displaycolorspaces:  
- !<ColorSpace>  
  name: CIE-XYZ-D65  
  # This is the implied display_reference.  
  
- !<ColorSpace>  
  name: ICCSystemProfile  
  from_display_reference: !<SystemMonitorTransform>
```

OCIO v2.0 - ACES

- Rigorous implementation of native ACES colorspace
- Native ACES Ops
 - Red Modifier
 - Glow
 - Surround
- RRT and ODT tone curves through half-domain 1D LUTs
- Supports Academy/ASC Common LUT Format (CLF)
 - ACES logo requirement

ACES BoF is Wed. 9:30-11:00, LACC room 406A

OCIO v2.0 - Built-In Colorspaces

- OCIO will provide API accessible common color transforms
- Accessible as a “Built-In” Transform
 - Can be stacked and reordered within a group transform

```
- !<ColorSpace>
  name: ACEScct
  isdata: false
  from_reference: !<BuiltInTransform> {name: ACES2065-1_to_ACEScct}
```


OCIO v2.0 - Additional Config Metadata

- Config interchange spaces (ACES2065-1, CIE XYZ)

roles:

```
aces_interchange: ACES - ACES2065-1
cie_xyz_d65_interchange: CIE-XYZ-D65
```

- Colorspace chromaticity definitions

```
- !<ColorSpace>
  name: ACES - ACES2065-1
  chromaticities: {0.734700, 0.265300, 0.000000, 1.000000, 0.000100, -0.077000,
0.321680, 0.337670}
```

Next Steps

- Continued discussion and settling on API implementation with OCIO Owners, Autodesk Engineers, and active contributors.
- Working group meeting
 - Wednesday 1-3pm @ J.W. Marriott, 3rd Floor, “Studio III”
- State of OCIO in the wild?
 - Public survey
 - Are studios using vanilla 1.0.9 or Master?
 - Do studios maintain their own fork?
 - If so what features have been added
 - Can they be made public
 - Impact on v2.0 API changes