



# Overview

# Antitrust Policy Notice

Linux Foundation meetings involve participation by industry competitors, and it is the intention of the Linux Foundation to conduct all of its activities in accordance with applicable antitrust and competition laws. It is therefore extremely important that attendees adhere to meeting agendas, and be aware of, and not participate in, any activities that are prohibited under applicable US state, federal or foreign antitrust and competition laws.

Examples of types of actions that are prohibited at Linux Foundation meetings and in connection with Linux Foundation activities are described in the Linux Foundation Antitrust Policy available at [www.linuxfoundation.org/antitrust-policy](http://www.linuxfoundation.org/antitrust-policy). If you have questions about these matters, please contact your company counsel, or if you are a member of the Linux Foundation, feel free to contact Andrew Updegrove of the firm of Gesmer Updegrove LLP, which provides legal counsel to the Linux Foundation.

/\* ACADEMY  
SOFTWARE  
FOUNDATION

[aswf.io](http://aswf.io)

# Why Open Source?

# Why Open Source?

- Software development has a **cost**
  - Development
  - Maintenance
  - Documentation
  - Training
- Open Source ecosystems **share** those costs
- Empower developers to lead development

# Open Source Projects



# Get the browser that protects what's important

No shady privacy policies or back door advertisers. Just a lightning fast browser that doesn't sell you out.

Download Firefox



moz://a

Firefox Browsers Products Who We Are Inspiration  
Firefox for Desktop

The collage includes:

- A screenshot of the Mozilla Firefox homepage with the slogan "Get the browser that protects what's important".
- A screenshot of the Blender.org website showing the "Blender 2.92 Release Candidate" news section.
- A screenshot of the WordPress.org homepage with the heading "Meet WordPress".
- A screenshot of the WordPress dashboard showing the theme library.

# Open Source: Innovation Accelerator

Standardization on open technologies

Neutral environment for collaboration & cross-pollination

Innovation multiplier

Enables better interoperability

Minimizes fragmentation

Qualifies reference architectures

Lowers barriers to enter a new domain

Enables new business opportunities

Leads to better products

Allows shared cost of development

# About the Academy Software Foundation

/\* ACADEMY  
SOFTWARE  
FOUNDATION

# Open Source in Entertainment

*How the Academy Software Foundation  
Creates Shared Value*

A report from



Written by  
Barbara Robertson

[report.aswf.io](http://report.aswf.io)

DUNE Image Courtesy of DNEG © 2021 Legendary  
Warner Bros. Entertainment Inc. All Rights Reserved.



# An Open Source Foundation Developed in Partnership



© AMPAS ®

The Academy Software Foundation provides a neutral forum for open source software developers in the motion picture and broader media industries to share resources and collaborate on technologies for image creation, visual effects, animation and sound.



# Why the Academy Software Foundation?



- Legal Framework
- Continuous Integration and Build Infrastructure
- Clear path to accepting contributions (neutral forum)
- Versionitis

# ASWF created

August 10, 2018

*Founding members:*

Animal Logic

Autodesk

Blue Sky Studios

Cisco

DNEG

DreamWorks

Animation

Epic Games

Foundry

Google Cloud

Intel

SideFX

The Walt Disney

Studios

Weta Digital



Scitech  
Council

Open source  
Investigation  
concludes

01

## First project

October 23, 2018

**OpenVDB**

*New members:*

Sony Pictures

Entertainment

Warner Bros.

Blender Foundation

Visual Effects Society

February 8, 2019

**OpenColorIO**

May 1, 2019

**OpenEXR**

**OpenCue**

NVIDIA

ftrack

Red Hat

02

03

04

## Open Source Day 2019

July 29, 2019

**OpenTimelineIO**

Netflix

Amazon Web Services

Rodeo FX

MovieLabs

Sept. 13, 2019

Apple

Microsoft

05

\$1M/  
year

COVID  
19

May

2018

## Open Source Days 2020

August 19-20, 2020

Unity Technologies

Conductor

Technologies

SMPTE

06

07

08

April 16, 2020

**Open**

**Shading**

**Language**

AMD

DockYard

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Dec. 15, 2020

Adobe ETC

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Jan. 28, 2022

Wevr

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## Open Source Forum 2022

March 10, 2022

Rez

DPEL

RawtoACES

## Open Source Days 2022

August 8-9, 2022

**OpenFX**

**OpenAssetIO**

**Open Review Initiative**

Canonical

Khronos Group

## Open Source Forum 2023

Feb. 16, 2023

HP  
Framestore

# Membership

## Premier



ACADEMY  
OF MOTION PICTURE  
ARTS AND SCIENCES



## General



CANONICAL



## Associate



ENTERTAINMENT  
TECHNOLOGY  
CENTER



# Governing Board



Rob Bredow  
ILM



Mike Ford  
Sony



Andy Maltz  
Science and  
Technology  
Council



Kimball Thurston  
Weta



Brady Woods  
Microsoft



Golriz Fanai  
AWS



Paul Salvini  
DNEG



Guy Martin  
NVIDIA



Eric Bourque  
Autodesk



Michael Johnson  
Apple



Darin Grant  
Animal Logic



Jim Jeffers  
Intel



Chris Hall  
AMD



Buzz Hays  
Google Cloud



Bruno Sargeant  
Unity Technologies



Colette Mullenhoff  
Science and  
Technology  
Council



Andrew Pearce  
DreamWorks



Bill Roberts  
Adobe



Sebastian Sylwan  
Netflix



Julie Truong  
Epic Games



David Morin  
Epic Games



John Mertic  
Linux Foundation



Emily Olin  
Linux Foundation



Yarille Kilborn  
Linux Foundation

# Staff

# TAC Representatives



Kimball Thurston  
Weta



Jonathan Stone  
Lucasfilm



Cary Phillips  
ILM



Christina Tempelaar-Lietz  
Epic Games



Sean Looper  
AWS



Cory Omand  
Pixar



Ken Museth  
NVIDIA



Christopher Kulla  
Epic Games



Michael Johnson  
Apple



Daniel Heckenberg  
Animal Logic



Mark Visser  
Unity Technologies



Brian Cipriano  
Google



Jean-François Panisset  
VES Technologies



Greg Denton  
Microsoft



Bill Ballew  
DreamWorks



Bill Roberts  
Adobe



Gordon Bradley  
Autodesk Inc.



Michael Dolan  
Epic Games



Joshua Minor  
Pixar



Eric Enderton  
NVIDIA



Sean McDuffee  
Intel



Larry Gritz  
Sony



Michael Min  
Netflix



Roy C Anthony  
DNEG



Sean O'Connell  
Advanced Micro Devices

# Behind the Screens



## Our Mission

Increase the *quality* and *quantity* of open source contributions by establishing a *governance model*, a *legal framework* and a *community infrastructure* that lowers the barrier to entry for developing and using open source software.

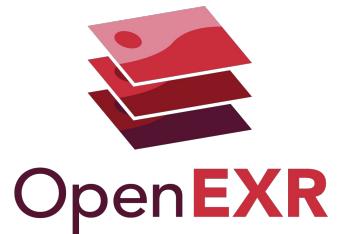
# Our Goals

- Provide a ***neutral forum*** to coordinate cross-project efforts, establish best practices and share resources.
- Develop an open ***continuous integration (CI)*** and build infrastructure to enable reference builds from the community.
- Streamline development for build and runtime environments through the sharing of ***open source build configurations, scripts and recipes***.
- Provide individuals and organizations with a ***clear path for participation*** and code contribution.
- Provide better, ***more consistent licensing*** through a shared licensing template.
- Create working groups for exploration of ***new or larger projects***.
- Focus on ***diversity and inclusion*** and raising the profile of software engineers in our industry.

# Our Projects



contributed by:  
Dreamworks  
Animation



contributed  
by:  
Lucasfilm



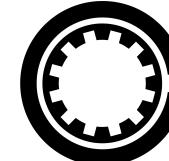
contributed by:  
Sony Pictures Imageworks



contributed by:  
Pixar Animation  
Studios



contributed by:  
Open Effects  
Association



contributed by:  
Google Cloud and  
Sony Pictures Imageworks



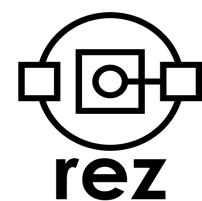
contributed by:  
Sony Pictures Imageworks



contributed by:  
Foundry



contributed by:  
The Academy of Motion  
Picture Arts and  
Sciences



contributed by:  
Allan Johns



created by:  
Academy Software  
Foundation



contributed by:  
Lucasfilm



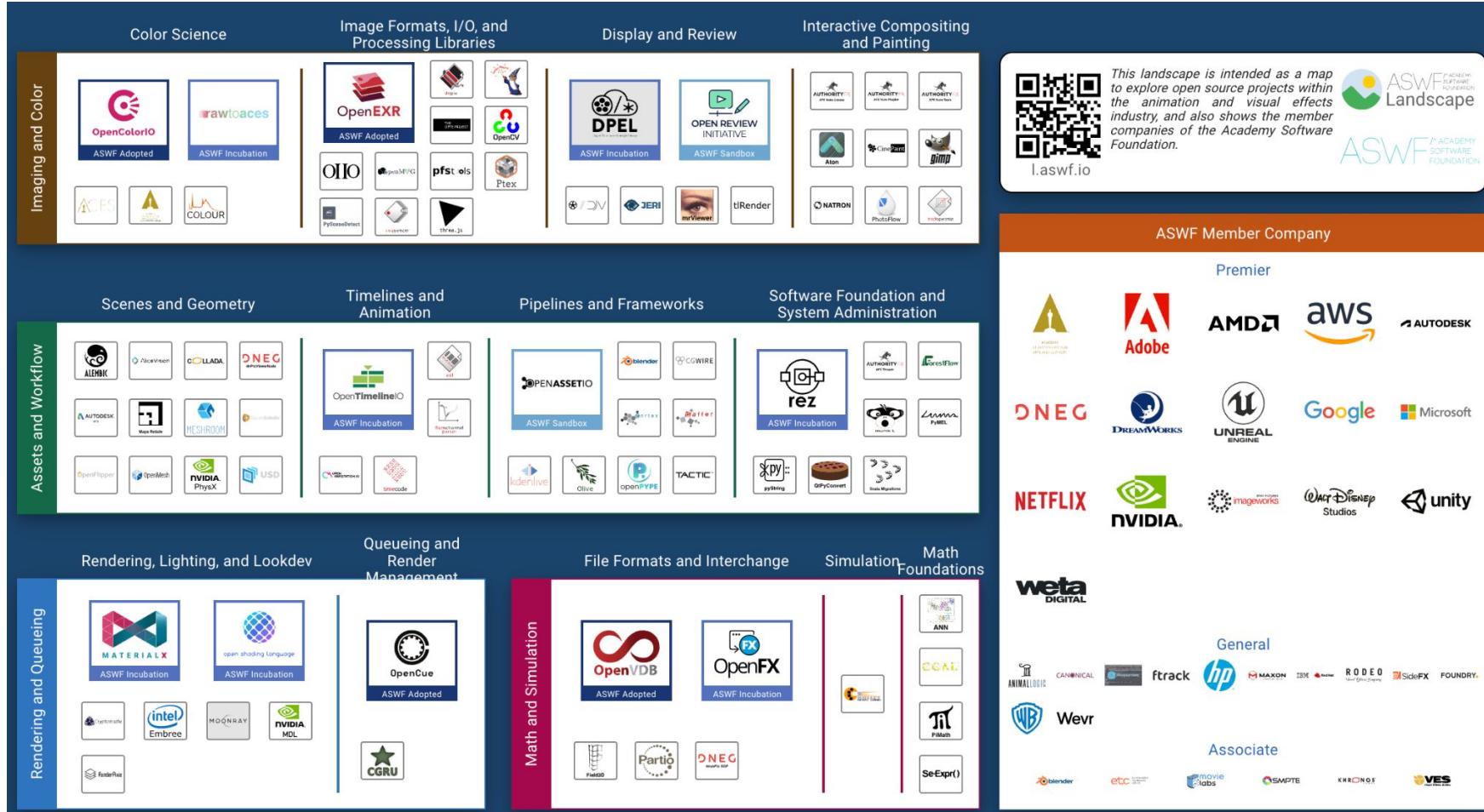
Digital Production Example Library  
created by:  
Academy Software  
Foundation

## Diversity & Inclusion Working Group

“Open source has the power to break down racial, gender, and corporate barriers to unite people around a shared goal...”

Read more at [aswf.io/diversity\\_inclusion](https://aswf.io/diversity_inclusion).

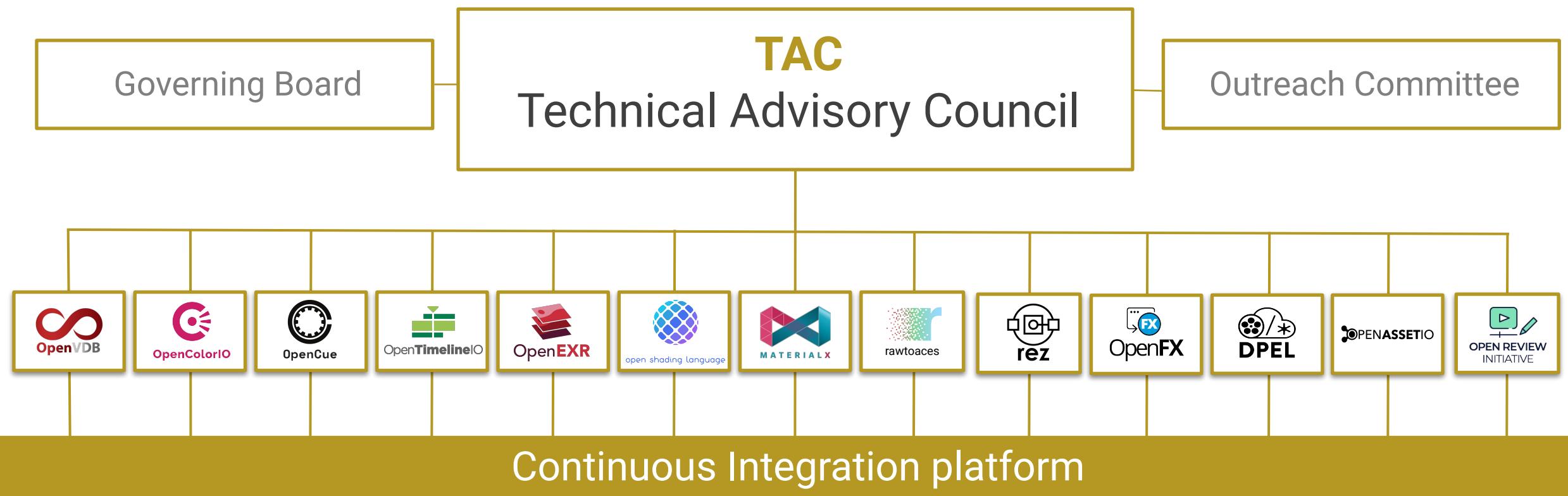
# ASWF Landscape



[l.aswf.io](http://l.aswf.io)

- Public list of open source projects in the animation and VFX industry
  - Updates can be submitted via GitHub
  - Goal is to have all active, open source projects in animation and VFX industries represented.

# Structure





*The Croods; courtesy of DreamWorks Animation*

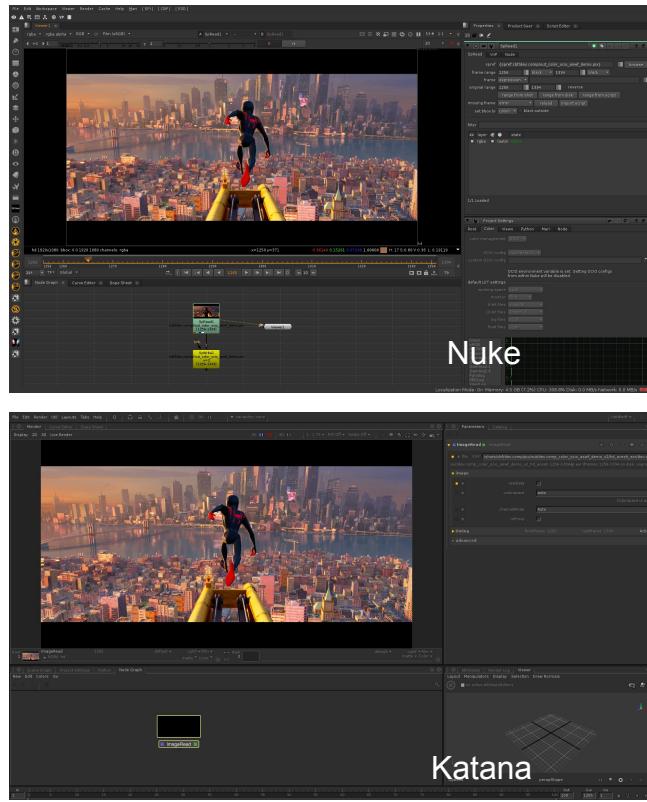


*How to Train Your Dragon: The Hidden World; courtesy of DreamWorks Animation*



[openvdb.org](http://openvdb.org)

- First project adopted by ASWF in Sept. 2018; first project to graduate to adopted status in July 2019.
- Developed by DreamWorks Animation in 2012.
- C++ library for volumetric representations including fluid simulations, animated volumes and environmental effects.
- Academy Technical Achievement Award recipient.
- Key contributors include DreamWorks, Autodesk, DNEG, Industrial Light & Magic, NVIDIA, SideFX, Weta Digital.



# OpenColorIO

[opencolorio.org](http://opencolorio.org)

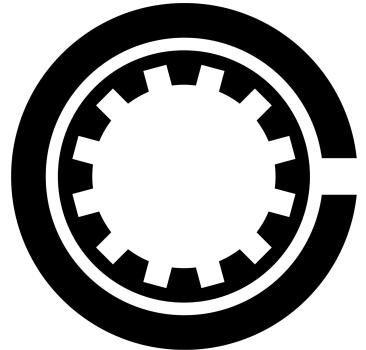


Spider-Man™: Into the Spider-Verse; all images courtesy of Imageworks

- Joined ASWF in Feb. 2019; adopted status in Nov. 2019.
- Developed by Sony Pictures Imageworks in 2003.
- Provides a consistent user experience across digital content creation applications; widely adopted in VFX and computer animation studios and software.
- Academy Technical Achievement Award recipient.
- Key contributors include Imageworks, Autodesk, DNEG, ILM, Foundry, Framestore.
- OCIO v2 released fall 2020, led by Autodesk.

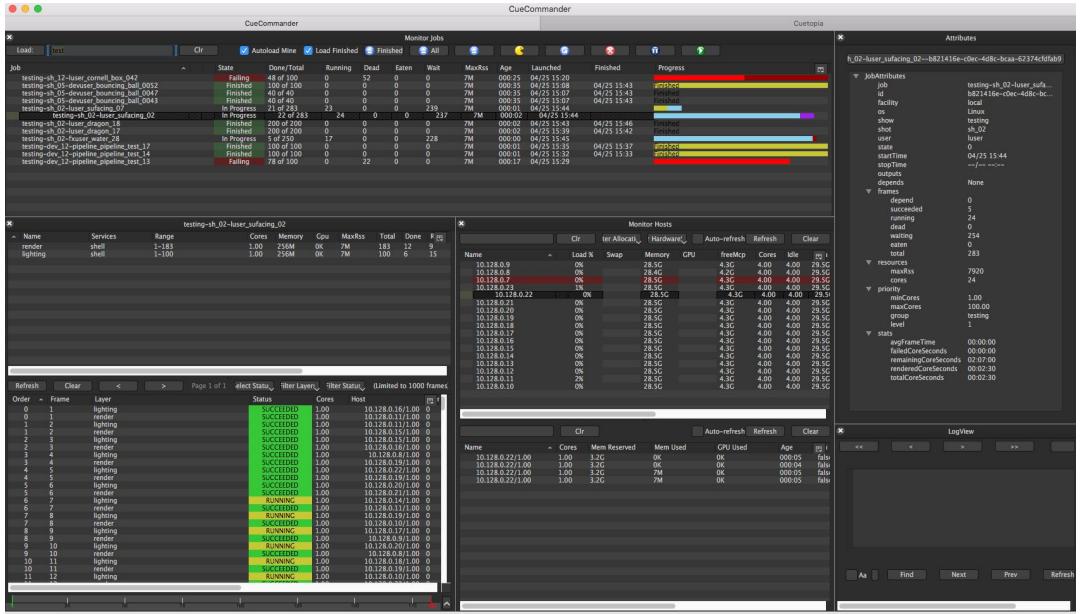


Smurfs: The Lost Village; courtesy of Sony Pictures Imageworks



# OpenCue

[opencue.io](http://opencue.io)

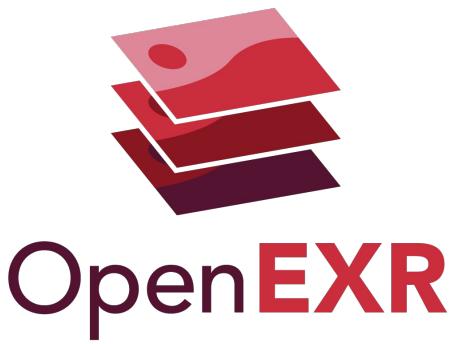


OpenCue screenshot

- Joined ASWF in April 2019.
- Developed at Sony Pictures Imageworks as its internal render farm manager (“Cue3”); collaboration with Google Cloud to release as OpenCue in January 2019.
- Fully featured render manager for media and entertainment that can be used to break down complex jobs into individual tasks.
- Contributors include Imageworks, Google, Netflix, Microsoft, Amazon.
- Monthly releases over the past year, including adding Python 3 compatibility, Windows support, new documentation.



Images from *Solo: A Star Wars Story*. © and TM Lucasfilm Ltd. All Rights Reserved.



[openexr.org](http://openexr.org)

- Joined ASWF in April 2019; adopted status in Nov. 2019.
- Developed by ILM in 1999; first release of a major open source project by a studio.
- High dynamic-range (HDR) image file format for high-quality image processing and storage; widely adopted standard in computer graphics.
- Academy Technical Achievement Award recipient.
- Key contributors include ILM, Disney Animation, Imageworks, Epic Games, Weta Digital, Pixar, Autodesk, and DreamWorks.
- OpenEXR 3.0 just released.



Image courtesy of Pixar Animation Studios.

OpenTimelineIO used on Coco  
for transitions and linking  
media to the latest renders.



# OpenTimelineIO

[opentimeline.io](http://opentimeline.io)

- Joined ASWF in July 2019.
- Developed by Pixar Animation Studios.
- Open source interchange format for editorial timeline information – clips, timing, tracks, transitions, metadata etc.
- Key contributors include Pixar, Netflix, DreamWorks, Autodesk.
- In Public Beta



*The Angry Birds Movie 2*; courtesy of Imageworks



*Spider-Man: Far From Home*; courtesy of Imageworks



open shading language

[openshadinglanguage.org](http://openshadinglanguage.org)

- Joined ASWF in April 2020.
- Developed by Sony Pictures Imageworks; released as open source in 2010.
- De facto standard shading language for VFX and animation, ideal for describing materials, lights, displacement, and pattern generation.
- Academy Technical Achievement Award recipient.
- Key contributors include Imageworks, Animal Logic, NVIDIA, Pixar, DNEG, Autodesk.

ILM Production tests using MaterialX



ILM UNIFIED

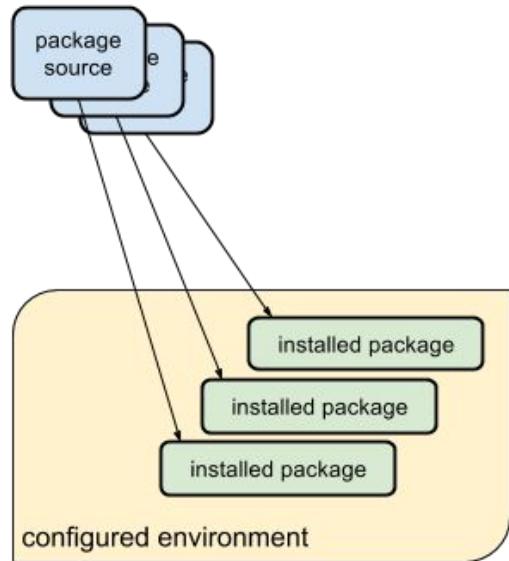


STANDARD SURFACE

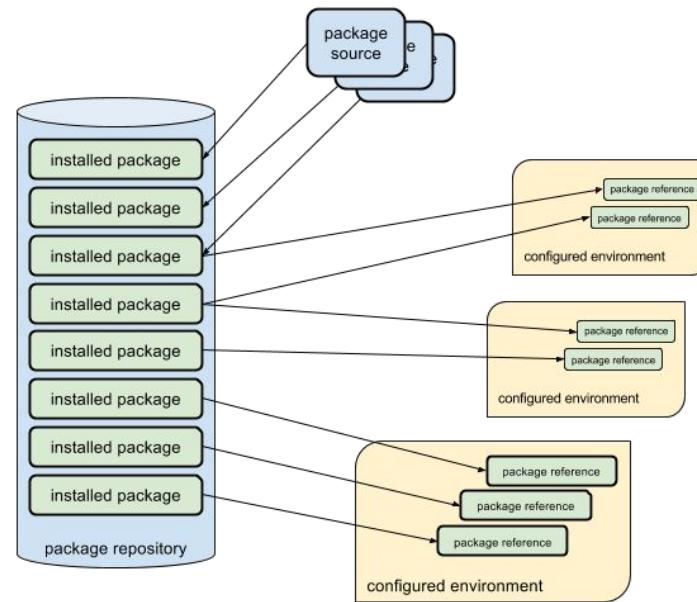


[materialx.org](https://materialx.org)

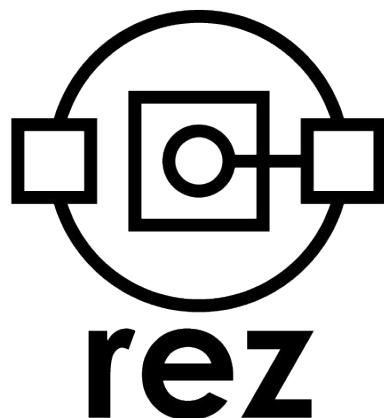
- Joined ASWF in March 2021.
- Open standard for representing rich material and look-development content in computer graphics, enabling its platform-independent description and exchange across applications and renderers.
- Launched at Industrial Light & Magic in 2012, MaterialX has been a key technology in their feature films and real-time experiences since Star Wars: The Force Awakens and Millennium Falcon: Smugglers Run.
- Key contributors include Sony Pictures Imageworks, Pixar, Autodesk, Adobe, and SideFX.



Typical package managers  
install packages into an  
environment

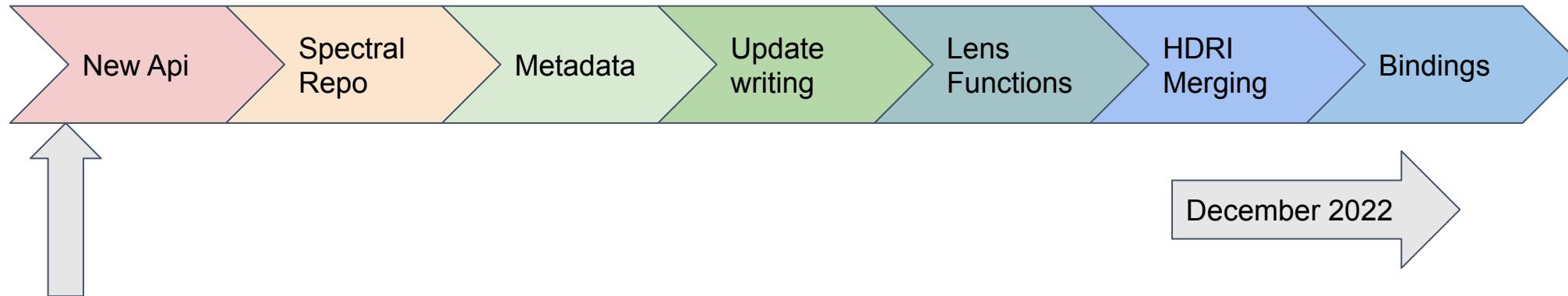


Rez installs packages once,  
and configures environments  
dynamically



[rez-project.io](https://rez-project.io)

- Joined ASWF in February 2022.
- Developed by Allan Johns of Method Studios.
- Cross-platform package manager that leverages a central repository for storing packages instead of installing into each environment separately, reducing the time to create complex environments to just a few seconds.
- Key contributors include Luma Pictures, Method Studios, NVIDIA, and Shotgrid



# rawtoaces

[rawtoaces.org](http://rawtoaces.org)

- Joined ASWF in January 2021.
- Software package that converts digital camera raw files to ACES container files containing image data encoded according to the Academy Color Encoding Specification (ACES) as specified in SMPTE 2065-1.
- Key contributors include AMPAS and Weta Digital



OpenFX Overlay Draw Suite

Industry-wide common interface between image-based visual effects plugins and host applications, used by *Autodesk Flame*, *Foundry Nuke*, *Blackmagic Design DaVinci Resolve* and *Fusion*, *Sony Catalyst* and *MAGIX Vegas Pro*, *Assimilate Scratch*, *Filmlight Baselight*, *Boris FX Sapphire* and *Silhouette*, *RE:Vision Effects* and more.

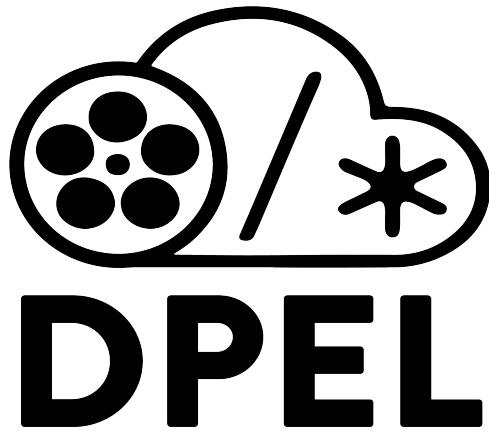
Open, extensible C API currently version 1.4 with version 1.5 in development. Want to find out more or contribute?

OpenFX

[openeffects.org](http://openeffects.org)



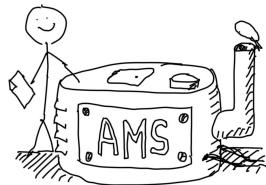
Launching with ASC Standard Evaluation Material II (StEM2), Animal Logic's ALab Phase 2, Intel's Volumetric Clouds Library and AWS character Noa.



Digital Production Example Library

[dpel.aswf.io](http://dpel.aswf.io)

Providing a vendor-neutral hosting platform and a uniform license agreement, to encourage, curate and publish *production-grade sample assets* for developers, researchers and educators, Digital Production Example Library is the conclusion of an Academy Software Foundation working group on assets



ftrack



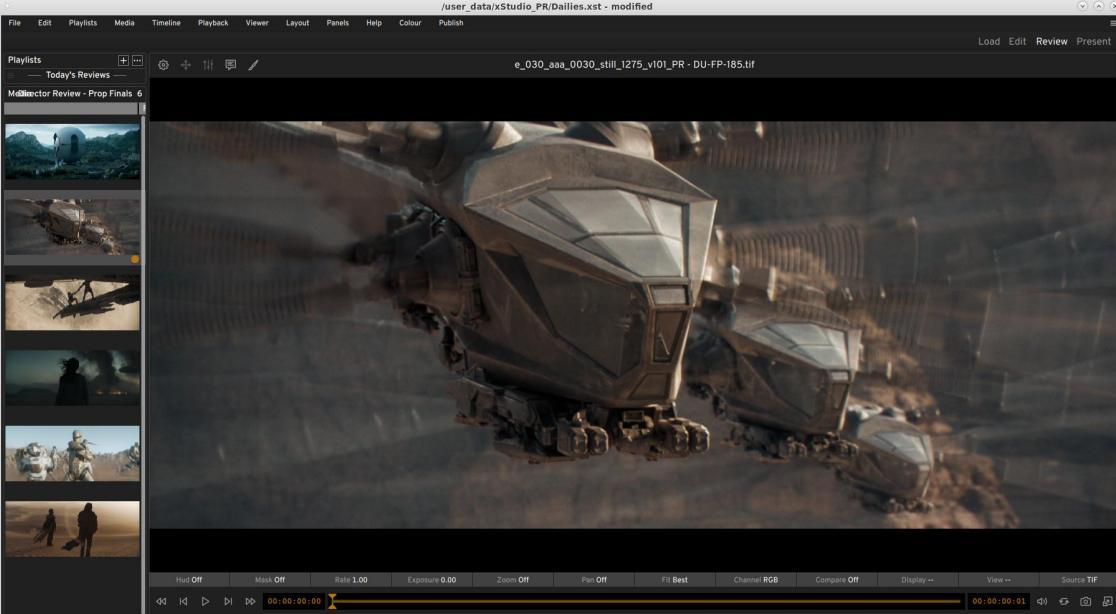
# OPENASSETIO

[openassetio.org](http://openassetio.org)



OpenAssetIO is an early stage open source interoperability standard between tools and asset management systems, *developed by Foundry* with proofs of concept and design input from 15 companies including *DNEG, Pixar, Amazon Web Services, Animal Logic, Blizzard, and Blender.*

OpenAssetIO was the first project to join the Academy Software Foundation in sandbox stage.



DNEG's xSTUDIO



[openreviewinitiative.org](http://openreviewinitiative.org)



Autodesk's RV Player

A new open source project with the mission to build a unified toolset for *playback, review and approval* of motion picture and related professional media, with *Autodesk contributing RV, Dneg contributing xSTUDIO, Imageworks contributing parts of itView*, and the three companies providing lead architects and maintainers for the project Technical Steering Committee.

# Working Groups

- CI
- Diversity and Inclusion
- Rust
- USD

# How to contribute

## Contribute to an existing project:

- Submit a PR with a bugfix or new feature
- Pick existing GitHub issue as a sample project
- Integrate with a new app / contribute plugin
- Help improve project documentation
- Submit additional test cases
- Join the TSC discussion: dev mailing list, conf calls

## Get involved with the TAC or Working Group:

- DevOps / CI expertise always useful
- Interest / expertise in security especially welcome
- Join the TAC discussions: mailing list, conf calls, working groups

More information at [tac.aswf.io/engagement](https://tac.aswf.io/engagement)

 Search Academy Software Foundation

[Need help or have a question? Contact us here](#)

## Getting Involved in Projects

All of the projects hosted at the Academy Software Foundation are open and transparent, and welcome participation from anyone interested in the technology areas. Each project publishes their governance processes within their project repo ( typically in the README.md file or in a GOVERNANCE.md file within the primary project repo or TSC repo ) on roles within the community and how decision making is made.

## TAC Meetings

Learn more about joining the public meetings of the Technical Advisory Council (TAC) on [the Meetings page](#)

## Mailing Lists and Slack channels for hosted projects

Each project hosted at the Academy Software Foundation collaborates on open channels that are welcome for anyone in the community to participate in. See the below list of channels for each project.

All Slack channels referenced below are part of the [Academy Software Foundation Slack organization](#) unless otherwise noted.



Website: <https://opencolorio.org/>  
Dev Mailing List: <https://lists.aswf.io/g/ocio-dev>  
User Mailing List: <https://lists.aswf.io/g/ocio-user>  
Slack: [slack.opencolorio.org](https://slack.opencolorio.org)  
Leads: Carol Payne - Imaging Technologist at Netflix, Inc



Website: <https://www.openexr.org/>

## Join the Discussion

Mailing Lists for ASWF projects: [lists.aswf.io](https://lists.aswf.io)

Join as a member: [aswf.io/join](https://aswf.io/join)

Slack: [slack.aswf.io](https://slack.aswf.io)

Github: [github.com/AcademySoftwareFoundation](https://github.com/AcademySoftwareFoundation)

Behind the Screens: [bit.ly/BehindtheScreens](https://bit.ly/BehindtheScreens)

Twitter: [@AcademySWF](https://twitter.com/@AcademySWF), [#ASWF](#)

YouTube: [AcademySoftwareFoundation](https://www.youtube.com/user/AcademySoftwareFoundation)

## How to participate

Developers can join our mailing lists to stay informed about the code and our projects at [lists.aswf.io](https://lists.aswf.io).

Learn how your organization can support the Academy Software Foundation community at [aswf.io/join](https://aswf.io/join).

Stay connected to us on Twitter at  
[@AcademySWF](https://twitter.com/AcademySWF) and [#ASWF](https://twitter.com)

# THANK YOU!