



\ ACADEMY COLOR ENCODING SYSTEM \

ACES Architecture TAC Meeting

July 15, 2020

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Agenda

- Welcome - Agenda - Expected Outcomes (5 mins)
- Discussion of the role of the TACs (20 mins)
- Short review of the ACES 1.2 release (5 mins)
- The road to ACES 2.0 (45 mins)
 - On-going working group progress
 - New working groups / working group proposals
- TAC discussion of ACES priorities, process, strategy (15 mins)

Expected Outcomes

- TAC members...
 - have robust discussion on the role of the Technical Advisory Councils in the development of ACES.
 - are provided a recap of the ACES 1.2 release and high level plans for ACES 2.0.
 - receive an update on the status of on-going architecture working groups.
 - are presented the proposals for new architecture working groups.
 - provide feedback on the overall direction of the ACES project and working group alignment with the projects goals.
 - take action to review and provide feedback on updated ACES Logo Program documents

Discussion – Role of the TACs

- TAC members are key ACES stakeholders, industry experts and thought leaders.
- We need your guidance in making sure we're addressing the industry's needs.
- Champions ... TAC members should be champions for standards-based workflows and help us make sure ACES is fulfilling its promise.
- Engagement ... TAC members are encouraged to dig into the details, join working groups, test proposed and final solutions within their organizations, discuss with the ACES and wider motion-picture, television and gaming community.
- Ask the hard questions!

Review – ACES 1.2 Release

- ACES 1.2 released April 1, 2020
- Key new features
 - New version of Common LUT Format (CLF)
 - ACES Metadata File (AMF) to replace ACESclip
 - Other minor improvements
- Most community driven ACES release to date.
 - Created using new ACES project governance structure. 2 release candidates. Significant community input through virtual working groups.
- Excellent post-release community uptake (e.g. ACES 1.2 webinar, early integration into products, etc)
- ACES Logo Program documents are being updated to reflect the new release. Please review the draft documents when released and provide feedback to ACES Leadership.

The Road to ACES 2.0

- High level goal of ACES 2.0 is to "delight" the industry
- Priorities on community feedback on ACES 1.0. What works? What doesn't?
- Current top priorities for ACES 2.0
 - New, more "neutral", output transforms (RRT+ODT) based on parametric transforms introduced in ACES 1.1
 - Robust gamut mapping
 - Validation tools for CLF and AMF
 - Better reference implementations, documentation, and best practices
 - Revisiting film ... tools, test materials, input transforms
- Considering staged approach ... e.g. ACES 2.0, 2.1, 2.2 ... roll features out as they are ready.
- Example – ACES 2.0 with new Output Transforms and Gamut mapping, ACES 2.1 with new film transforms, etc.

On-going Working Group Progress

- 1 active architecture working group
 - Gamut mapping working group
 - Chairs: Carol Payne, Netflix & Matthias Scharfenberg, ILM
 - Group Start Date – 12/13/2019

Gamut Mapping ... the problem









Ongoing Working Groups – Gamut Mapping

- Exposure invariance – $f(a \cdot \text{RGB}) = a \cdot f(\text{RGB})$
- Source gamut agnosticism
- Monotonicity
- Simplicity – ideally suited to a fast shader implementation
- Invertibility
- Colors in a “zone of trust” should be left unaltered

Gamut Mapping Stages:

- IDT
- Scene-referred
- Display-referred

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Gamut Mapping Stages:

- IDT
- Scene-referred ← We are here!
- Display-referred

the results

















Ongoing Working Groups – Gamut Mapping

- Remaining Work Items
 - decisions on default values for compression functions & threshold
 - decisions around invertibility
 - and LOTS of testing.

New Working Groups

- 2 new architecture working groups
 - Output Transforms working group
 - Chairs – Kevin Wheatley, Framestore & Alex Fry, Animal Logic
 - Group Start Date – TBD
 - transformID working group (proposal stage)
 - Chair – TBD
 - Group Start Date – TBD

New Working Groups – Output Transforms

- 5+ years of feedback on ACES 1.0 - lots of known issues (invertibility, artifacts, complexity, lack of support for custom outputs, inconsistencies between existing ODTs, output clipping, etc.)
- Process of work
 - Establish agreement on requirements and issues
 - Define tasks that will lead to solutions to issues and fulfill requirements
 - Testing - objective (unit tests, etc.) and subjective testing with practiced methodology - engage colorists, VFX, etc.
 - Openness and accessibility to proposed algorithms is important; as is documenting development efforts
- Deliverables:
 - New, simpler algorithm that addresses known issues - revised reference code and unit tests
 - Documentation: reports on design choices and any experiments, the options and how to use

New Working Groups – transformID

- Proposal still in revision
- TransformID is a human parsable unique identifier for ACES transforms devised during the ACES 1.0 development process. Allows transforms to be identified regardless of implementation format (CTL, C++, LUTs, etc.)
- ACES Metadata File (AMF) implementation group has turned up various inconsistencies in transformID structure across transform types and shortcomings for production (e.g. LMT version tracking). Some attempts to revise in ACES 1.2 including adding a URN with a transformID version number.
- What is the best way to track custom / per-show / per-shot ACES transforms with a human parsable unique identifier?
- Can we create a toolset to help with tracking and validation of transformIDs?

TAC discussion of ACES priorities, process, strategy

- Example discussion topics
 - Are we missing anything big? What working groups do we not have, but need?
 - From your perspective, does the new ACES development process seem to be working?
 - How can you help us better advance implementation and adoption?
 - Would you rather see multiple ACES 2.x releases, or one big release?
 - How can we amplify our message and use of the online community (ACESCentral.com)?

Thank you for your participation

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