Digital Photography Working Group

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Chiba University

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Digital Photography WG Charter

• The mission of the DPWG is to enable and promote correct and effective use of ICC color management among digital photography users by:
  — Identifying digital photography user problems and needs regarding color management.
  — Preparing white papers and other educational materials, and promoting activities to guide developers and users in the appropriate application of ICC color management to digital photography.
  — Identifying limitations of ICC color management with respect to digital photography use cases, and developing recommendations to the digital photography community to address these limitations.
  — When necessary, proposing changes to the ICC profile format to address digital photography issues.
Why use ICC for DP?

• **The standard color encodings used in digital photography are evolving**
  — Different color encodings have different advantages and disadvantages for different end uses
    — reference media, precision, utility, etc.
  — New color encodings are developed to meet real or perceived needs

• **Users employ different media, and have different requirements for device color management**
  — Printer manufacturers cannot create color maps for every possible combination of ink, paper and illumination
  — Different users have different accuracy requirements
    — It is not practical to require that all devices satisfy the most rigorous accuracy and repeatability requirements
    - users with less critical needs do not want to pay the costs

• **Different users have different color reproduction objectives**
  — There needs to be some opportunity for customization
Why use ICC for DP?

• ICC profiles support arbitrary color encodings, making new encodings interoperable and backwards-compatible
  — both standard and device-specific color encodings
• Manufacturers, third-party vendors and users can create ICC profiles to meet their specific needs
  — for both accuracy and customization
• ICC profiles can be used to communicate user intents
  — intended color rendering when applied to camera RGB or scene-referred
  — print-referred color re-rendering for display-referred encodings
  — output intent in PDF/X
• ICC v4 provides a standard architecture that simplifies color management in complex systems
  — enables unambiguous end-to-end color communication while maintaining workflow flexibility
  — any number of source and destination encodings are supported
  — built-in preview and proofing
DPWG History

• Began by hosting visits and presentations by practicing photographers and digital photography experts
  — Lyon, France summer 2005
  — Scottsdale, USA fall 2005
  — Tokyo, Japan winter 2006

• Noted many misunderstandings; requests from photographers for quality information and improved ICC support for digital photography applications
  — Ongoing dialog
  — Prepared two white papers on digital photography
  — ICC experts participate in panel discussions
  — Example camera raw and scene-referred ICC profiles created
Example profiles for camera raw and scene-referred images

- Demo
ICC specification amendments

**Colorimetric Intent Image State tag**

— Previous ambiguities with the colorimetric and perceptual rendering intents have been resolved by the v4 revision and the PRMG amendment
  
  — The v4 perceptual intent PCS colorimetry is always output-referred to the PRM

— For the colorimetric rendering intents, it is generally assumed that the PCS colorimetry has previously been color rendered, but this is not required

— Some application areas require the ability to communicate the original scene colorimetry or appearance

— The ICC has added a new optional tag to the specification which allows the image state of the PCS colorimetry produced using the colorimetric rendering intents to be specified
Colorimetric Intent Image State tag

• The CIIS amendment adds an Image State tag to the specification with the following signatures:
  — scene colorimetry estimate, 'scoe'
  — scene appearance estimate, 'sape'
  — focal plane colorimetry estimate, 'fpce'
  — reflection hardcopy original colorimetry, ‘rhoc’
  — reflection print output colorimetry, ‘rpoc’

• New image state signatures can be added as desired

• This tag allows a user or application to correctly interpret the PCS colorimetry produced by the colorimetric rendering intents
Current DPWG topics

— Document DP use cases and essential tags for ICC profiles
— Recommend exchange color encoding for PRM colorimetry
— Develop PRM working space and gamut warning capabilities
— Investigate baseline scene analysis and scene-to-picture color rendering issues and recommendations
— Determine how to achieve easy use of different media & ICC color management by 'consumer' digital photographers
— Develop methods for communication of scene enhancements and media independent artistic considerations for deferred color rendering
— Address information gaps between advanced users, camera manufacturers, and color management experts
— Investigate the state of consensus on a camera color analysis gamut definition
Thank you for your time

If you are interested in joining the ICC or the DPWG please contact me at jack.holm@hp.com, or the ICC secretary ksmythe@npes.org
Why get involved?

• **Prime source for ICC information**
  — Get answers to ICC questions
  — Raise ICC problems
  — Stimulating discussions with ICC experts
  — Feedback from ICC users
  — Exposure to other ICC application areas
  — Drive the state of the art of color management

• **Improve interoperability with other ICC vendors**

• **Leverage cross-company investment in common objectives**

• **Continuous identification of opportunities for improving customer experiences**

• **Travel to exotic locations and have nice dinners**