Digital Photography Working Group

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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**