Pre-TC meeting
Consistent[1] Colour Appearance

W Craig Revie (GB) and Yasuki Yamauchi (JP)

San Diego, 8th November 2016

[1]Also called 'Common Colour Appearance'

Summary

- General problem statement (R8-13 Common Colour Appearance)
- Informal 'Focus Group' on LinkedIn
- Focus for the proposed CIE Technical Committee
- Planned research projects
- Discussion

General problem statement
R8-13 Common Colour Appearance

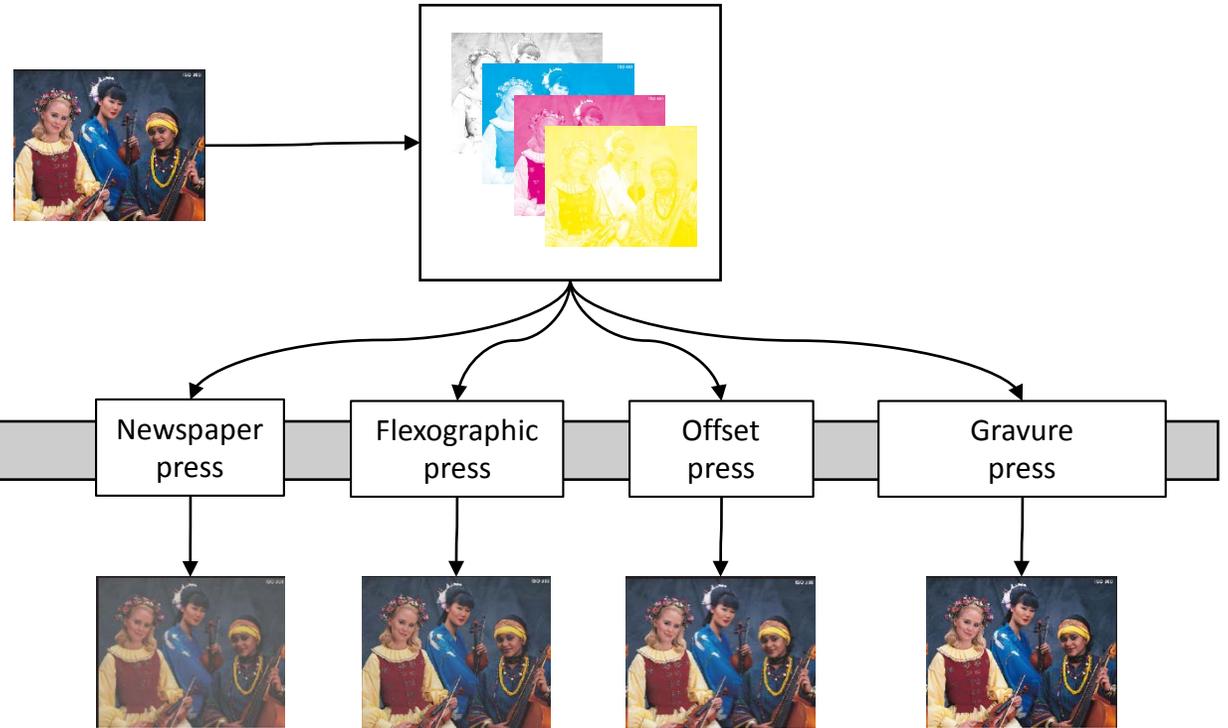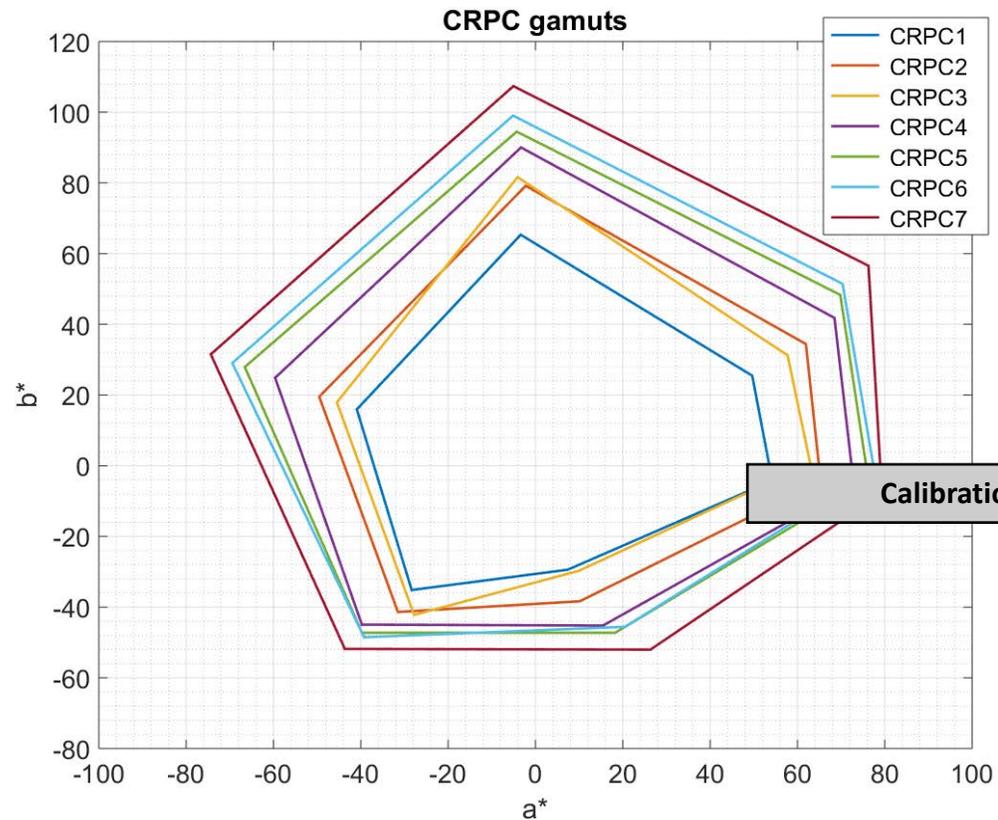**Question 1:** why do images in set B have a similar appearance whereas the images in set A do not?

Question 2: Is the degree of similarity of a set of images something that could be measured?

Why would such a metric be useful?

Characterised Reference Printing Conditions (ISO/PAS 15339)

Consistent colour appearance?

Flexible print (RGB) workflow

Print contract is agreed based on a **reference display image** or **prototype print** from a standard digital printing system
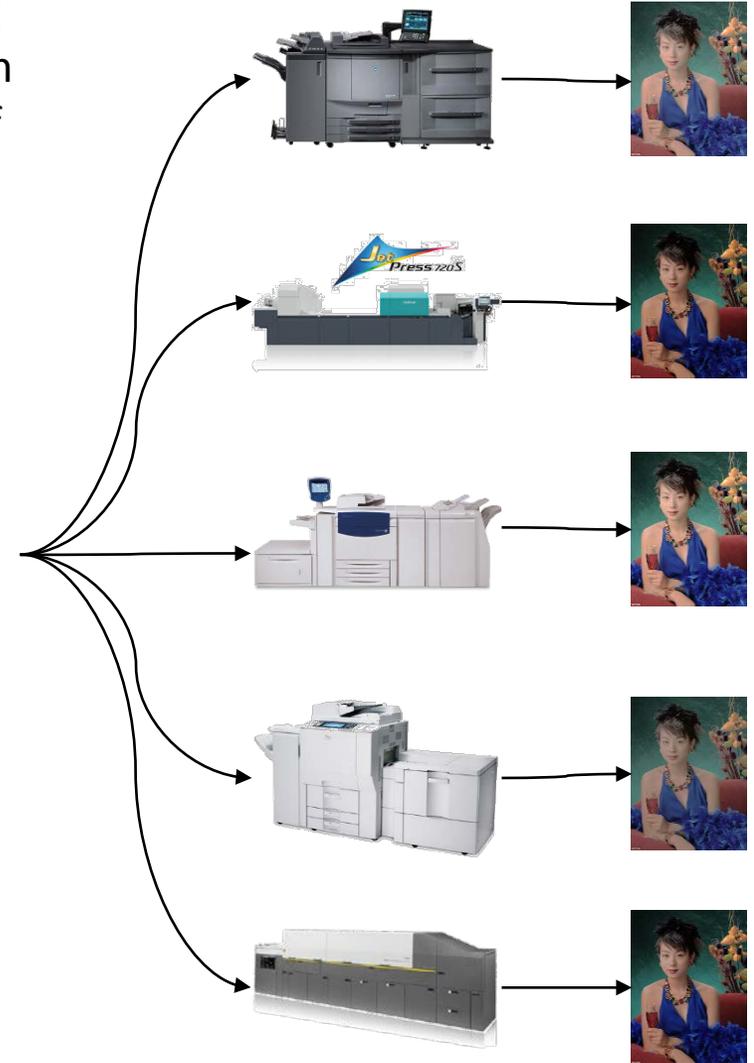

RGB

Printing should use all of the available printing gamut but must retain colour appearance of agreed reference

RGB

Colour conversion

Consistent colour appearance?

Brand management

Product packaging
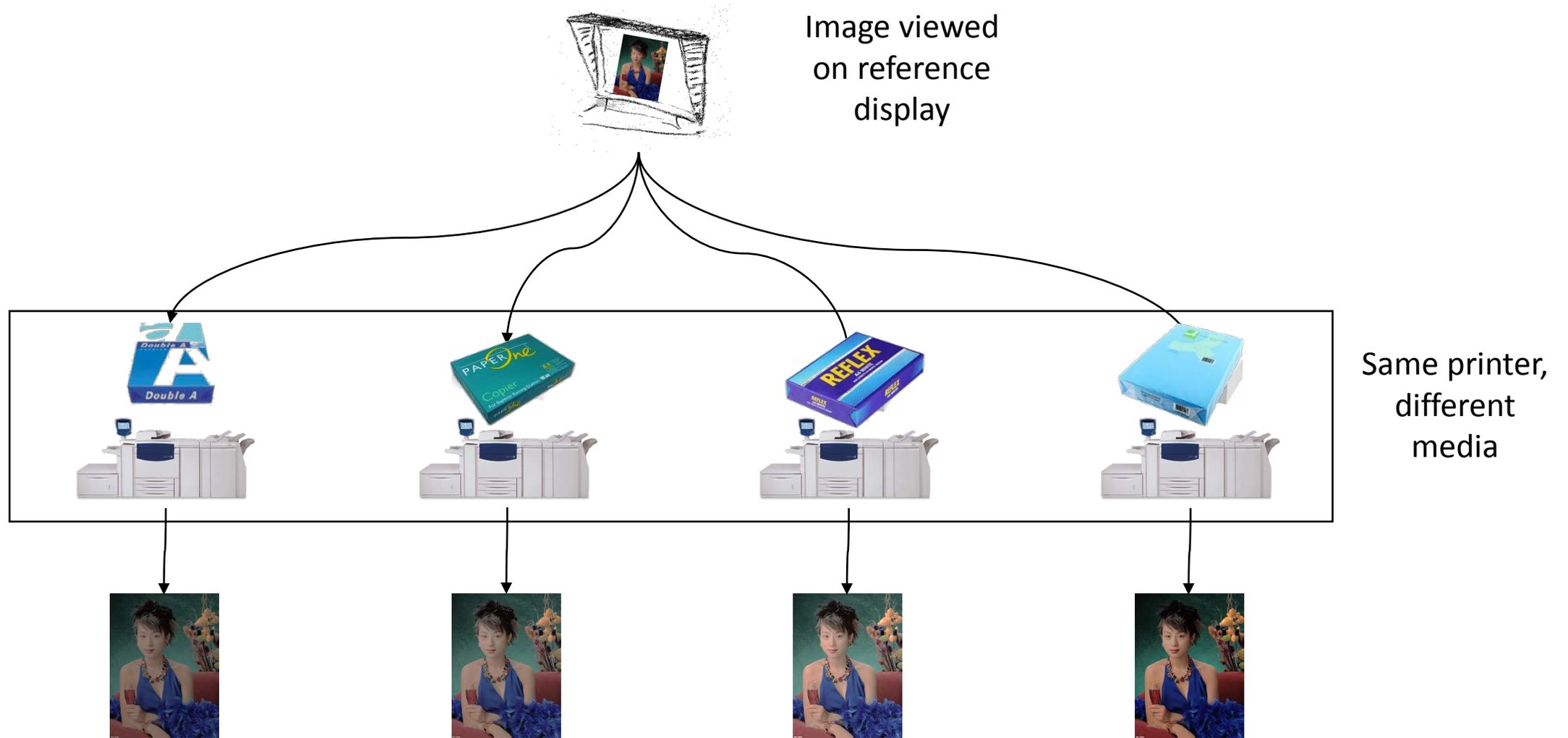

Magazine advert

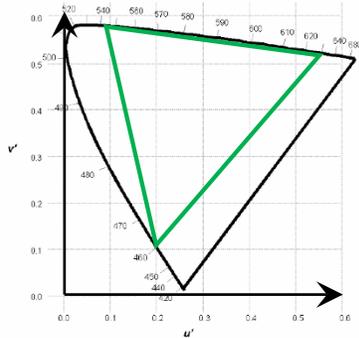Newspaper advert

Billboard advert

Vehicle wrap

Television / internet

Images copyright GMG and used with permission

Consistency across different print media

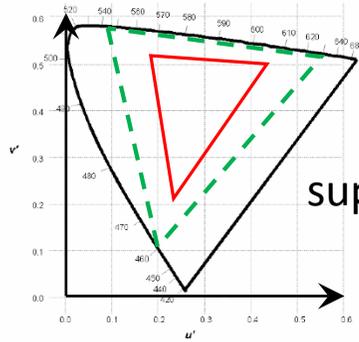Image viewed on reference display

Same printer, different media

Consistent colour appearance between prints and with display image?
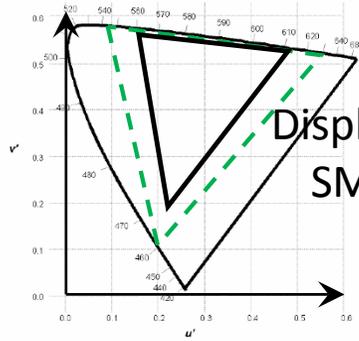
Consistency across displays (UHDTV)

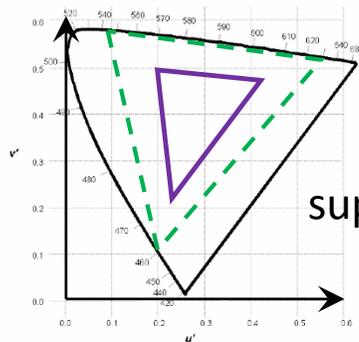Transmitter uses BT.2020 encoding with very large colour gamut

What is needed to achieve consistent colour appearance?

Display A supports BT.709

Display B supports SMPTE DCI-P3

Display C supports sRGB

R8-13 Common Colour Appearance Focus Group on LinkedIn

https://www.linkedin.com/groups/
CIE-R8-13-Common-Colour-8349689/about

http://www.color.org/resources/commonappearance.xalter

Focus group members

Chris Smyth	CA		Po-Chieh Hung	JP		Jack Holm	US
Claas Bickeboeller	CH		Yasuki Yamauchi	JP		John Seymour	US
Changjun Li	CN		Yasunari Kishimoto	JP		Ken Elsman	US
Muhammad Safdar	CN		Dr Choon-Woo Kim	KO		Mike Rodriguez	US
Yuan Jiang Ping	CN		Peter Nussbaum	NO		Raymond Cheydleur	US
Andy Kraushaar	DE		Phil Green	NO		Rebecca Gilden	US
Dennis Couzin	DE		Chris Bai	TW		Robert Chung	US
Dietmar Fuchs	DE		Craig Revie	UK		Steve Bonoff	US
Jan de Mayer	DE		Gregory High	UK		Veronika Lovell	US
Jürgen Seitz	DE		Jan Morovic	UK			
Klaus Richter	DE		Paul Sherfield	UK			
Michael Gall	DE		Ronnier Luo	UK			
Nikolaus Pfeiffer	DE		Sean Hillman	UK			
Philipp Tröster	DE		Tushar Chauhan	UK			
Christine Fernandez-Maloigne	FR		Abhijit Sarkar	US			
Yann Neymarc	FR		David McDowell	US			
Akihiro Ito	JP		David Steinhardt	US			
Hirokazu Kondo	JP		Donald Schroeder	US			
Kenji Kagitani	JP		Elena A. Fedorovskaya	US			
Makoto Matsuki	JP		Gerry Gerlach	US			

Proposed scope for
CIE Technical Committee

Objective: printed images

Reference Images

Production Printers
Includes media, inks and printer configuration

Reference Printer
Includes media, inks and printer configuration
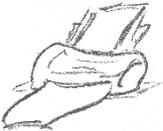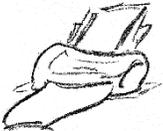
Production Prints

Reference Prints

Print Visual Assessment

Print Viewing Environment

Print measurement and assessment

Consistent Colour Appearance Metric

Use of print gamuts (hard copy)

Each set of images is rendered using the same algorithm

Image colorimetry defined by ISO 12640

Rendering algorithm → Reference print gamut → ICC Absolute colorimetric

Rendering algorithm → Print Gamut 1 → ICC Absolute colorimetric

Rendering algorithm → Print Gamut 2 → ICC Absolute colorimetric

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Rendering algorithm → Print Gamut n → ICC Absolute colorimetric

Proofing substrate suitable for accurate proofing all print gamuts as required by ISO 12647-7

Use of print gamuts (soft copy)
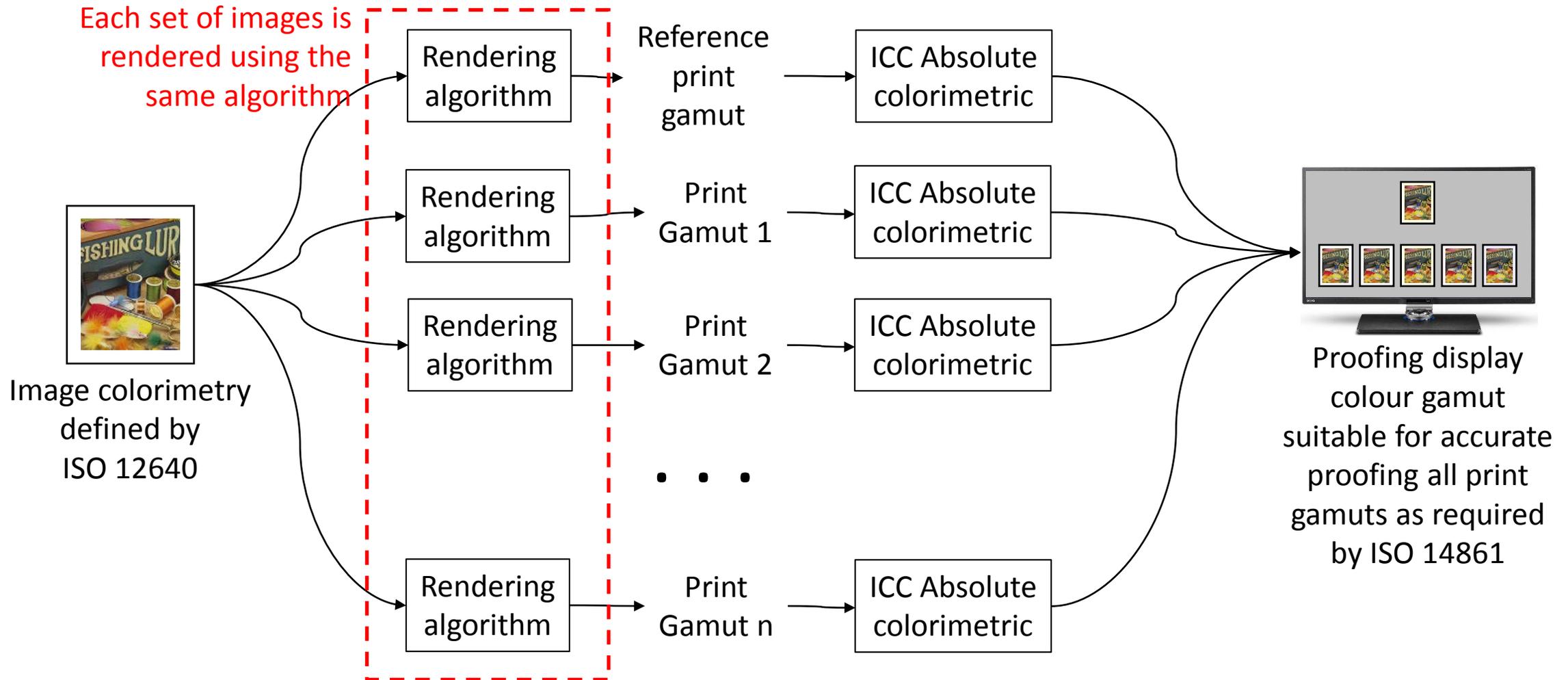
Consistent colour appearance test (a)

Reference

C

This set of reproductions has consistent colour appearance and good closeness to reference

B

This set of reproductions has poor consistency of colour appearance but is closer to reference than A

A

This set of reproductions has consistent colour appearance but poor closeness to reference

Closeness to reference

Consistent colour appearance

Fixed viewing environment
ISO 3664:2000 P2

Planned research projects

New TC proposal

Title: Consistency of colour reproduction within a single reproduction medium

Co-chairs: W Craig Revie (GB), Yasuki Yamauchi (JP)

Terms of Reference (Scope):

To study and report on sets of reproductions of the same source image that have a consistent colour appearance and are most similar to a reference reproduction, including recommending assessment methods that measure the similarity of reproductions of an image with different colour gamuts, for printed images on substrates with approximately similar characteristics in a fixed viewing environment. Only the effect of colour reproduction on appearance will be considered by this TC and so the assessment will be performed using hard copy or soft copy proofing.

To propose a metric which can measure consistency of colour appearance.

Initial Members

- Claas Bickeboeller (CH)
- Andy Kraushaar (DE)
- Chris Bai (TW)
- Craig Revie (UK)
- David McDowell (US)
- Elena A. Fedorovskaya (US)
- Gregory High (UK)
- Jan Morovic (UK)
- Nikolaus Pfeiffer (DE)
- Phil Green (NO)
- Philipp Tröster (DE)
- Robert Chung (US)
- Ronnier Luo (UK)
- Yasuki Yamauchi (JP)
- Yuan Jiang Ping (CN)

Discussion