

Second teleconference of Common Colour Appearance Focus Group

Tuesday 23rd August 2016

W Craig Revie

Agenda

- Introductions and background,
- Review of the CIE R8-13 report (see attached),
- Proposal for CIE TC on Common Colour Appearance,
- Possible research methods or tools
 - Andreas Kraushaar / Philipp Tröster : Fogra research plans
 - Yasuki Yamauchi : Yamagata research plans
 - Greg High : Gjøvik research plans
 - Elena Fedorovskaya / Bob Chung : RIT research plans
 - John Seymour : suggested research methods and tools
 - David McDowell : why the CRPCs produce common colour appearance
 - Jack Holm : explanation of what Jack thinks could be achieved
 - Claas Bickeboeller : explanation of what Claas thinks could be achieved
 - Craig Revie: standardisation of assessment method

Introductions

First teleconference presentations and minutes

International Color Consortium
MAKING COLOR SEAMLESS BETWEEN DEVICES AND DOCUMENTS

ICC: EVENTS:

- All ICC Events
- 2016
- 2016 ICC DevCon
- Displays & 3D print, 5-6 May Taipei 2016
- ICC Meetings - Taipei
- Print Business Outlook Conference, Mumbai, March 15
- NPES-ICC Color Management Conference, Jakarta, March 17
- Upcoming ICC Meetings
- 2015
- iccMAX Webinar April 22
- Medical Imaging Experts Day Mar 4
- Other ICC Medical Imaging meetings
- NPES-ICC Color Management Conference Feb 12
- 2014
- ICC Developer Conference: iccMAX
- DevCon iccMAX Q&A session
- Video of DevCon iccMAX

CIE Reportership R8-13 Common Colour Appearance

Reporters: Craig Revie (Fujifilm), Yasuki Yamauchi (Yamagata University)

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When a set of colour reproductions are judged to have a high degree of similarity, they are often said to have a 'Common Colour Appearance'. The degree of similarity is generally judged by subjective assessment. Although this term and similar terms are widely used it has no clear definition and there is currently no standard means of assessing whether a set of colour reproductions has common colour appearance.

For this reportership we plan to describe some example cases where sets of images share a common colour appearance and propose assessment methods that could be used to explore this idea further. One objective is to determine whether common colour appearance is a shared concept across observers and, if so, whether the degree of colour similarity of a set of colour reproductions can be measured objectively.

Images that are colour matched have a 'common colour appearance'. Colour matching, including media-relative colour matching is widely used for print production today but has a serious limitation when reproductions are to be made across a range of printing systems and displays as the reproductions must use the smallest colour gamut of all of the systems. The aim of this project is to explore ways of using the full colour gamut of all systems and at the same time retain common colour appearance.

This work is being done as part of CIE Reportership R8-13 Common Colour Appearance with a view to establishing a CIE Technical Committee to develop suitable objective measures.

First Teleconference on Common Colour Appearance
CIE R8-13 Focus Group, Monday 7th December (15:00 GMT)

Agenda

Start time	Presentation
3:24	1. Po-Chieh Hung: Clear definition of Common Colour Appearance and suggested plan of work
12:20	2. Jürgen Seitz: References for color communication
21:40	3. Philipp Tröster: Fogra common colour appearance metric
42:05	4. Yasuki Yamauchi: A metric to evaluate the closeness of the two colours
1:01:38	5. Mike Rodriguez: Development of ISO 15339 CRPCs
1:20:00	6. Greg High: Specific usage cases for a model of common colour appearance
1:29:00	7. Jan Morovic: Evaluation of sets of reproductions under multiple conditions
1:38:25	8. Jack Holm: Artistic intent and Common Colour Appearance

ICC: LIVE TOPICS:

- iccMAX
- ICC DevCon2016 program now available
- iccMAX Reference Implementation - v2.1.2 released
- Profile security
- ICC Medical Imaging Working Group
- New ICC White Paper on visualisation of colour on medical displays
- Research fund
- Display calibration
- New PRMG-based exchange profile for digital print
- Profiling tools
- ICC Profile Registry
- sRGB profiles
- ICC user forum
- Membership benefits
- What is an ICC Profile?
- What is FOGRA39?
- Common colour appearance**

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1:20:00	6. Greg High: Specific usage cases for a model of common colour appearance
1:29:00	7. Jan Morovic: Evaluation of sets of reproductions under multiple conditions
1:38:25	8. Jack Holm: Artistic intent and Common Colour Appearance
1:52:30	9. Ken Elsman: Two important aspects for Common Colour Appearance
1:59:45	10. Elena Fedorovskaya: Common Colour Appearance research at RIT
1:52:30	11. Claas Bickeboeller: Testing ICC Profiles for Common Colour Appearance using Roman 16 images
2:07:30	Craig Revie: The way forward for Common Colour Appearance (general discussion)

Start times indicate the time the presentation started in the **meeting recording**. Individual presentations are available by clicking on the presentation title.

Meeting notes

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

Review of R8-13 report

Review of the R8-13 report – feedback to date

- Terminology – the term ‘common colour appearance’ may be confusing (Jack Holm)
 - The Reportership and TC Proposal both use this term and so I propose to keep it for the time being as that could be confusing
 - In section 2 a paragraph will be added summarising the concerns raised and will recommend that the Technical Committee tries to identify a better term (“preferred reproduction with similar colour appearance to other members in a set” has been proposed)
- What is not mentioned is the fact that for these data sets the tone reproduction curves used are based on the procedures defined in CGATS TR015 (David McDowell)
 - Further explanation will be added to 4.1 based on content of Dave’s email
- Other feedback is expected from CIE national reviews – a revised version of the report will be circulated at the end of the review period
- Are there other points we should capture from the email thread?

Proposal for CIE TC on
Common Colour Appearance

CIE Technical Committee proposal: key dates

- 10-08-2016 Submission of CIE TC proposal
- 23-08-2016 Second teleconference on Common Colour Appearance
- 08-11-2016 Pre-TC meeting in San Diego (with remote access) followed by CIE Division 8 face-to-face meeting in San Diego
- Doodle poll First formal meeting of the new CIE TC
- 09-01-2017 Meeting at NTNU (Gjøvik) including workshop (1 day)
- XX-04-2017 ICC Meeting in Tokyo with short visit to Yamagata
- Jun / Aug Meeting at NTNU (Gjøvik) in conjunction with bi-annual symposium

CIE Technical Committee proposal details

Title

COMMON COLOUR APPEARANCE

Scope

To study and report on **common colour appearance**, including recommend assessment methods: that measure similarity of images on colour gamuts for output colour reproduction media.

NOTE There are many factors affecting appearance including resolution, texture, fluorescence, illumination and gloss. Determining the relative contribution of each factor is difficult and may be impossible. In order to set an achievable goal for a CIE Technical Committee we propose to limit the scope to the assessment of printed images on substrates with approximately similar characteristics in a fixed viewing environment. The objective is to identify a colour conversion algorithm or algorithms which preserve colour appearance when images are reproduced on devices with different colour gamuts.

Although this scope is limited it will allow the most pressing use case of reproduction of images in a graphic arts environment to be addressed.

TC Participation (not yet confirmed)

- United Kingdom (GB): Phil Green, Craig Revie, Paul Sherfield
- Japan (JP): Yasuki Yamauchi, Po-Chieh Hung
- Germany (DE): Andreas Kraushaar, Philipp Tröster, Roman Byshko, Claas Bickeboeller
- Norway (NO): Greg High, Peter Nussbaum
- United States (US): Elena A. Fedorovskaya, Robert Chung
- China (CN): Ronnier Luo, Muhammad Safdar, Yuan Jiang Ping
- Korea (KR): Choon-Woo Kim

Work plan

- Phase 1

- define and test assessment methods (all),
- each participant conducts individual research activities,
- results of research shared periodically (every six months).
- active research projects: Yamagata University, Fogra, NTNU (Gjøvik), RIT, Zhejiang University
- we should try to avoid duplicate research work

- Phase 2

- develop a Common Colour Appearance metric and/or model for a well-defined subset, for example reflection prints.

- Phase 3

- report writing

Impact metrics

- The best way to measure the effectiveness of our work would be through the number of standards (de facto or de jure) that build on it. This work has already been requested by ISO TC130 and ISO/IEC JTC1 SC28 as JWG14 would like to develop a standard based on this work.

Possible research methods or tools

- Andreas Kraushaar / Philipp Tröster : Fogra research plans
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Discussion and suggestions for
'pre-TC' meeting in San Diego