

# Report from CIE Division 8 Image technology

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From Annual Webex meeting  
Held on Friday 30<sup>st</sup> August 2024

# Division 8 : Image technology

- Terms of reference
  - To study procedures and prepare guides and standards for the optical, visual and metrological aspects of the communication, processing, and reproduction of images, using all types of analogue and digital imaging devices, storage media, and imaging media.
- Division Officers
  - Division Secretary Hermine CHATOUX (FR)
  - Division Editor Manuel MELGOSA (ES)
  - Division Director Noël RICHARD (FR)



# Report from CIE Division 8 Annual Meeting

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# Director Report

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# Director Report

- [General]
  - A new document to follow the TC, JTC ... activities
    - During all the Committee duration
- [Future meeting]
  - CIE Midterm, Vienna, Austria, 4-11 July 2025
    - 7-9 July → CIE Scientific conference
    - 10-11 July → CIE Division & TC meetings
  - CIE Session, Nanjing, China 2027
- [Technical]
  - “Datasets online” as digitization activity
  - Research Strategy updated

# Secretary report

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Hermine CHATOUX (FR)

# Technical committee

WD working draft at the TC level

CD committee draft at the Central Bureau level

TC#	Title	TC (lead-/co-) chair	Year	Remarks
TC8-12	Image and Video Compression Assessment	Pascal Bourdon (FR)	2007/ 2013	Report at committee stage (CD)
TC8-14	Specification of Spatio-Chromatic Complexity	Noël Richard (FR)	2015	Report at committee stage (CD)
TC 8-16	Consistency of colour appearance within a single reproduction medium	Craig Revie (UK)	2017	WD in ballot at TC level
TC 8-17	Methods for Evaluating Colour Difference between 3D Colour Objects	Kaida Xiao (GB)	2017	WD in progress
TC 8-18	Guidelines for Definition and Evaluation of High Dynamic Range Images and Image Sequences	Mekides Assefa Abebe (NO)	2021	In progress No info on CIE platform
JTC 12	The measurement of sparkle and graininess	Alejandro Ferrero (ES) D8: Noël Richard (FR)	2018	WD in progress
JTC 16	Validity of Chromatic Adaptation	Minchen Wei (HK) D8: Kaida Xiao (GB)	2018	In progress No info on CIE platform
JTC 17	Gloss measurement and gloss perception – A framework for the definition and standardization of visual cues to gloss	Frederic Leloup (BE) D8: Empty	2019	extension to the end of 2024 No info on CIE platform

# Reportership

DR#	Title	Reporter	Year	Remarks

No activities

# Research Forum

DR#	Title	Convener	Year
RF-01	Spectral Imaging	Masahiro Yamaguchi (JP)	2018

A new TC is proposed from RF-01

# Editor report

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Manuel MELGOSA (ES)

# Edition

- Review of WD of TC 8-16
  - ***Consistency of Colour Appearance within a Single Reproduction Medium.***
    - Chair: Craig Revie (UK); Co-chair: Yasuki Yamauchi (JP).
  - revision draft #7 (march 2024).
  - revision draft #9 (august 2024).
  - draft #10 under tc ballot since august 2024.
  
- Revision of TC proposal
  - ***Data representation space for spectral imaging***
    - Chair: Jean-Baptiste Thomas (FR),
  - Version 1: November 2023
  - Version 2: June 2024.
  - Version 3: September 2024

# Technical Committee Reports

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# Technical Committees

TC#	Title	TC (lead-/co-) chair	Year
TC8-12	Image and Video Compression Assessment	Pascal Bourdon (FR)	2007/ 2013
TC8-13	Colour Gamuts for Output Media	Kiran Deshpande (GB)	2013
TC8-14	Specification of Spatio-Chromatic Complexity	Noël Richard (FR)	2015
TC 8-16	Consistency of colour appearance within a single reproduction medium	Craig Revie (UK)	2017
TC 8-17	Methods for Evaluating Colour Difference between 3D Colour Objects	Kaida Xiao (GB)	2017
TC 8-18	Guidelines for Definition and Evaluation of High Dynamic Range Images and Image Sequences	Mekides Assefa Abebe (NO)	2021
JTC 10	A new colour appearance model for colour management systems: CIECAM16	Changjun Li (CN)	2017
JTC 12	The measurement of sparkle and graininess	Noël Richard (FR)	2018
JTC 16	Validity of Chromatic Adaptation	Kaida Xiao (GB)	2018
JTC 17	Gloss measurement and gloss perception – A framework for the definition and standardization of visual cues to gloss	(Vacant)	2019

# TC8-12 Image and Video Compression Assessment

- Chair: Pascal Bourdon(FR)
- Year established : 2007                      Extended to: 31/12/2024
- Terms of Reference:
  - To establish and report on the display and viewing conditions and materials for image and video compression quality evaluation in different applications including, but not limited to, web, mobile phones, HDTV, home cinema and digital cinema
- Members:
  - Bodrogi P, Bourdon P, Bovik A, Charrier C, Fernandez-Maloigne C, Hardeberg J, Larabi M.C, Lopez J.M, Otazu X, Pedersen M, Richard N, Rizzi A, Saad M, Saadane H
- Current Status and work plan
  - Committee Draft 5 submitted on April 28th 2023 with all remarks addressed
  - Dr Hermine Chatoux assigned as external expert reviewed on math. Formulations

# TC8-14 Specification of Spatio-Chromatic Complexity

- Chair: Noël RICHARD (FR)                      Co-chair: Mihai IVANOVICI (RO)
- Year established : 2015                      Extended to 31/12/2024
- Terms of Reference:
  - To produce a state-of-the-art report on the existing definitions of the complexity notation related to the aspects of non-uniform surfaces, generally defined as textured. To combine these definitions in order to produce a single embedding of the spatial and chromatic variations in a generic and vector form
- Members:
  - Authors : Deborah H., Ghorbel F., Ivanovici M., Kinjiro A., Lafon D., Melgosa M., Richard N.
  - Advisors : Hardeberg J., Fernandez-Maloigne C., Tanaka M.
- Current Status and work plan
  - Committee Draft 2 submitted on August 28th 2024 with all remarks addressed

# TC8-16 Consistency of colour appearance within a single reproduction medium

- Chair: Craig Revie (YK) Co-chair: Yasuki Yamauchi (JP)
- Year established : 2017 Extended to 31/12/2024
- Terms of Reference:
  - 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 of the source image. The report will include a recommendation for 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 hardcopy or softcopy proofing. To identify methods of assessment of, and comparison between, colour reproduction strategies considering their ability to maintain consistency of colour appearance with respect to a reference reproduction of the source image.
- Members:
  - 24 members from 9 countries
- Current Status and work plan
  - Working Draft 9 submitted on August 13th 2024 with all remarks addressed
  - Working Draft 10 proposed to ballot (TC level) at the end of September 2024

# TC8-17 Methods for Evaluating Colour Difference between 3D Colour Objects

- Chair: Kaida XIAO(GB)
- Year established : 2017                      Extended to 31/12/2024
- Terms of Reference:
  - To study the subjective assessment methods and recommend a dataset for colour difference evaluation of pairs of 3D colour objects. To prepare a report on the investigations of the effects on the perception of colour difference that may be caused by differences of 3D shape, gloss and material.
- Members:
  - Authors : Cui G. (CN), Melgosa M. (ES); Richard N. (FR); Perales E. (ES), He R. (GB), Sun P.-. (TW), Chen G. (CN), Morovic P.(ES), Ramasamy S. (US), Huang M. (CN)
  - Advisors : Bressler Y. (IL), Pointer M. (GB)
- Current Status and work plan
  - Ljubana 2023 :
    - 4 journals and 1 Phd published
    - A big 3D colour difference dataset produced
  - 2024 :
    - TC report in preparation by Ruili He and Kaida Xiao.

# TC8-18 Guidelines for Definition and Evaluation of High Dynamic Range Images and Image Sequences

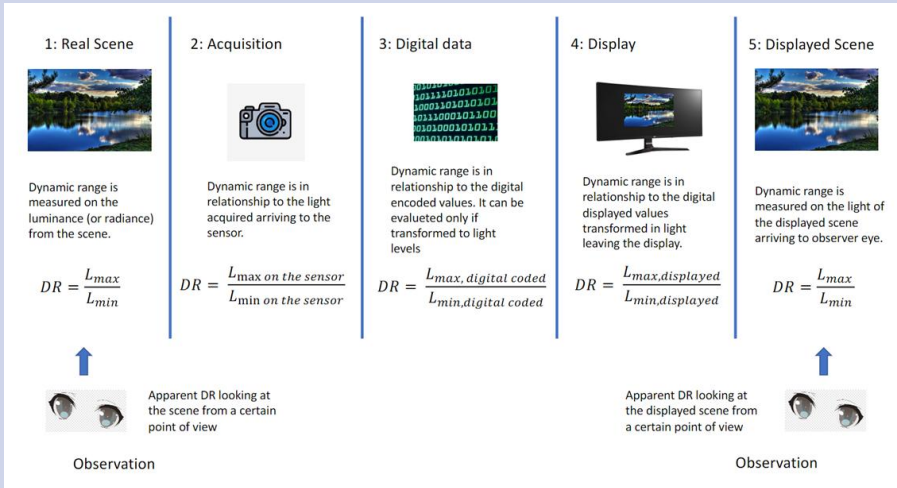
- Chair: Mekides Assefa Abebe (NO)
- Year established : 2021
- Terms of Reference:
  - To propose a **definition of High Dynamic Range (HDR) images** and image sequences (Images, hereafter), including luminance level, contrast, and spatial/temporal distribution. To define luminance levels, observing environment, adopted white point, the kinds of Images to be used in research experiments and their assessment. To recommend methods of calculating key characteristics of the HDR Images.
- Members:
  - 24 members, 11 countries
- Current Status and work plan
  - Lubjana 2023 : TC report in preparation, WD ballot planned for the end of 2023
    - 4 journals and 1 Phd published
    - A big 3D colour difference dataset
  - 2024 : meetings and advancement on the working draft. A first version is expected by the end of the year

# TC8-18 Guidelines for Definition and Evaluation of High Dynamic Range Images and Image Sequences

May 19th, 2021 - Oct. 13th, 2021	Nov. 30th, 2021	Jan 26th, 2022	March 2nd, 2022	April 6th, 2022	May 13th, 2022	Aug. 24th, 2022	Sep. 30th, 2022	Nov. 2nd, 2022	Feb 24th, 2023	March 31st, 2023	May 23rd, 2023	
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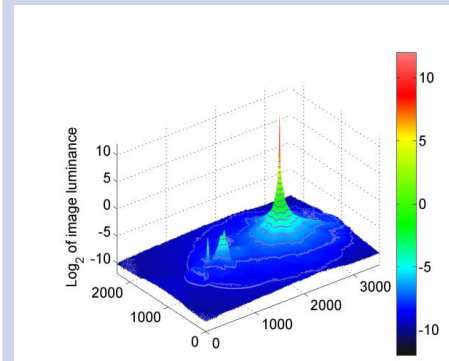
ToR review, Work plan creation, Identification of important terms related to HDR images and sequences, Collection of important document lists

Defining dynamic range, following HDR imaging pipeline. Definition of dynamic range with respect to physical light, digital representation, and perceptual cases were discussed. Related terms and factors such as glare, noise, quantization, ... were also raised in the discussions. Energy consumption of HDR imaging is also suggested to be considered.




Working draft outline is prepared. Tasks were assigned and TCMs started writing on important terms and definitions. The TC started discussing on selected sections of the WD such as Glare vs. dynamic range, and HDR experimental methodology and stimuli.

Terms related to Glare, Contrast, Quantization, and HDR perceptual stimuli were thoroughly discussed. Team members started writing on assigned titles of the working draft. A first draft of the WD is being prepared based on the TC's discussions in the past 16 meetings.



# TC8-18 Guidelines for Definition and Evaluation of High Dynamic Range Images and Image Sequences

**Current Status and work plan:**

 <b>WORKPLAN FOR CIE TECHNICAL COMMITTEES 8-18</b>			Year 1 - 2021				Year 2 - 2022				Year 3 - 2023				Year 4 - 2024			
Task	Responsible	Status	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
			preparing relevant documents list	All TCMs	Complete		■	■										
Literature review	All TCMs	In progress		■	■	■	■	■	■	■	■	■	■	■				
Identify HDR image and image sequence properties which should be defined	All TCMs	Complete		■	■	■												
Identify HDR imaging concepts which should be included in the TR	All TCMs	Complete		■	■	■	■	■										
Identify HDR experimental methodologies and components which needs clarification and guideline	All TCMs	In progress					■	■	■	■	■	■	■	■				
<b>Generating working draft</b>																		
Converting the literature review to WD of the TR	TCC	In progress							■	■	■	■	■	■				
Defining the structure of the WD	All TCMs	In progress							■	■	■	■	■	■				
Writing the full draft WD	some TCMs	In progress									■	■	■	■				
Refinement of the WD	All TCMs	In progress											■	■				
Generating Final WD	Insert	Not started											■	■				

# Joint technical committee reports

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## JTC 12 (D1/D2/D8)

# The measurement of sparkle and graininess

- Description of progress:
  - The measurement scales have been defined.
  - The main content in the working draft is already written, but we are working section by section to add missing secondary content, to remove redundancies, and to improve structure of the exposition.
  - Introduction is almost completed, and responsibilities for the section of sparkle scale have been assigned in order to complete the subsections.
  - The part of graininess would be address in the next few months.
  - The target was to have a completely finished version by the end of 2023,
  - and we are arranging meetings each month for that, but it is getting more and more apparent that our expectation is a little optimistic.

# JTC 16 (D1/D8)      Validity of Chromatic Adaptation

- Chair: Minchen (Tommy) WEI (HK)      D8 Co-chair : Kaida Xiao (GB)
- Year established : 2018      Extended to 31/12/2024
- Terms of Reference:
  - Recent experimental work revealed the incomplete chromatic adaptation under white light, especially those with low CCT and off-Planckian chromaticities, which are important to the performance of chromatic adaptation transforms. This was not considered in existing chromatic adaptation transforms (CATs). The TC will review the existing CATs and propose modifications by including a two-step transform to take the effect of white light chromaticity on degree of chromatic adaptation into consideration.
- Members:
- Current Status and work plan
  - A new experiment is being carried out by TCC, with expected data analysis to be performed in Sep 2023.
  - WD1 will be prepared by Feb 2024.
  - Comments from TC member by Jun 2024.
  - Voting by Sep 2024.

# JTC-17 Gloss Measurement And Gloss Perception: A Framework for The (D1/D2/D8) Definition And Standardization of Visual Cues to Gloss

- Chair: Frederic Leloup (BE) D8 Co-chair : someone is required
- Year established : 2018 Extended to 31/12/2024
- Terms of Reference:
  - To describe recommendations for standardised visual assessment conditions of individual, established cues to gloss, to make recommendations for the definition of a standard gloss observer for individual diagnostic cues and, based on the findings from the above, to suggest optical methods and metrics for describing gloss in correlation with the established gloss cues.
- Members:
- Current Status and work plan
  - Demand sent without response

# Research Forum reports

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# Research Forum Report

DR#	Title	Convener	Year
RF-01	Spectral Imaging	Masahiro Yamaguchi (JP)	2018

# RF-01 Spectral Imaging

- Convener: Masahiro Yamaguchi (JP)
- Year established : 2018 Extended to 31/12/2024
- Terms of Reference:
  - To discuss the future prospect of multispectral and hyperspectral imaging technology and identify the work items to be performed in the next step.
- Members:
  - 25 members from 11 countries
  - 6 observers from 5 countries
- Current Status and work plan
  - TC proposal reviewed by the D8 editor
  - To be submitted to the CB by early September

# Other Business

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# Discussion of publishing format

- *Some Tcs in the division have trouble using the CIE proposed word version*
  - *Some colleagues are not interested to participate due to MS-Word choice.*
- Open question for the discussion :
  - Discussed use of Latex versus Word with no definitive concensus

# Expected periodicity of the division 8 meeting

- CIE is expecting 1 meeting every year
  - To better help and follow the TC activities
- Division 8 meetings have been organized each year in conjunction with CIC
  - Inducing 2 division meetings in the same year
    - 2023 : September (CIE) and November (CIC)
      - Same content with 2 months of delay
  - Decided to not have Division 8 meeting in conjunction with CIC in 2024

Thank you!

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