

Colourlab





<http://www.colourlab.no>

Department of Computer Science

Administrative and technical staff

 30 Permanent
1 Temporary
31 Total

Software Engineering – SE

 11 Fast ansatte
21 Midlertidig
62 Totalt

Information Systems – IS

 14 Permanent
37 Temporary
51 Total

Data and Artificial Intelligence – DART

 29 Fast ansatte
33 Midlertidig
62 Totalt

Computing – COMP

 17 Fast ansatte
27 Midlertidig
44 Totalt

Applied Information Technology – AIT

 38 Fast ansatte
2 Midlertidig
50 Totalt

Colourlab

 12 Permanent
14 Temporary
26 Total



Intelligent Systems and Analytics – ISA

 11 Permanent
11 Temporary
22 Total



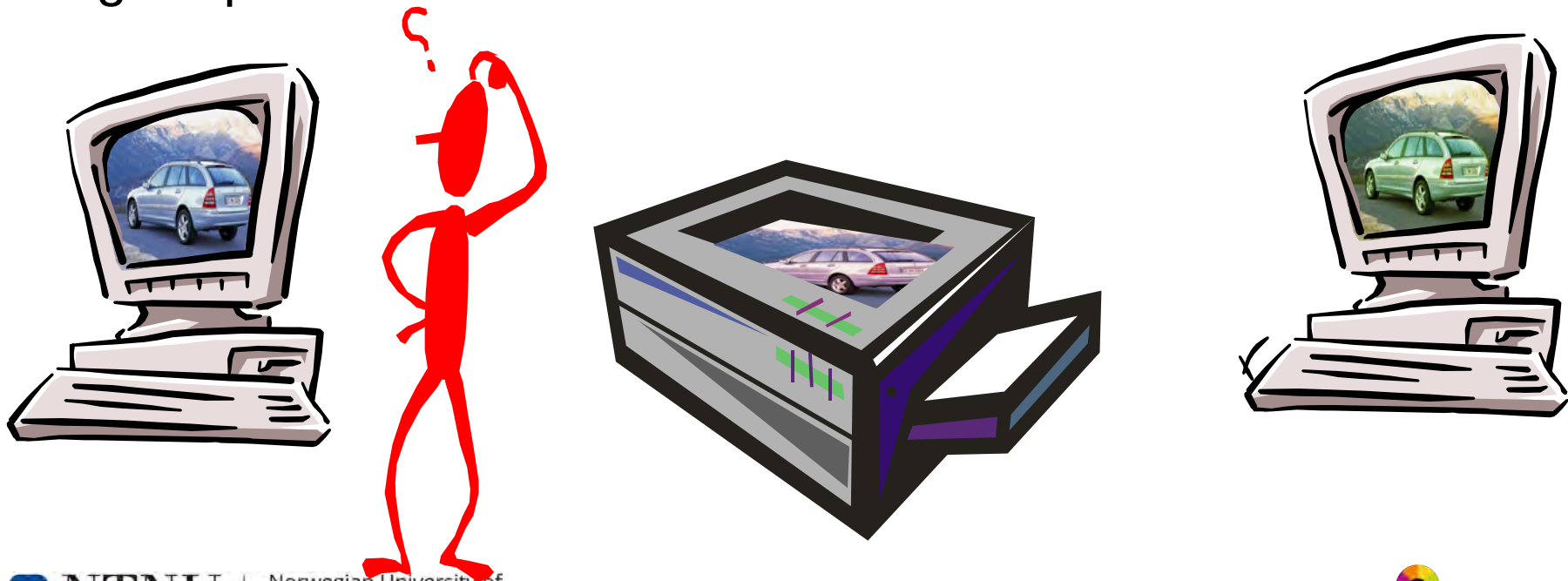
3000 Students

706 Learning assistants

13 Study programs

It all started with...

How can we achieve **consistent** and high-quality colour image reproduction in different media?



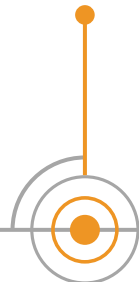
2001



Colourlab founded at Gjøvik University College.
Objective: serve the graphic arts industry's need for colour management

RCN SHP: “Multispectral Image Capture and Reproduction”

2003



2007



RCN SHP: “Perceptual image difference metrics - a unifying approach to image representation and reproduction”

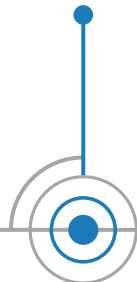
OCE: “Creation of a metric for perceptual image quality evaluation of color prints”

First PhD in the Colourlab awarded – Jeremie Gerhardt

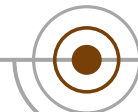
EU Framework 6 Marie Curie Conferences & Training Courses: CREATE - Colourlab Partner

EU FP7 ITN: “Colour Printing 7.0: Next Generation Multi-Channel Printing (CP7.0)”
Budget: 2.5M €

2011



2013



RCN SHP: “HyPerCept – Color and Quality in higher dimensions”
Budget: 33,66M NOK.

RCN FRIPRO (IKTPLUSS): "Spectral Skin Modelling and Rendering for Realistic Digital Faces"
Budget: 9.15M NOK

RCN IKTPLUSS: "Improved Pathology Detection in Wireless Capsule Endoscopy Images through Artificial Intelligence and 3D Reconstruction".
Budget: 16M NOK



"Academic Partnership for Excellence in Color Science (APECS)"
Budget: 4.8M NOK

"Perceptive Enhanced Realities of Coloured Collections through AI and Virtual Experiences (PERCEIVE)"
Budget: 10.7M Nok

2016



RCN IKTPLUSS: "IQ-MED: Image Quality enhancement in MEDical diagnosis, monitoring and treatment"
Budget: 16M NOK

EU H2020 ITN: "High Performance Soft-tissue Navigation (HiPerNav)" – Colourlab partner .
Budget: 4M €

2019



2021



RCN IKTPLUSS: VQ4Medics: Video Quality Assessment and Enhancement for Medical Services.
Budget: 14.49M NOK

RCN FRIPRO: "Quality and Content: understanding the influence of content on subjective and objective image quality assessment"
Budget: 12.71M NOK

"TransformAr- Innovation Packages for transformational adaptation of European regions and and communities "
Total Budget: 12.7M Euro

"AIHABs - AI-powered Forecast for Harmful Algal Blooms "
Budget: 1.3M NOK

2023



- “Baltic Flood Resilience and Digital Solutions” (Baltfloods). Budget: 2M€

- “Unified Nondesctructive Evaluation of historical Artifacts” (UNVEIL) Budget: 3.7M€

2025

2026

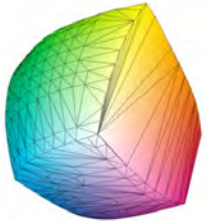
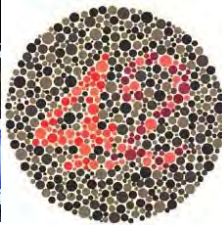
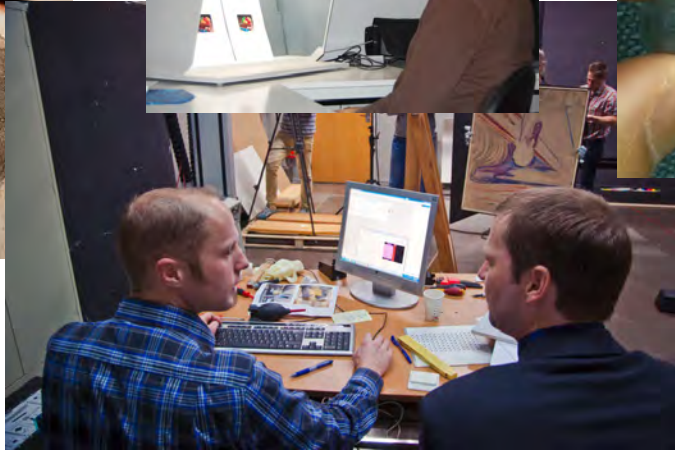
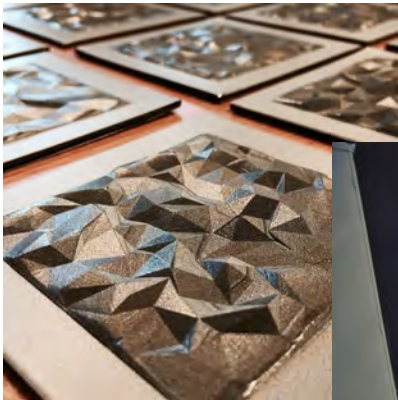


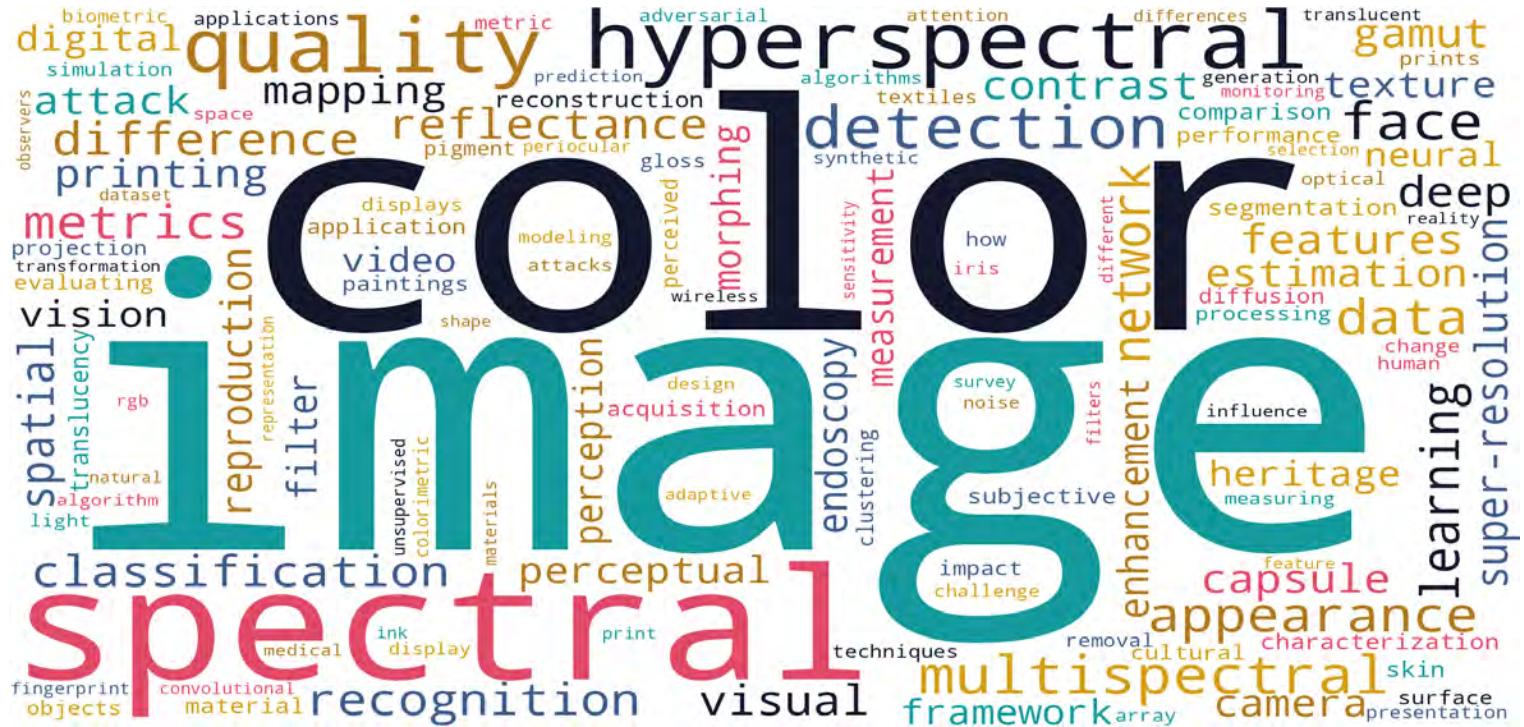
COLOURS: Collaborative On-Cloud Lab for the restoration of colour cultural heritage collection.
WILD-MAIDN: Why does It Look Different? - A National Doctoral Network
UNCHANGE: Understanding the Next Generation of Experts
Capture: Improved diagnosis through European doctoral collaboration in capsule endoscopy
DEFORM: Deepfake detection using Foundation Representation Models

200+ MNOK
Incl. 3 of Norway's 4 coordinated MSCA Doctoral Networks

Research

Cultural heritage · Health · Security/trust · Environment · Material appearance





53 PhD graduates and counting



Collaboration partners



Nasjonalbiblioteket



UNIVERSITY OF TWENTE

Idiap RESEARCH INSTITUTE



CHIBA UNIVERSITY



Hes·so

EURECOM

JUSTUS-LIEBIG-



Fogra



Canon



TECHNISCHE UNIVERSITÄT DARMSTADT



"norsk elektrisk optikk"

SCHWEIZERISCHES NATIONALMUSEUM, MUSEE NATIONAL SUISSE, MUSEO NAZIONALE SVIZZERO, MUSEU NAZIONAL SVIZZER



Centre of Excellence

UNIVERSITÀ DEGLI STUDI DI MILANO



Consiglio Nazionale delle Ricerche



GJØVIK KOMMUNE

TOMRA



lawtech research

TELECOM ParisTech



Ministère de l'Intérieur

Universidad de Granada



NINA

Norwegian Institute for Nature Research



POLITIET



INSTITUT D'OPTIQUE

université PARIS-SACLAY



stratas

CENTRE DE RECHERCHE ET DE RESTAURATION DES MUSÉES DE FRANCE



Netherlands Forensic Institute

MINISTÈRE DE L'INTÉRIEUR



Université BORDEAUX MONTAIGNE



Innlandet Hospital Trust



VU University Medical Center Amste



Università di Catania



Academy of Fine Arts in Warsaw



UNIVERSITY OF EASTERN FINLAND

UNIVERSITÉ PARIS 13

Yale

VUmc



Oslo University Hospital

VU University Medical Center Amste



DRYLAB

Colourlab



NTNU

Norwegian University of Science and Technology

Standardisation work

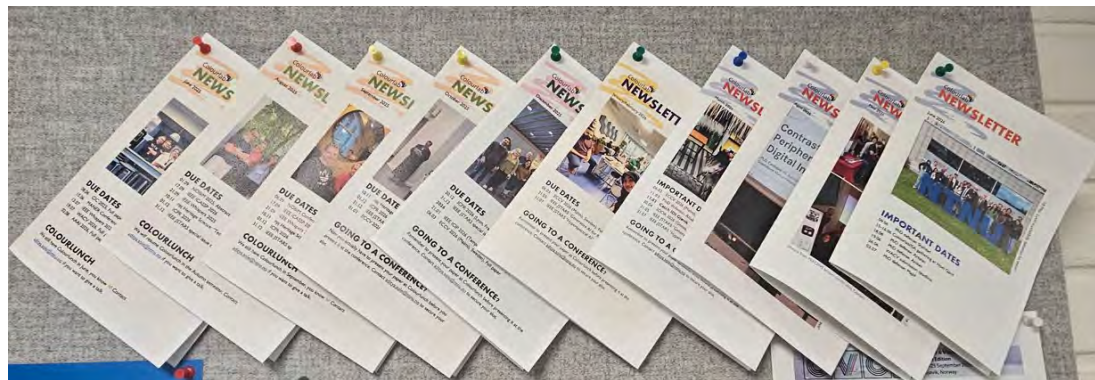
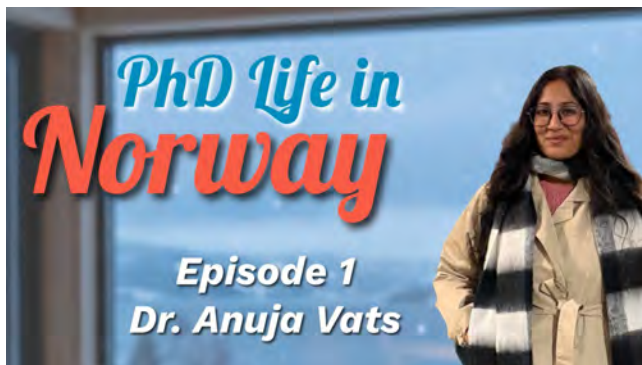
- CIE Division 1: Vision and Colour
- CIE Division 8: Image technology
- CIE TC8-07: Multispectral imaging
- TC 8-12 : Image and Video compression assessment
- CIE technical report R8-10
- ISO TC-130: Graphic technology
- ISO TC-42/JWG 26: Digitizing Cultural Heritage Materials
- ICC honorary member
 - ICC Technical Secretary: Phil Green



Upcoming events



Outside the lab



Study programmes at NTNU - IDI Gjøvik

🎓 Bachelor's degrees

- Computer science (BIDATA)
- Programming (BPROG)

🎓 Master's degrees

- Applied Computer Science (MACS)
- **Informatics (MSIT-G) - new specialisations in 2026:**
 - Programming & Security Engineering
 - Visual Informatics
- EMJMD: Computational Colour and Spectral Imaging (COSI)

🎓 PhD Programme

- Computer Science



Thank you for your attention





INTERNATIONAL
COLOR
CONSORTIUM

ICC HDR and Spectral Imaging Experts' Day

September 21, 2026

Gjøvik, Norway

NTNU



ICC Mission Statement

*Create, promote and encourage evolution of an
open, vendor-neutral, cross-platform colour
management system architecture and components*





Founding Members

Adobe Systems Incorporated

Agfa-Gevaert N.V.

Apple Computer, Inc.

Eastman Kodak Company

FOGRA-Institute (Honorary)

Microsoft Corporation

Silicon Graphics Inc.

Sun Microsystems, Inc.

Taligent, Inc.





Today's ICC

53 international members.

11 Steering Committee meetings per year.

Regular ICC events in multiple countries.

3 full meetings per year on 3 different continents.

1 organization supporting industrial color interchange standards.





Join ICC!

- **Active work areas:**
 - Architecture
 - Display
 - HDR
 - Packaging & Graphic Arts
- **Network:**
 - Active companies
 - Color scientists
- **Look ahead:**
 - Confluence of standards organizations



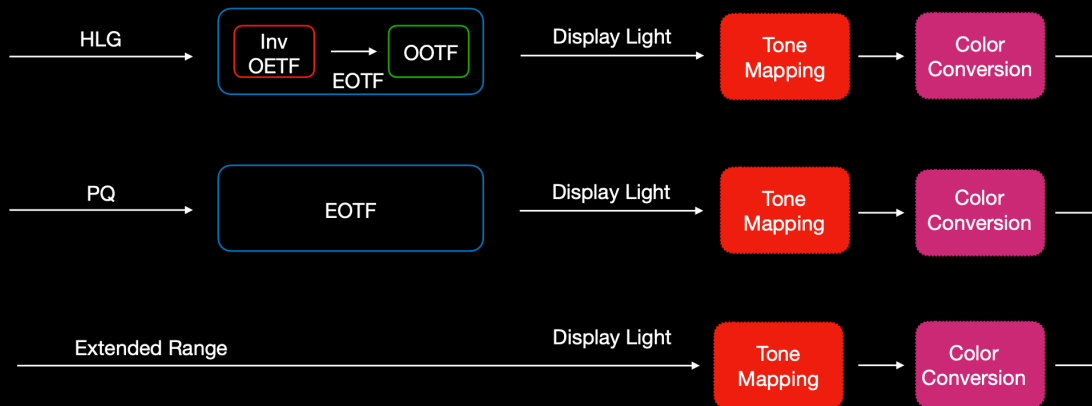


HDR



HDR Content Management Workflows

HDR content reproduction on devices with various capabilities





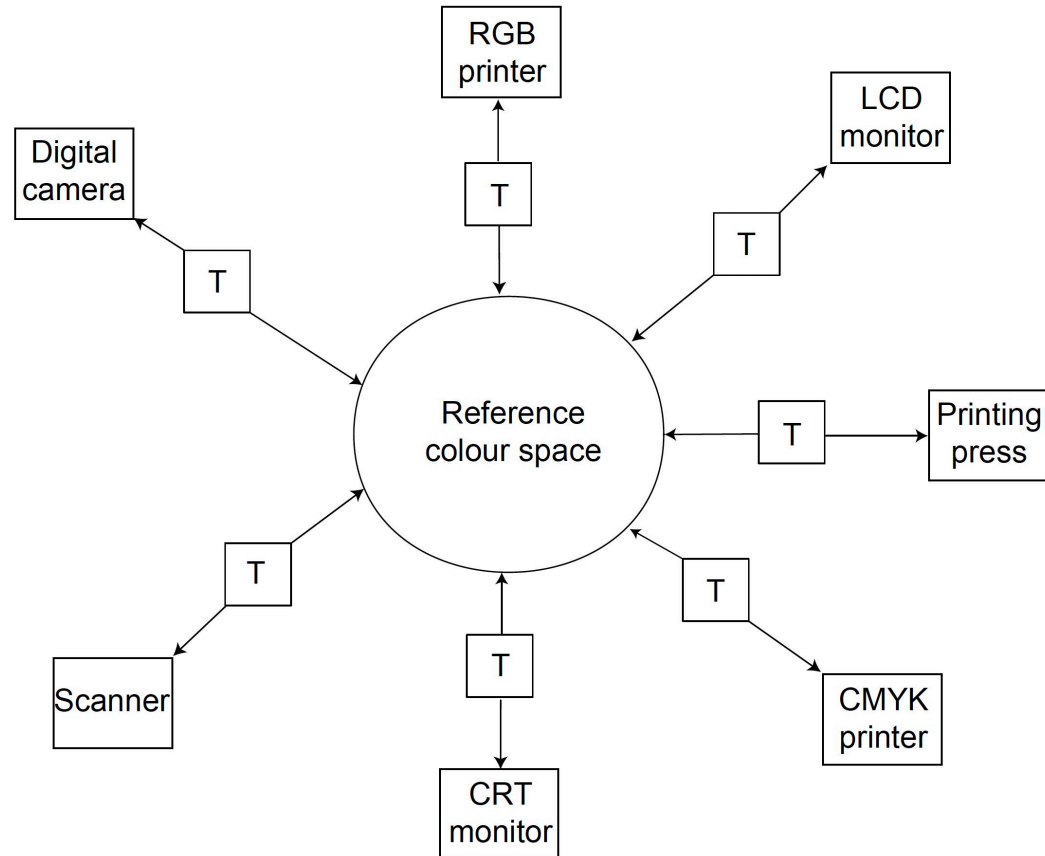
ICC Support for HDR

Extending existing standards and provide backward compatibility

- HDR Working Group created in 2019
 - works closely with other standards organization: ISO TC-42, SMPTE
- Results: new HDR oriented new tags
 - CIECP tag approved on October 1st, 2021
 - Adaptive Gain Curve (ADGC) tag approved on April 17th, 2025
 - HDR metadata in ICC Metadata Registry: **MDCV**, **CCV**, **CLL** and **CRWL**
- Emphasis on Backward Compatibility
 - v4 A2B0 tag provides conversion from HDR to SDR for older CMMs

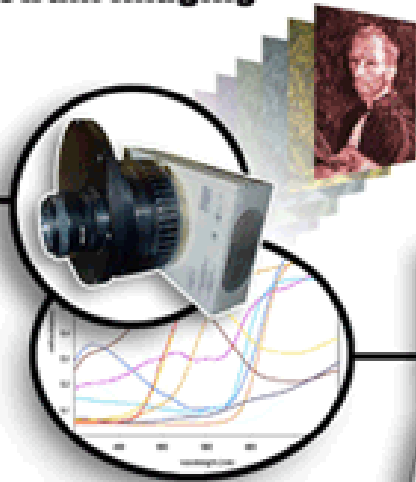
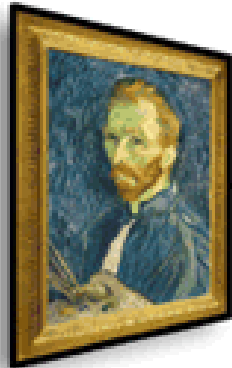


SPECTRAL IMAGING



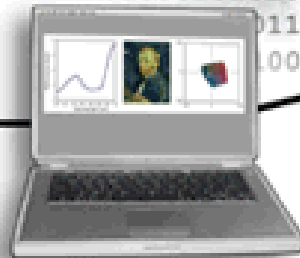


Multi-Channel Visible Spectrum Imaging



Digital Archiving

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and Reproduction





Challenges

- **People are squishy**
- **Data is big**
- **World is broad**
- **Time is money**



Today's Agenda

New MSCA research projects at Colourlab	Jon Hardeberg, NTNU
Introducing the COLOURS Project: Colour Management for Cultural Heritage	Tanzima Habib (NTNU)
Recent work on Helmholtz-Kohlrausch effect	Greg High (NTNU)
Device characterization using deep learning and AI	Hamza Zafar (NTNU)
Break	
TBC	Nina Eckertz
Digital cinema and observer metamerism	Giorgio Trumpy (NTNU)
The headroom adaptive gain curve (HAGC)	Ronan Boitard (Apple)
New in ICC	Luke Wallis (Apple)
HDR support on the major software platforms	Chris Cameron (Google)
Implementing HAGC in an ICC v4 AToB0 look-up table	Luke Wallis (Apple)
Pizza Buffet Provided	



Today's Agenda

HDR and backlit print	Florian Süßl (Berliner Hochschule für Technik) and Dorin Pitigoi (Grup Transilvae s.r.l.)
HDR and glare	Beatrice Sarti (Università degli Studi di Milano)
Unique hue assessment on display	Kaida Xiao (University of Leeds)
Chromatic adaptation under diverse illumination conditions	Shining Ma (Beijing Institute of Technology)
Break	
Tristimulus calculation	Phil Green (NTNU)
CIE LMS/XYZ developments	Andrew Stockman (University College London)
Optimized colour matching functions for display colour consistency	Francisco Imai and Shahram Peyvandi (CIE JTC22)
Introduction to iccMAX and iccDEV	Max Derhak (Onyx Graphics) and Adam Dewitz (APTech)