Fargelaboratoriet og samarbeid med partnervirksomheter

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The Norwegian Colour and Visual Computing Laboratory

- **Quick history:**
  - Established at Gjøvik University College (GUC) in 2001 to serve the graphic arts industry’s need for **colour management**
  - In 2012 the name changed from The Norwegian Color Research Laboratory to The Norwegian Colour and Visual Computing Laboratory.
  - 2016 – joining NTNU
- **Well equipped laboratory facilities**
  - Colour and spectral measurement, Colour management software, viewing booths, image acquisition and reproduction devices, etc.
  - >200m²
- **Research group** at Faculty of Computer Science and Media Technology at NTNU
  - 43 members
  - 7 permanent staff members
  - 14 temporary, post doc, visiting, and adjunct faculty
  - 3 associated members
  - 19 PhD students
- **A center** for fundamental and applied research within **colour** science, imaging, and **image/video** processing
- **Education**
  - Courses and projects to media bachelors and **Master of Applied Computer Science**
  - Erasmus+ Erasmus Mundus Joint Master’s Degree **COSI** (Color in Science & Industry)
  - International Erasmus Mundus master **CIMET** (Color in Informatics and Media Technology)
  - French-Norwegian master programme: 3D Multimedia Technology
  - Master programme with South China University of Technology in printing.
- **International**, national, and regional collaboration with industry and academia
- **Successful in attracting external funding**
- **Website:** [http://www.colourlab.no](http://www.colourlab.no)
Permanent faculty

- **Professor Jon Y. Hardeberg**
  - Multispectral color imaging
  - Cultural heritage imaging

- **Associate Professor Peter Nussbaum**
  - Colour management
  - Print quality

- **Associate Professor Marius Pedersen (lab director)**
  - Image quality
  - Print Quality

- **Professor Ivar Farup**
  - Colorimetry
  - Spatial gamut mapping
  - Colour image processing

- **Associate professor Faouzi Alaya Cheikh**
  - Video and image processing
  - Compression
  - Quality

- **Professor Phil Green**
  - Colour management
RESEARCH OVERVIEW

«FROM MUNCH TO PILL CAMERAS» (OA 8.1.2016)
The existential research question:

• How can we achieve consistent colour image reproduction in different media?
Graphic arts industry

• **Colour management**

• **Print quality evaluation**

• **PSO colour certification**
  – Certifying the Norwegian printing industry according to the UGRA system of PSO Certification.
  – [www.colourlab.no/psoinfo](http://www.colourlab.no/psoinfo)
Media technology industry

• Display technology

• Movie production

• Redeye correction

• Videoconferencing
Computer vision

- **Bottle recycling automata**
  - Tomra
  - 2004, 2007-2008

- **Coffee bean sorting**
  - Le Moan, Amin, Pérez, Voisin, Hardeberg. Convex Objects Recognition and Classification Using Spectral and Morphological Descriptors. CGIV 2010
Video surveillance

- **Compression**

- **Saliency**

- **Detection and tracking of objects**

- **Face recognition**
Cultural heritage imaging

• **In-painting**

• **Lost art reclamation**

• **Film restoration**

• **Pigment identification**
Colour and quality in medical imaging

• **Capsule video endoscopy**
  - In collaboration with Innlandet Hospital

• **Image Quality in CT**
  - In collaboration with Oslo University Hospital

• **Video guided surgery**
  - In collaboration with Oslo University Hospital

• **Skin imaging**
  - In collaboration with VU Medical Center, Amsterdam, and others
Image quality and image difference

- **Metrics**

- **Psychophysical experiments**
Colour deficiency

• Improving maps for color deficient users

• Daltonization
Colour Printing 7.0: Next Generation Multi-Channel Printing

- 4 year training and research project (2011-2015)
  - ITN - Initial Training Network, EU FP7, Marie Curie Actions
  - Network of European Universities, Research institutes, and companies
  - Coordinated by Gjøvik University College, Prof. J. Y. Hardeberg
  - [http://www.cp70.org](http://www.cp70.org)

- Funding of
  - 7 PhD students and 2 postdocs
  - Research and training activities
  - Appx 2.16 MEUR, 17 MNOK from the EU

- A breakthrough for the Colourlab (and GUC)
  - “Høgskoleforskning i verdensklasse” (Forskerforum 10.4.12)
  - “Ikke hverdagskost” (OA, 11.12.12)
Measuring and Understanding Visual Appearance

• From colour to appearance
• FRIPRO Toppforsk project
  – 25 million NOK over 5 years (2016-2021), funded by the Research Council of Norway and NTNU in Gjøvik
  – Starting summer 2016-2021.
  – One of only six TOPPFORSK projects at NTNU
  – Two PhD students and three post doctoral researchers
• Research council:
  – «Toppforsk satser på fagmiljøer med stort potensial».
  – «Bygge opp internasjonalt ledende forskningsmiljø»
• Four excellent international research partners
Colourlab: what’s next (2016)?

- Opportunities and challenges in NTNU reorganization
- Keep applying for external funding
- Broad and deep: from fundamental research to research driven innovation
- Collaboration cross-sector, cross-border, cross-discipline