9th IS&T/SID Color Imaging Conference 2001

Color Science and Engineering: Systems, Technologies, Applications

Scottsdale, Arizona, USA
6 – 9 November 2001

ISBN: 978-1-62276-627-7
The Papers Program

Wednesday, November 7, 2001, 8:00 to 9:00 am

8:00 am Welcome from IS&T President, Wayne Jaeger and SID President, Aris Silzars

Keynote Presentation

8:05 am Saturation, Superfluous or Superior?  
Robert W. G. Hunt, Colour Consultant, England

Wednesday, November 7, 2001, 9:00 to 9:50 am

Image Content Analysis

Session Chair: Hiroaki Kotera, Chiba University, Japan

9:00 am Multidimensional Analysis Reveals Importance of Color for Image Quality  
Ethan D. Montag, Munsell Color Science Laboratory, Rochester Institute of Technology, USA  
Hirokazu Kasahara; Epson Research & Development, Inc., USA

9:25 am Measurement of Omnidirectional Light Distribution by a Mirrored Ball  
Shoji Tominaga and Norihiro Tanaka, Osaka Electro-Communication University, Japan

Wednesday, November 7, 2001, 10:30 to 11:45 am

Image Content Analysis (continued)

Session Chair: Brian Funt, Simon Fraser University, Canada

10:30 am Illuminating Illumination, Jeffrey M. DiCarlo, Feng Xiao, and Brian A. Wandell,  
Stanford University, USA

10:55 am A Indoor/Outdoor/Close-up Photo Classifier  
R. Schettini and A. Valsasna, ITIM, Consiglio Nazionale delle Ricerche, Italy  
C. Brambilla, IAMI, Consiglio Nazionale delle Ricerche, Italy  
M. De Ponti, STMicroelectronics, TPA Group, Printer Division, Italy

11:20 am Automatic Color Correction Based on Generic Content-Based Image Analysis  
Michael Schröder and Stefan Moser, Gretag Imaging AG, Switzerland

Wednesday, November 7, 2001, 1:30 to 2:45 pm

Spectral Image Analysis

Session Chair: Roy S. Berns, Rochester Institute of Technology, USA

1:30 pm A Geometric Foundation of Colorimetry  
Reiner Lenz, Linköping University, Sweden

1:55 pm Measurement of Surface Reflection Properties  
Norihiro Tanaka and Shoji Tominaga, Osaka Electro-Communication University,  
Department of Engineering Informatics, Japan

2:20 pm Compact Description of 3D Image Gamut by Singular Value Decomposition  
Hiroaki Kotera and Ryoichi Saito, Chiba University, Japan
Wednesday, November 7, 2001, 3:15 to 5:40 pm

**Spectral Image Analysis (continued)**
*Session Chair: Patrick Herzog, Aachen University of Technology, Germany*

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>3:15 pm</td>
<td>The Estimation of Spectral Reflectances Using the Smoothest Constraint Condition</td>
<td>Changjun Li and Ronnier Luo, University of Derby, United Kingdom</td>
</tr>
<tr>
<td>3:40 pm</td>
<td>Multispectral Image Compression for Color Reproduction; Weighted KLT and Adaptive Quantization based on Visual Color Perception</td>
<td>Yuri Murakami, Hiroyuki Manabe, Takashi Obi, Masahiro Yamaguchi, Nagaaki Ohyama, Tokyo Institute of Technology, Frontier Collaborative Research Center, Japan</td>
</tr>
<tr>
<td>4:05 pm</td>
<td>Statistical Characterization of Spectral Reflectances in Spectral Imaging of Human Portraiture</td>
<td>Qun Sun and Mark D. Fairchild, Rochester Institute of Technology, USA</td>
</tr>
<tr>
<td>4:30 pm</td>
<td>Real-time Multi-Spectral Image Processing for Mapping Pigmentation in Human Skin</td>
<td>Daisuke Nakao, Norimichi Tsumura, and Yoichi Miyake, Chiba University, Japan</td>
</tr>
<tr>
<td>4:55 pm</td>
<td>Pigment Identification of Artist Materials Via Multi-Spectral Imaging</td>
<td>Roy Berns and Francisco H. Imai, Munsell Color Science Laboratory, Rochester Institute of Technology, USA</td>
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Thursday, November 8, 2001, 8:00 to 8:45 am

**Keynote Presentation**

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Author</th>
</tr>
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<tbody>
<tr>
<td>8:00 am</td>
<td>Color Categories in Various Color Spaces</td>
<td>Hirohisa Yaguchi, Department of Information and Image Sciences, Chiba University, Japan</td>
</tr>
</tbody>
</table>

**IS&T Honors and Awards Presentation**
Thursday, November 8, 2001, 8:45 to 9:15 am
*IS&T President Wayne Jaeger*

Thursday, November 8, 2001, 9:30 to 10:05 am

**Color Science**
*Session Chair: Raja Bala, Xerox Corporation, USA*

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Author</th>
<th>Institution</th>
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<tbody>
<tr>
<td>9:30 am</td>
<td>Assimilation and Contrast</td>
<td>John McCann</td>
<td>McCann Imaging, USA</td>
</tr>
<tr>
<td>9:55 am</td>
<td>Chroma Scaling and Crispening</td>
<td>Nathan Moroney</td>
<td>Hewlett-Packard Laboratories, USA</td>
</tr>
</tbody>
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Thursday, November 8, 2001, 10:30 am to 12:10 pm

**Color Science (continued)**

*Session Chair: Raimondo Schettini, Institute of Multimedia Information Technology, Italy*

10:30 am  
**What is the Chrominance of “Gray”?**  
*Raja Bala, Xerox Digital Imaging Technology Center, USA*

10:55 am  
**Darwinism of Color Image Difference Models**  
*Garrett M. Johnson and Mark D. Fairchild, Munsell Color Science Laboratory, Rochester Institute of Technology, USA*

11:20 am  
**Color Imaging with JPEG 2000**  
*Robert Buckley, Xerox Architecture Center, Xerox Corporation, USA*

11:45 am  
**Lippmann Photography and Color Holography: 2-D and 3-D Color Imaging Techniques**  
*Hans I. Bjelkhagen, De Montfort University, United Kingdom*

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Thursday, November 8, 2001, 2:00 to 5:00 pm

**The Interactive Session**

*Light refreshments will be served during this Session to create a relaxed atmosphere and promote lively technical discussions between attendees and the presenters as they stand by their posters.*

- **Non-Linear Embeddings and the Underlying Dimensionality of Reflectance Spectra and Chromaticity Histograms**  
  *Brian Funt, Dejan Kulpinski, Simon Fraser University, Canada*
  *Vlad Cardei, Polaroid Corporation, USA*

- **A Computational Model for the Design of a Multispectral Imaging System**  
  *David Connah, Stephen Westland, and Mitchell G. A. Thomson, Colour & Imaging Institute, University of Derby, United Kingdom*

- **Multispectral Image Encoding and Compression**  
  *Lindsay MacDonald, Stephen Westland, and Dongmei Liu, Colour & Imaging Institute, University of Derby, United Kingdom*

- **Illuminant Estimation Based on von Kries Transformation and Gamut Comparison**  
  *Xiaoyun Jiang and Noboru Ohta, Munsell Color Science Laboratory, Rochester Institute of Technology, USA*

- **Memory Colors as Illuminant Predictors**  
  *Ted Cooper, Sony Media Processing Division, USA*

- **Measurement and Modeling for the Two Dimensional MTF of the Human Eye and Its Application for Digital Color Reproduction**  
  *Yoichi Miyake, Tetsuya Ishihara, Keitaro Ohishi and Norimichi Tsumura, Department of Information and Image Sciences, Chiba University, Japan*

- **Gamut Extension Modelling Based on Observer Experimental Data**  
  *Byoung-Ho Kang, Maeng-Sub Cho, CSTL/ETRI, Korea*
  *Jan Morovic, M. R. Luo, Colour and Imaging Institute, University of Derby, United Kingdom*
Hue Constancy of RGB Spaces
Nathan Moroney and Jason Gibson, Hewlett-Packard, USA

Which Color Similarity Measure is Most Effective for Background-Frame Differencing?
Michael Hild and Toshinobu Emura, Osaka Electro-Communication University, Japan

Herding CATS: A Comparison of Linear Chromatic-Adaptation Transforms for CIECAM97s
Anthony J. Calabria and Mark D. Fairchild, Munsell Color Science Laboratory, Rochester Institute of Technology, USA

The Influence of Constant Luminance on Digital Video
Jin-Seo Kim, Byoung-Ho Kang, Jae-Chul Kim, Tae-Wook Heo, Jae-Young Jung, and Dae-Hee Kim, Colour Imaging Team, CSTL/ETRI, Korea

Halftoning and Color Noise
Sasan Gooran, Linköping University, Sweden

Multilevel Color Halftoning
Joan L. Mitchell, Gehard Thompson, and Chai Wah Wu, IBM T.J. Watson Research Center, USA
Timothy J. Trenary and Yue Qiao, IBM Printing Systems Division, USA

Modified Jointly-Blue Noise Masks Approach Using s-CIELAB Color Difference
Yong-Sung Kwon, Yun-Tae Kim, Ho-Keun Lee, and Yeong-Ho Ha, Kyungpook National University, Korea

CMYK Halftoning Algorithm Based on Direct Binary Search
Je-Ho Lee and Jan P. Allebach, School of Electrical and Computer Engineering, Purdue University, USA

Automatic Color Correction for Ink Cartridge Variations
Chia-Lin (Charlie) Chu, Alp Bayr amoglu, and Henry D’Souza, Compaq Computer Corporation, USA

Spectral Color Reproduction Based on Six-Color Inkjet Output System
Lawrence A. Taplin and Roy Berns, Munsell Color Science Laboratory, Rochester Institute of Technology, USA

The Impact of Paper on Ink: From the Photomechanical Printer’s Perspective
Carinna Parraman and Stephen Hoskins, University of the West of England, United Kingdom

Colorimetric Thresholds for Printed Images
Tao Song and Ronnier Luo, University of Derby, United Kingdom

Color Transformation Accuracy and Efficiency ICC Color Management
Huanzhao Zeng, Hewlett-Packard Company, USA
Mary Nielsen, Hewlett Packard, USA

Proposal for Color Management of LCD
Yasuhiro Yoshida and Yoichi Yamamoto, IC Development Group, Sharp Corporation, Japan

Color Characterisation of a Digital Cine Film Scanner
Leonardo Noriega, Ian Morovic, and Lindsay MacDonald, Colour and Imaging Institute, University of Derby, United Kingdom
Wolfgang Lempp, Computer Film Company, United Kingdom

Color Reproduction Using “Black-Point Adaptation”
Sun Ju Park and Mark D. Fairchild, Munsell Color Science Laboratory, Rochester Institute of Technology, USA
Non–Iterative Minimum ΔE Gamut Clipping
Jan Morovic and Pei-Li Sun, Colour & Imaging Institute, University of Derby, United Kingdom

Gamut Mapping with Enhanced Chromaticness
Chengwu Cui, Lexmark International, Inc., USA

Investigating Inverse Gamut Mapping of Current Color Management Tools
Hendrik Büring and Patrick G. Herzog, Technical Electronics Institute, Aachen University of Technology, Germany
Eggert Jung, NexPress GmbH, Germany

Answering Hunt’s Web Shopping Challenge: Spectral Color Management for a Virtual Swatch
Mitchell R. Rosen, Lawrence A. Taplin, Francisco H. Imai, Roy S. Berns, and Noboru Ohta, Munsell Color Science Laboratory, Rochester Institute of Technology, USA

Preferred Color Reproduction of Images with Unknown Colorimetry
Scot R. Fernandez and Mark D. Fairchild, Munsell Color Science Lab, Rochester Institute of Technology, USA

Adaptive Quartile Sigmoid Function Operator for Color Image Contrast Enhancement
Chao-hua Wen, Jyh-jiun Lee and Yi-chin Liaw, Industrial Technology Research Institute, ROC

Color Calibrated High Dynamic Range Imaging with ICC Profiles
Michael Goesele, and Hans-Peter Seidel, Max-Planck-Institut für Informatik, Germany
Wolfgang Heidrich, The University of British Columbia, Canada

Scaling the Evolutionary Models for Signal Processing System Optimization with Applications in Digital Video Processing
Walid S. Ibrahim Ali, Philips Research, USA

Friday, November 9, 2001, 8:00 to 9:00 am
Keynote Presentation

8:00 am High Dynamic Range Imaging
Greg Ward, Exponent—Failure Analysis Associates, USA

Friday, November 9, 2001, 9:00 to 9:50 am
Printing
Session Chair: J. A. Stephen Viggiano, RIT Research Corporation, USA

9:00 am Model Based Color Separation for CMYKcm Printing
A. Ufuk Agar, Hewlett-Packard Laboratories, USA

9:25 am Measurement Problems for Overhead Projection Transparency Printing Color Calibration
Chengwu Cui and Steve Weed, Lexmark International, USA
Friday, November 9, 2001, 10:20 to 11:35 am

**Chromatic Adaptation**

*Session Chair: Naoya Katoh, Sony Corporation, Japan*

10:20 am  
**Is the Sharp Adaptation Transform More Plausible than CMCCAT2000?**

*Graham D. Finlayson and Peter Morovic,* School of Information System, University of East Anglia, United Kingdom

10:45 am  
**Incomplete Chromatic Adaptation under Mixed Illuminations**

*Suchitra Sueeprasan and Ronnier Luo,* Colour & Imaging Institute, University of Derby, United Kingdom

11:10 am  
**Spherical Sampling and Color Transformations**

*Graham D. Finlayson,* School of Information Systems, University of East Anglia, United Kingdom  
*Sabine Süsstrunk,* Laboratory for Audiovisual Communications, Swiss Federal Institute of Technology, Switzerland

Friday, November 9, 2001, 1:30 to 2:45 pm

**Capturing**

*Session Chair: Po-Chieh Hung, Konica Corporation, Japan*

1:30 pm  
**Optimal Design of Camera Spectral Sensitivity Functions Based on Practical Filter Components**

*Shuxue Quan, Noboru Ohta, and Roy S. Berns,* Munsell Color Science Lab., Rochester Institute of Technology, USA  
*Naoya Katoh,* PNC Development Center, Sony Corporation, Japan

1:55 pm  
**Minimal-Knowledge Assumptions in Digital Still Camera Characterization I: Uniform Distribution Toeplitz Correlation**

*J. A. Stephen Viggiano,* RIT Research Corporation, USA

2:20 pm  
**3D Recording and Rendering for Art Paintings**

*Shoji Tominaga, Toshinori Matsumoto and Norihiro Tanaka,* Osaka Electro-Communication University, Japan

Friday, November 9, 2001, 3:15 to 4:30 pm

**Displays**

*Session Chair: Gary K. Starkweather, Microsoft Corporation, USA*

3:15 pm  
**Color Balancing Experimental Projection Displays**

*Maureen C. Stone,* StoneSoup Consulting, USA

3:40 pm  
**DLP Cinema™ Technology: Color Management and Signal Processing**

*Greg Pettitt and Brad Walker,* Texas Instruments, USA

4:05 pm  
**Accurate Prediction of Colours on Liquid Crystal Displays**

*Youngshin Kwak and Lindsay MacDonald,* Colour & Imaging Institute, University of Derby, United Kingdom