Some format issues inherent in the e-media version may also appear in this print version.
### The Papers Program

**Wednesday, November 18, 1998**

## Color Science

**Introduction to the Color Imaging Conference**

*Sabine Süsstrunk, Corbis Corporation and Andras Lakatos, Xerox Corporation*

**Wednesday Morning, November 18, 1998**

### Session I: Human Visual Systems

Session Chair: *Paula Alessi*, Eastman Kodak Company

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:15 am</td>
<td><strong>Keynote</strong>—Physiological Mechanisms of Primate Color Vision</td>
<td>David H. Hubel, Harvard University, USA</td>
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<tr>
<td>9:00 am</td>
<td>Multiscale Model of Adaptation, Spatial Vision and Color Appearance</td>
<td>Sumanta N. Pattanaik, Mark D. Fairchild, James A. Ferwerda, and Donald P. Greenberg, Program of Computer Graphics, Cornell University, Ithaca, New York, USA; Center for Imaging Science, RIT, Rochester, New York, USA</td>
</tr>
<tr>
<td>9:25 am</td>
<td>Development and Testing of a Color Space (IPT) with Improved Hue Uniformity</td>
<td>Fritz Ebner, Xerox Corporation, Webster, New York, USA; Mark D. Fairchild, Munsell Color Science Laboratory, Rochester Institute of Technology, Rochester, New York, USA</td>
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</table>

**BREAK**

### Session II: Appearance Models

Session Chair: *Mark Fairchild*, Munsell Color Science Laboratory, RIT

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>10:20 am</td>
<td>CIE Work in Color Imaging</td>
<td>Alan R. Robertson, Inst. for National Measurement Standards, Nat'l. Research Council of Canada, Ottawa, Ontario, Canada; Janos Schanada, Department of Image Processing and Neurocomputing, University of Veszprem, Hungary; Todd Newman, Canon Information Systems, Cupertino, California, USA</td>
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<tr>
<td>10:45 am</td>
<td>A Comparison of CIELAB and CIECAM97s</td>
<td>Nathan Moroney, Hewlett-Packard Laboratories, Palo Alto, California, USA</td>
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<tr>
<td>11:10 am</td>
<td>Influence of Background Characteristics on Adapted White Points of CRTs</td>
<td>Peyma Oskoui, Hewlett-Packard Laboratories, Palo Alto, California, USA; Elizabeth Pirrotta, Color Science Consultant, Mountain View, California, USA</td>
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<tr>
<td>11:35 am</td>
<td>Visibility of Thin Lines on Coloured Backgrounds</td>
<td>N/A</td>
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<tr>
<td>12:00 am</td>
<td><strong>LUNCH</strong></td>
<td></td>
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</table>
Wednesday Afternoon, November 18, 1998

Session III: Reproduction Models
Session Chair: John McCann, McCann Imaging

1:30 pm  Focal Paper—Prime Colors and Color Imaging  
M. H. Brill, Sarnoff Corporation, Princeton, New Jersey, USA  
G. D. Finlayson, Univ. of Derby, Derby, UK  
P. M. Hubel, Hewlett Packard, Palo Alto, California, USA  
W. A. Thornton, Prime Color Inc., Cranford, New Jersey, USA  

1:55 pm  Experiments in Sensor Sharpening for Color Constancy  
Kobus Barnard and Brian Funt, Simon Fraser University, Burnaby, British Columbia, Canada  

2:20 pm  White-Point Preservation Enforces Positivity  
Graham D. Finlayson, The Colour & Imaging Institute,  
The University of Derby, Derby, United Kingdom  
Mark S. Drew, School of Computing Science,  
Simon Fraser University, Vancouver, British Columbia, Canada  

2:45 pm  Verification of Gamut Mapping Algorithms in CIECAM97s Using Various Printed Media  
Ján Morovic and M. Ronnier Luo, Colour & Imaging Institute,  
University of Derby, Derby, United Kingdom  

3:10 pm  Gamut Mapping: Evaluation of Chroma Clipping Techniques for Three Destination Gamuts  
Ethan D. Montag and Mark D. Fairchild, Munsell Color Science Laboratory,  
Chester F. Carlson Center for Imaging Science, Rochester Institute of Technology, Rochester, New York, USA  

3:45 pm  BREAK

Wednesday Afternoon, November 18, 1998

Session IV: Measurements
Session Chair: Danny Rich, Datacolor International

4:00 pm  NIST Reference Spectroradiometer for Color Display Calibrations  
Steven W. Brown and Yoshi Ohno, Optical Technology Division,  
National Institute of Standards and Technology, Gaithersburg, Maryland, USA  

4:25 pm  Four-Color Matrix Method for Correction of Tristimulus Colorimeters—Part 2  
Yoshi Ohno and Steven W. Brown,  
National Institute of Standards and Technology, Gaithersburg, Maryland, USA  

4:50 pm  Correcting Color-Measurement Error Caused by Stray Light in Image Scanners  
Peter A. Jansson, DuPont Company, Wilmington, Delaware, USA  
Robert P. Breault, Breault Research Organization, Tucson, Arizona, USA  

5:15 pm  Device Independent Color Measurement: Transforming Gretag Measurement Data into Simulated X-Rite Data  
David L. Spooner, rhoMetric Associates, Ltd., Wilmington, Delaware, USA  

Wednesday Evening, November 18, 1998 6:30 – 8:30 pm  
Conference Reception
Thursday Morning, November 19, 1998

Color Devices

Session V: Input
Session Chair: Ricardo Motta, Hewlett Packard Corporation

8:30 am  
**Keynote—An Eye for All Seasons**
Robert W. G. Hunt, Color Consultant, University of Derby, Derby, England

9:15 am  
**Image Noise and Colorimetric Precision in Multispectral Image Capture**
Peter D. Burns, Eastman Kodak Company, Rochester, New York, USA
Roy S. Berns, Munsell Color Science Laboratory, Chester F. Carlson Center for Imaging Science, Rochester Institute of Technology, Rochester, New York, USA

9:40 am  
**BREAK**

10:10 am  
**A Huge Spectral Characteristics Database and its Application to Color Imaging Device Design**
Johji Tajima, C&C Media Research Laboratories, NEC Corporation, Kawasaki, Japan

10:35 am  
**Recovering Device Sensitivities with Quadratic Programming**
Graham D. Finlayson and Steven Hordley, Colour & Imaging Institute, University of Derby, Derby, United Kingdom
Paul M. Hubel, Hewlett-Packard Laboratories, Hewlett-Packard Company, Palo Alto, California, USA

11:00 am  
**Dichromatic Based Photographic Modification**
Liang Peng, NVIDIA Corporation, Santa Clara, California, USA

11:25 am  
**LUNCH**

Thursday Afternoon, November 19, 1998

Session VI: Output
Session Chair: Gary Starkweather, Microsoft Corporation

1:30 pm  
**Image Quality Issues for High Resolution TFTLCDs**
Steven L. Wright, Robert W. Nywening and Steven E. Millman
IBM Watson Research Center, Yorktown Heights, New York, USA
James Larimer, NASA Ames Research Center, Moffett Field, California, USA
Jennifer Gille and Jeff Luszcz, Raytheon Systems, Ames Research Center, Moffett Field, California, USA

1:55 pm  
**Spectral-Based Ink Selection for Multiple-Ink Printing I. Colorant Estimation of Original Objects**
Di-Yuan Tzeng and Roy S. Berns, Munsell Color Science Laboratory, Chester F. Carlson Center for Imaging Science, Rochester Institute of Technology, Rochester, New York, USA

2:20 pm  
**Colorant Selection for Six-Color Lithographic Printing**
J. A. Stephen Viggiano and William J. Hoagland, RIT Research Corporation, Rochester, New York, USA

2:45 pm  
**Spectral Colour Prediction Model for a Transparent Fluorescent Ink on Paper**
Patrick Emmel and Roger David Hersch, Laboratoire de Systéms Périphériques, Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland
Thursday Afternoon, November 19, 1998
3:10 to 5:30 pm

Session VII:
The Poster Session

Session Chair: Karen Braun and Raja Balasubramanian, Xerox Corporation

The Posters will be on display throughout the day on Wednesday and Thursday.

P1 Performance Evaluation of Color Appearance Model
Shuichi Kumada, Yasushi Nakajima and Takeshi Makita, Canon Inc., Kanagawa, Japan
Hitoshi Komatsubara, Japan Color Research, Kanagawa, Japan

P2 Resiliency of the Multiscale Retinex Image Enhancement Algorithm
Zia-ur Rahman, College of William and Mary, Williamsburg, Virginia, USA
Daniel J. Jobson and Glenn A. Woodell, NASA Langley Research Center, Hampton, Virginia, USA

P3 Quality of Color Image Filtering Processes
Alain Trémeau, Philippe Colantoni and Vincent Lozano, Équipe Ingénierie de la Vision, Université Jean Monnet, Saint-Etienne, France

P4 Optimizing Color Reproduction of Natural Images

P5 Inverse of Designing Illuminants Based on Information Theory
Nobuhito Matsushiro, First Research Laboratory, Oki Data Corporation, Gunma, Japan

P6 Computer Synthesis of Spectroradiometric Images for Color Imaging Systems Analysis
Garrett M. Johnson and Mark D. Fairchild, Munsell Color Science Laboratory, Rochester Institute of Technology, Rochester, New York, USA

P7 Object-Oriented Color Matching by Image Clustering
Hiroaki Kotera, Teturo Morimoto and Ryoichi Saito, Department of Information and Image Sciences, Chiba University, Japan

P8 Gamut Mapping in Munsell Constant Hue Sections
Gabriel Marcu, Apple Computer, Cupertino, California, USA

P9 Color Gamut Mapping in a Hue-Linearized CIELAB Color Space
Gustav J. Braun and Mark D. Fairchild, Munsell Color Science Laboratory, Chester F. Carlson Center for Imaging Science, Rochester Institute of Technology, Rochester, New York, USA
Fritz Ebner, Xerox Corporation, Webster, New York, USA

P10 Gamut Mapping Algorithm Suitable for Implementation to Device Profiles
Masayoshi Shimizu, Satoshi Semba, Shoji Suzuki and Kimitaka Murashita, Fujitsu Laboratories, LTD., Atsugi City, Kanagawa, Japan

P12 Goniospectral Imaging of 3D Objects
Hideaki Haneishi, Takuya Iwanami, Norimichi Tsumura and Yoichi Miyake, Department of Information and Image Sciences, Chiba University, Chiba, Japan

P13 Independent Component Analysis of Skin Color Image
Norimichi Tsumura, Hideaki Haneishi and Yoichi Miyake, Department of Information and Image Sciences, Chiba University, Chiba, Japan
P14 Subjective Evaluation on Printed Paper for Reflective LCD
Ken-ichi Iwauchi, Terutaka Tokumaru and Yoshiyuki Higashigaki,
Functional Devices Research Laboratories, Sharp Corporation, Japan

P15 Halftone Color: Diffusion of Light within Paper
Geoffrey L. Rogers, Fashion Institute of Technology, New York City, New York, USA

P16 Color Separation for Four Color Printing
Werner Praefcke, Institut für Elektrische Nachrichtentechnik,
Aachen University of Technology (RWTH), Aachen, Germany

P17 Colour Printer Characterization by Regression with Greyspace Constraint
Mark S. Drew, School of Computing Science, Simon Fraser University, Vancouver, B.C., Canada
Graham D. Finlayson, M. Ronnier Luo and Ján Morovic,
The Colour & Imaging Institute, The University of Derby, Derby, United Kingdom

P18 An Iterative Cellular YNSN Method for Color Printer Characterization
A. Ufuk Agar and Jan P. Allebach, School of Electrical and Computer Engineering,
Purdue University, West Lafayette, Indiana, USA

P19 High Precision Color Management by Polor Coordinate Division in CIELAB Space
Atsumi Ishige, Hiroaki Kotera and Chen Hung-Shing,
Department of Information and Image Sciences, Chiba University, Chiba, Japan

P20 Coding Colour Quantized Images by Local Colour Quantization
G. Qiu, School of Computing & Mathematics, University of Derby, Derby, United Kingdom

P21 Digital Color Quantization Patterns in CIE Spaces and Artifacts from Misaligned Color Planes
Keith Godfrey, Department of Electrical and Electronic Engineering,
The University of Western Australia, Australia

Thursday Evening, November 19, 1998, 7:30 – 9:30 pm

Panel Discussion—Color Standards
Moderator: Robert Hunt
Panelists: Tim Kohler, ICC; Alan Robertson, CIE; Tony Johnson, ISO; Hiroaki Ikeda, IEC
Recorder: David Q. McDowell, Eastman Kodak Company

Friday Morning, November 20, 1998

Color Communications

Session VIII: Encoding
Session Chair: Rob Buckley, Xerox Corporation

8:30 am Keynote—Is Mars Really Red? Color Imaging from Mars Pathfinder
Peter H. Smith, Lunar and Planetary Lab., University of Arizona, USA

* paper not available at time of publication
9:15 am  **Overcoming Gamut and Dynamic Range Limitations in Digital Images**
*Gregory Ward Larson*, Silicon Graphics, Inc., Mountain View, California, USA  

9:40 am  **BREAK**

10:10 am  **DjVu: A Compression Method for Distributing Scanned Documents in Color over the Internet**
*Yann LeCun, Léon Bottou, Patrick Haffner and Paul G. Howard*, AT&T Labs-Research, Red Bank, New Jersey, USA  

10:35 am  **High-Resolution Multi-Spectral Image Archives: A Hybrid Approach**
*Francisco H. Imai and Roy S. Berns*, Munsell Color Science Laboratory, Chester F. Carlson Center for Imaging Science, Rochester Institute of Technology, Rochester, New York, USA  

11:00 am  **The Story of a Color Advisor**
*Larry Lavendel*, Ikitomi Design, Aptos, California, USA  
*Tim Kohler*, Canon Information Systems, Cupertino, California, USA  

11:25 am  **LUNCH**

**Friday Afternoon, November 20, 1998**

**Session IX: Processing**
Session Chair: *Graham Finlayson*, Colour & Imaging Institute, University of Derby (UK)

1:30 pm  **Focal Paper—The Colors of the Stars**
*Thor Olson*, Management Graphics Inc., Minneapolis, Minnesota, USA  

1:55 pm  **Reconstruction of Colour Images Containing Subsampled Chrominance Information by Pattern Mapping**
*G. Qiu*, School of Computing & Mathematics, University of Derby, Derby, United Kingdom  

2:20 pm  **Window-Extent Tradeoffs in Inverse Dithering**
*Shiufun Cheung and Robert A. Ulichney*, Compaq Computer Corporation, Cambridge Research Laboratory, Cambridge, Massachusetts, USA  

2:45 pm  **BREAK**

**Friday Afternoon, November 20, 1998**

**Session X: Color Management**
Session Chair: *Naoya Katoh*, Sony Corporation

3:15 pm  **On the Desktop Color System Implied by the ICC Standard**
*James C. King*, Adobe Systems Incorporated, San Jose, California, USA  

3:40 pm  **The Creation of the sRGB ICC Profile**
*Mary Nielsen and Michael Stokes*, Hewlett-Packard Company, Boise, Idaho, USA  

4:05 pm  **Color Fidelity Test Methods**
*Michael Stokes*, Hewlett-Packard Company, Boise, Idaho, USA  
*Tom White*, Microsoft Corporation, Redmond, Washington, USA