



David R. Wyble
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EMPLOYMENT AND EXPERIENCE

President, Avian Rochester, LLC, Rochester NY.
June 2010 to present.

Responsibilities include:

- Coordinate technical projects across Avian Rochester product offerings including: color and fluorescent standards; color measurement techniques; camera and imaging characterization.
- Manage consulting activities including: custom color measurement; product measurements and comparisons; color dispute verification and resolution; general legal and patent efforts.
- Interface with customers: definition of requirement; preparation of quotations; report generation; billing; and follow-up.
- Maintain measurement capabilities to facilitate the needs defined by product lines and customers.

A detailed list of past projects are described at <www.avianrochester.com/solutions.php>

Director of Color Science, Avian Technologies LLC, New London, New Hampshire
November 2006 to present.

Responsibilities include:

- Act as technical expert for color, colorimetry, and goniospectrophotometry, as well as the related material standards and instrumentation.
- Perform certified measurements; interact with customers to align requirements with measurement procedures; create formal measurement certifications; document procedures.
- Engage in customer outreach via: conference attendance and participation; blog postings; and exhibitions.
- Technical product manager for color reference standards, fluorescent whiteness standards, and color measurement instrumentation.

Senior Scientist, FluxData Inc, Rochester NY.
September 2012 to December 2017.

Responsibilities included:

- Product development and engineering support for color science and imaging product lines.
- Special projects related to color imaging and color measurement.
- These responsibilities are ongoing on a consultation basis.

Color Scientist, Munsell Color Science Laboratory, Rochester Institute of Technology.
January 1997 to December 2012. (part time January 2013 - present)

Responsibilities included:

- Performing independent research. The research focus was generally related to device characterization and instrumentation for color measurement (publications listed below).
- Maintaining technical competence in the fields of color science and color imaging. This requires attending at least one conference per year, and various local classes and seminars relating to color and imaging.
- Teaching and providing educational support. This included teaching short industrial courses and undergraduate and graduate classes, as well as the development of these materials. Development and teaching

of for-credit college coursework included: undergraduate Imaging Science course, *Programming for Imaging Science*; and its follow-on, *Programming for Imaging Science II*; as well as graduate Imaging Science *Programming for Imaging Scientists*; and the graduate Color Science course *Color Measurement Laboratory I*.

Member, Research and Technology Staff, Wilson Center for Research and Technology, Xerox Corporation
May, 1992 to December 1996.

Responsibilities included:

- Performing modeling and simulation of color electrophotographic systems. This included interacting with product development personnel and properly designing both virtual and hardware testing procedures. The goal was prediction of various image quality properties of color printers.
- Implementing the halftoning input subsystem to the overall system model. This involved collaborating with the image processing team and incorporating their halftoning algorithms into the system model.
- Porting large legacy simulation environment (30K lines of FORTRAN) and accompanying subsystem models. The modeling environment and subsystem models were interfaced and then implemented on a modern operating system (SunOS Unix).
- Mentoring of new hire modeling team members. This included training in use of the system models as well as assisting them in becoming productive subsystem or system modelers on their own.

EDUCATION

Ph.D. Color Science, Chiba University, Chiba, Japan, 2007.

Dissertation title: *Color Measurement for Device Characterization*.

MS Color Science, Rochester Institute of Technology, 1998.

Master's project: *A Critical Review of Spectral Models Applied to Binary Color Printing*.

BS Computer Science, SUNY Brockport, 1992.

PUBLICATIONS, TECHNICAL REPORTS, AND PRESENTATIONS

Wyble, D.R., Capabilities and Benefits of Controllable LED Illumination, *TAGA's Annual Technical Conference*, Baltimore MD (2018).

Wyble, D.R., Use of Multi-LED Illumination Systems, What can I do? What can't I do?, *SPECAD RETAC® 2017, Milwaukee WI* (2017).

Wyble, D.R., Dependence of Bidirectional Instrument Performance on Sample BRDF Properties, *ISCC/CORM Joint Conference*, Troy, NY (2017).

Wyble, D.R., Next Generation Camera Calibration Calibration Target for Archiving, *IS&T Archiving 2017*, Riga, Latvia (2017).

Wyble, D.R.; Seymour, J., Investigation of the Implementation Aspects of the M1 Condition, *67th Annual Meeting of the Technical Association for the Graphic Arts*, Albuquerque, NM, March, 2015.

Nadal, M.E.; Wyble, D.R.; Zarobila, C.J., Book chapter: "Color and Appearance," *Spectrophotometry: Accurate Measurement of Optical Properties of Materials*, Edited by Germer T.A.; Zwinkels, J.C.; Tsai, B.K. Elsevier (2015).

Hensley, B; Wyble, D.R., Spectral Imaging Using a Liquid Crystal Tunable Filter, *prepared for Andrew W. Mellon Foundation, Rochester Institute, College of Science, Center for Imaging Science, Munsell Color Science Laboratory, Rochester, New York, United States* (2013).

Berns, R.S.; Chen, T.; Wyble, D.R.; Chen, L., Practical Total Appearance Imaging of Paintings, *IS&T, Archiving Conference, Copenhagen, Denmark, June* (2012)

Fairchild, M.D.; Wyble, D.R., hdr-CIELAB and hdr-IPT: Simple Models for Describing the Color of High-Dynamic-Range and Wide-Color-Gamut Images, *IS&T/SID, IS&T/SID Color Imaging Conference, Albuquerque, New Mexico, United States* (2010)

Wyble, D.R.; Kehren, K.; Urban, P.; Dörsam, E., Repeatability analysis of multiangle spectrophotometers, *Joint Meeting of ISCC/ASTM E12/CIE Div. 1*, Princeton University, June 14 – 18, 2010.

- Wyble, David R.; Berns, Roy S., Validating the Accuracy of the MCSL Imaging Goniospectrometer, *prepared for The Andrew W. Mellon Foundation, Rochester Institute of Technology, College of Science, Center for Imaging Science, Munsell Color Science Laboratory, Rochester, New York, United States* (January 2010)
- Wyble, David R., Fluorescent Excitation from White LEDs, *Council for Optical Radiation Measurements, Council of Optical Radiation Measurements Annual Meeting, Troy, New York, USA* (2008)
- Fairchild, M.D.; Wyble, D.R.; Johnson, G.M., Matching image color from different cameras, *IS&T/SPIE Symposium on Electronic Imaging: Science and Technology, San Jose, California* (2008)
- Wyble, David R., Book chapter: "Color Measurement," *The Focal Encyclopedia of Photography, Fourth Edition Ed., Elsevier, Amsterdam, Limburg, Netherlands* (2007)
- Wyble, David R.; Brill, Michael H.; Rich, Danny C.; Fortini, Peter, Considerations and Shortfalls of Instrument Evaluation Using ASTM E2214, *ISCC, Inter-Society Color Council Annual Meeting, Kansas City, Missouri, United States* (April 2007)
- Fairchild, M.D.; Wyble, D.R., Mean Observer Metamerism and the Selection of Display Primaries, *IS&T's 15th Color Imaging Conference, Albuquerque, New Mexico, pp. 151-156* (2007).
- Wyble, D.R.; Rich, D.C., Evaluation of Methods for Verifying the Performance of Color-Measuring Instruments. Part I: Repeatability, *Color Research and Application*, **32**, 116-175 (2007).
- Wyble, D.R.; Rich, D.C., Evaluation of Methods for Verifying the Performance of Color-Measuring Instruments. Part II: Inter-Instrument Reproducibility, *Color Research and Application*, **32**, 176-194 (2007).
- Wyble, David R., Comparison of Methods for Verifying the Accuracy of Color Measuring Instruments, *ISCC, Inter-Society Color Council Annual Meeting, Ottawa, Ontario, Canada* (2006)
- Wyble, David R.; Rich, Danny C., Comparison of Repeatability Metrics for Color Measurement Instruments, *ISCC, ISCC Special Topics Conference on Precision and Accuracy in the Determination of Color Images, Scottsdale, Arizona, USA* (November 2005)
- Rich, Danny C.; Wyble, David R., Comparison of Reproducibility Metrics for Color Measurement Instruments, *ISCC, ISCC Special Topics Conference on Precision and Accuracy in the Determination of Color Images, Scottsdale, Arizona, USA* (November 2005)
- Reprint of H.E.J. Neugebauer, The Theoretical Basis of Multicolor Letterpress Printing, Commentary by M.Pearson, Translation by Wyble, D.R., Kraushaar, A., *Color Research & Application* **30**, 322-331, (2005).
- D.R. Wyble, M.R. Rosen, Color Management of Four-Primary DLP Projectors, *Journal of Imaging Science & Technology* **50**, pp. 17-24, (2005).
- Heckaman, R.L.; Fairchild, M.D.; Wyble, D.R., The Effect of DLP Projector White Channel on Perceptual Gamut, *Thirteenth Color Imaging Conference, Scottsdale, Arizona, pp. 205-210* (2005).
- D.R. Wyble, Long-Term Data Projector Color Performance Test, white paper written for Texas Instruments, (2004).
- D.R. Wyble and H. Zhang, Colorimetric Characterization Model for DLP Projectors, *IS&T's 11th Color Imaging Conference, Scottsdale*, 346-350 (2003).
- D.R. Wyble and J.L. Laird, Precision and Accuracy of Commercial Spectrophotometers, *ISCC's Symposium on Color & Appearance Instrumentation, Chicago*, (2003).
- F.H. Imai, D.R. Wyble, R.S. Berns, D.-Y. Tzeng, A Feasibility Study of Spectral Color Reproduction, *Journal of Imaging Science & Technology Tech* **47**, 549-559 (2003).
- D.R. Wyble, Analysis of Spectrophotometer Specular Performance Using Goniophotometric Information, *Fourth Oxford Conference on Spectrometry, Davidson College, Davidson, NC, Proc. SPIE* **4826** 98-103 (2002).

F. Imai, M. Rosen, D. Wyble, R. Berns and D. Tzeng, Spectral reproduction from scene to hardcopy I: Input and Output, *Proc SPIE* **4306**, 346-357 (2001).

D.R. Wyble and M.D. Fairchild, Prediction of Munsell Appearance Scales Using Various Color Appearance Models, *Color Research & Application* **25**, 132-145 (2000).

D.R. Wyble and R.S. Berns, A Critical Review of Spectral Models Applied to Binary Color Printing, *Color Research & Application* **25**, 4-19 (2000).

D.R. Wyble and M.R. Rosen, Color Management of DLP Projectors, *IS&T's 12th Color Imaging Conference*, Scottsdale, 228-232 (2004).

M.R. Rosen, M.D. Fairchild, G.M. Johnson, D.R. Wyble, Color Management within a Spectral Image Visualization Tool, *IS&T's 8th Color Imaging Conference*, Scottsdale, AZ, November 2000.

D.R. Wyble and M.D. Fairchild, Quantitative Evaluation of Color Appearance Models Using the Munsell Renotation Data, Inter-Society Color Council 67th Annual Meeting, October 2-5, 1998, Baltimore, MD.

M.D. Fairchild and D.R. Wyble, Colorimetric Characterization of the Apple Studio Display (Flat Panel LCD), Munsell Color Science Laboratory Technical Report, July 1998.

PROFESSIONAL MEMBERSHIPS AND ACTIVITIES

Member, Society for Imaging Science and Technology (IS&T).

Member, Inter-Society Color Council (ISCC).

Member, Council of Optical Radiation Measurements (CORM).

Member, ASTM.

Member, Board of Directors, Inter-Society Color Council 2009-2012, 2014-present.

Chair, Web Committee, Inter-Society Color Council, 1998-present.

General Chair, Inter-Society Color Council Annual Meeting, November 2016.

Conference Committee, Inter-Society Color Council Annual Meeting, October 2012.

Technical Co-chair, ISCC/CORM Joint Meeting *Lighting in Art, Commercial, and Retail Spaces*, March 2010

General Chair, Inter-Society Color Council Annual Meeting, June 2009.

Session Chair, CORM 2004: *Advances in Color and Appearance Metrology*, May 2004.

Publicity Chair, International Colour Association 2001 Quadrennial Congress: *AIC 2001 Rochester*.

Short Course instructor, *IS&T Archiving Conference*, 2017.

Short Course instructor, *IS&T Color and Imaging Conference*, various years 2007-present.

AWARDS AND PATENTS GRANTED

B.E. Thayer, D.R. Wyble, U.S Patent #4,819,031, *Rotating Vane for toner transport for blade cleaning on horizontal surfaces*, (1989)

M.A. Gwaltney, D.R. Wyble, U.S Patent #5,867,198, *Method for estimation of toner usage in digital xerographic copiers and printers*, (1999)

Nickerson Service Award (2007) awarded by the Inter-Society Color Council

CONSULTING AND OTHER PROFESSIONAL ACTIVITIES

Many of my previous projects are described on my company website "Solutions" page:

www.avianrochester.com/solutions.php

These are fields in which I have been engaged in consulting and/or expert services:

- Projector color analysis (patent defense)
- Custom color measurement analysis and services (patent defense and analysis)
- Display analysis and characterization (patent analysis)
- Color measurements in the field (trademark protection)
- Color measurement instrument analysis
- Custom color formulation
- ...and much more