



The Chroma Zone



Munsell Color Science Laboratory

Spring 1997

The Lab Welcomes a New Member to Our Staff

Dave Wyble joined the laboratory staff as a color scientist as of January 2, 1997. Dave comes to us with a background in computer science after spending several years with Xerox. He has also been a part-time student in our Color Science program and we expect him to complete his M.S. degree this summer. As a color scientist on our staff, Dave will be responsible for helping faculty and students with research problems, managing our SGI systems, and performing some research. We are all very excited to have Dave on board and extend him a warm welcome. Directly below Dave describes, in his own words, what he hopes to accomplish at MCSL.

- Mark D. Fairchild, Director

Introducing... I joined the Munsell Lab after about 15 years in research and engineering at Xerox Corp. My responsibilities at Xerox centered around modeling and simulation of the xerographic process. On the side, I completed my BS in Computer Science part-time, and soon thereafter entered the MS Color Science program here at RIT, also on a part-time basis.

Dave Wyble

My new position in the Munsell Lab continues to evolve. So far, most of my activities center around my computer expertise. Until I finish my MS degree, I will need to focus on my personal research, but after that I hope to work towards heavier involvement in the color research done in the Lab. So far, everyone I have worked with has made me feel welcome, and very much at home. I look forward to interfacing with all the faculty, staff, and students in the Munsell Lab and the greater RIT community.

- Dave Wyble

MCSL Annual Industrial Short Courses

Color Measurement and Formulation

Principles of Industrial Color Measurement
June 16-18, 1997

Industrial Instrumental Color Matching
June 19, 1997

Foundations of Color Management Systems

Colorimetry
June 23, 1997

Device Characterization
June 24-25, 1997

Color Appearance Models
June 26-27, 1997

For More Information: Call 716-475-7189

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Mark's Upcoming Sabbatical at Cornell University

As most of you probably know by now, I will be spending the 1997-98 academic year (and most of the 1997 and 1998 summers) on sabbatical leave at Cornell University. I will be doing research with Professor Donald P. Greenberg at Cornell's Program of Computer Graphics. The Program of Computer Graphics is widely recognized as one of the leaders in computer graphics, particularly in the synthesis of realistic, spectroradiometrically-correct images. While the very nature of research makes it difficult to precisely predict my activities, this article provides a brief overview of some of my plans.

There are three main initiatives I plan to undertake while at Cornell. These are (1) collaboration on ongoing Cornell research, (2) completion of a Kodak-sponsored research project, and (3) strategic planning of future research directions and collaboration. (The fourth, unwritten, objective is to spend a little more time working on my golf game.)

Areas of Interest

The image rendering techniques being developed at Cornell are extremely computationally complex. This is because they strive to model the spatial, geometric, and spectral interactions between light sources and objects in a physically accurate way. Since the light reflected from various objects interacts with other objects, the solutions are necessarily iterative. One important question to be addressed is the establishment of image error metrics that can be used to decide when to cease iterations such that no further improvement in the image could be perceived. Another area of interest is the development of techniques to render the full spectroradiometric image data onto various display devices while preserving the color appearance of the rendered scene for different types of viewing conditions. Lastly, such image rendering techniques require full goniospectrophotometric data for objects resulting in a significant measurement effort at Cornell. These issues clearly overlap the work we have done at MCSL on color difference metrics, image quality psychophysics, color appearance modeling, and goniospectrophotometry. I expect little difficulty finding areas in which I can contribute to the ongoing projects at Cornell.

Funding

Partial funding for this leave is coming from Eastman Kodak through a joint project examining the use of computer graphics techniques to produce test images for imaging system simulations. This work will be carried out as Garrett Johnson's Color Science M.S. thesis. Garrett will be joining me at Cornell to work with me on this project and perhaps others. Our plan is to build a system based on the OpenGL graphics library (and thus portable to a variety of computer systems). This system will be capable of rendering high resolution (both spatial and radiometric) color images with full spectral radiance information at each pixel. Some features we plan to include are spectral texture mapping and modeling of fluorescence, observer metamerism, and illuminant metamerism. Also the development of techniques to render the spectral images to various displays will be of interest for visual demonstrations.

The last major area is the development of plans for future research projects and ongoing collaboration with Cornell. I hope to learn more about the various processes of computer image synthesis to apply them as a tool in future color appearance and color imaging research. For example, we should be able to develop more realistic stimuli that vary in time and three-dimensional space for future perceptual experiments on color appearance and color discrimination. These techniques might also lead toward the development of an overall image quality metric — something that is often requested in imaging science. Other possibilities include the development of colorimetric image processing and rendering techniques, gamut mapping algorithms, image representations, error metrics, and improved goniospectrophotometric techniques.

Web Address

Clearly, there will be plenty of interesting challenges to keep me busy while I'm away from RIT. I am very excited about my upcoming year at Cornell and am looking forward to returning to MCSL in 1998 with a refreshed set of ideas for both research and the future direction of the laboratory. You can find more information about Cornell's Program of Computer Graphics by checking out the link on my world-wide web page at <http://www.cis.rit.edu/people/faculty/fairchild>.

-Mark D. Fairchild

What would you like to read about?

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