



The Chroma Zone

Munsell Color Science Laboratory Newsletter

Summer 1995

Student News

Congratulations to this spring's three Color Science Master of Science graduates. Rick Alvin is now employed at Eastman Kodak Company; his thesis topic was *A Computational Analysis of Observer Metamerism in Cross-Media Color Matching*. Christopher Hauf is also employed at Eastman Kodak Company; his thesis topic was *Device Independent Color Modules for Silicon Graphics Iris Explorer*. Seth Ansell is now employed at Hewlett Packard Company, Vancouver, WA; his thesis topic was *Colorimetric and Spatial Analysis of Textured Materials*. A couple of our previous graduates, Nathan Moroney and Elizabeth Pirrotta, have recently accepted positions at the Hewlett Packard Company in Barcelona, Spain. They moved at the end of July.

On the other end of the spectrum, I would like to welcome several new full and part time students into our program. We have 4 full time students: Scott Bennett, Min Guo, Animesh Bose, and Tuo Wu and 1 new part time student: David Wyble.

Good Luck to you all.

Color Short Courses a Success

Attendance numbers soared this year; we had 41 participants in our Principles of Industrial Color Measurement Course. We haven't seen numbers above 30 for the past two years. Some companies included: Hewlett Packard, Monsanto, Xerox, and DuPont. The course ran smoothly in the Center's auditorium and the participants got a chance to see the Munsell Lab, mingle with our students and enjoy some drinks and hors d'oeuvres at the reception.

This year we offered a new one-day course, Industrial Instrumental Color Matching, taught by Ralph Stanziola. There were 33 participants in attendance. Some companies included: ColorTec Associates, Benjamin Moore and Plasticolors. Course comments were very complimentary. Ralph's extensive practical experience was appreciated. We will be giving this course again next year.

The advanced courses offered the following week were well received also. Both the Device-Independent Color Imaging and Color-Appearance Models: Theory and Practice were filled with 24 and 20 participants respectively. Some companies included: Eastman Kodak, Hewlett Packard, IBM, and Xerox.

When Roy's Not Working He's...



As some of you might recall, Roy made his color science musical debut at the Princeton ISCC/AIC meeting several years ago. Because of all the encouragement, he joined a jazz trio, The Steve Greene Trio. They have released their debut CD, *Acoustic Living*. It features the sound of the carved-top acoustic guitar developed in the 1930's and used during the swing era in big bands. Since the recording was entirely digital, Roy learned about the audio equivalent of quantization artifacts, signal to noise, and nonlinear processing. Some of the songs include: *Moonlight in Vermont*, *Yesterdays*, *Giant Steps*, *Song for my Father*, and *Nuages*. For more information or to purchase a CD or cassette tape, contact Roy (716-475-2230 rsbpph@rit.edu)

Device Independent Color Imaging Modules for IRIS Explorer Master of Color Science Thesis Research

Development is currently underway to bring a new set of tools for doing device independent color imaging to the Munsell Color Science Lab. For my thesis research, I have been authoring modules for IRIS Explorer, a module based imaging and rendering package native to the Silicon Graphics family of UNIX workstations. The tools I am building for Explorer will allow users to interactively work with their images in a device independent sense.

IRIS Explorer allows a user to build maps through which their images are processed. At each node in the map is a module that performs a task on that image whether it is reading it from disk, running an algorithm on it, or displaying it to the screen. This can be all done interactively or through Explorer's scripting language for the offline processing of large or multiple images. Thus, a user has a great deal of flexibility in how they work with their images.

Specific to my research, I have been developing a set of modules related to device independent color imaging. These include modules to do certain device models such as the Berns et al. Gain-Offset-Gamma CRT model, modules to do different color appearance models such as RLAB and the Hunt color appearance model, modules to change to different color spaces such as CIELAB and CIELCh, modules to do different image processing tasks such as scaling and 1-D LUTS, modules to perform gamut mapping, and modules which in conjunction with all the others will take advantage of the Barco Chameleon Accelerator which is installed in one of MCSL's SGI workstations.

The Barco Chameleon Accelerator board is a piece of hardware that allows for 3-D LUT interpolation at rates as great as 10 million pixels/second. In conjunction with RIT Research Corporation and Barco who generously supplied us the board, we have been working toward a set of modules that will allow us to build through my other modules large 3-D LUTS which could then be used for fast image processing.

My thesis is entering its final stages of development this fall, so that the tools may be used in current and new research and as teaching tools for some of the classes taught at the Munsell Color Science Lab. At this time, I would like to thank my advisor, Mark Fairchild, for all of his help, support, and encouragement, as well as Roy Berns, Lisa Reniff, and all of the other members and students of the Munsell Lab for their support and encouragement.

- Christopher Hauf

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