

W1.1 Image Quality of Printers

W1.1 2002 – 036

Color Rendition

R. E. Cookingham

July 24, 2002

Color Rendition Ad Hoc Group Teleconference Notes 7/24/02

Present: Bob Cookingham, Eddy Dalal, Sue Farnand, Bill Kress,
Oscar Martinez, and Karin Topfer

Next Teleconferences: 2nd and 4th Wednesdays @ Noon EDT: 8/28

Bill Kress walked us through the scanner characterization work that he has been doing with the macro-uniformity and micro-uniformity teams. He has managed to achieve pretty good calibration for most colors with the exception of some darker colors. The next step he is undertaking is to quantify the accuracy of the scan by looking at the ΔE values. The ΔE -2000 was suggested as a metric to use. Sue will see if she can share her matlab version of the code necessary to generate the ΔE -2000 values.

The steps listed below are the steps Bill is using the his proposed calibration procedure. Karin and Oscar were going to try to follow this procedure to calibrate scanners using photographic and ink jet renditions of the color test targets respectively.

Summary of steps used for scanner characterization

1. Print scanner characterization target (SCT) at same settings as image quality test.
2. Digital-capture (e.g., scanner) of SCT and save as TIFF image. If you want to train using SCT and test using another check file, print and digital-capture the check file in the same way.
3. GretagMacbeth ProfileMaker 4.0 with Spectrolino Spectroscan: Measure Tool -> Chart -> Custom -> Number Patches, Patches/strip (vert). This generates a text file of ICC format that will be read by the characterization program. If you want to train using SCT and check using another file, measure the check file in the same way.
4. Orient (i.e., rotate in Photoshop) TIFF image of SCT the same as measurement.
5. GretagMacbeth ProfileMaker 4.0 to generate the profile. Reference is the SCT text file. Sample is the SCT TIFF image.
6. Use Photoshop (I use 7.0) and read in the RGB TIFF file from scanner. Color settings: ACE, Absolute Colorimetric.
7. Assign profile from step 5.
8. Image -> Mode -> LAB Color and save the LAB image.
9. Matlab analysis.

Eddy compared the sCIELAB plot Karin generated for the DC12 sky to white scan to the actual rendered images, which he has, to see how well he assess the metric has identified the contours present in that sweep image. His assessment was that it appears the metric Karin used is not

sensitive enough in its present form to identify all the contours. It did identify the three most obvious contours, but it was unable to clearly identify the contours that are near threshold. Thus although we could use it to find the largest contours we could not be sure we were able to identify all contours that were visible. We debated the use of multiple narrower scans as a means of driving down the noise level to see if we could generate a more definite signal.

We discussed the scanner targets that the Macro-uniformity committee has been developing. Our initial reaction to the targets was that they would serve to calibrate scanners for color rendition providing that there was a test or procedure to insure continuity in transition from one color to the next. This is reflective of the importance tonescale in good color rendition. Bob will contact Rene Rasmussen to request a low resolution TIFF file of the scanner targets and share the concern over continuity.

Action Items:

1. Bill will continue the ΔE analysis of the charts to evaluate the efficacy of the scanner calibration technique and bring us up to date on his findings at the next teleconference
2. Eddy indicated he would try to scan the DC-12 sky to white several times to see if it was possible to drive down the noise level through the use of multiple narrower scans.
3. Bob will contact Rene Rasmussen and request a low resolution TIFF file of the scanner targets so it can easily be read into Photoshop, printed and measured.
4. Karin and Oscar will try to following Bill's procedure outlined above to calibrate scanners using photographic and ink jet renditions of the color test targets respectively.

Addresses: These are the current addresses of the Color Rendition ad hoc committee members

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The next teleconference will be on Wednesday, August 28, 2002 at Noon EDT.