Using ArgyllCMS to Profile RGB Printers

The Argyll Color Management System developed by Graeme Gill is a powerful set of software tools that can be used to profile photographic printers and monitors. The source code and executables for various computer operating systems are at: http://www.argyllcms.com/index.html Included on the website are instructions for use, a tutorial on color management, and drivers for various spectrophotometers that need to be installed so that the instruments can be used. The various Argyll programs are executed through the computer's command line and users need to have a degree of familiarity in launching programs from the command line.

One level of frustration can be reduced by using a simple text editor (Notepad, that comes bundled with the Windows OS) to type in and save commands. The commands can be copied and pasted into the command prompt and launched by hitting the <ENTER> key. Only certain parts of each command that I outline below need to be modified, and once you have set up a list of commands your workflow will be much easier. Since I utilize a separate program for profiling my monitor, the following discussion only covers the profiling of simple RGB printers. A graphical user interface (GUI) has been developed that uses Argyll to profile monitors and interested users are referred here: https://displaycal.net/

My approach to using ArgyllCMS is outlined in the following sections. The first is for a simple one step approach to preparing a profile. The second uses a two stage process where a preliminary profile is prepared and then that one is used to generate a more refined profile by focusing on near neutral colors. I also include a 51 step black/white patch set that is useful for those using the profile for monochrome prints. Because ArgyllCMS can be configured in many different ways, the approach outlined below should be looked at as a starting point to refine your printing process. For many RGB printers the **A** approach will work just fine. In most cases your profiles will be better than those supplied by the paper manufacturer.

A. One Step Profile Generation

1. Target Generation

targen –v –d2 –G –g51 –f[# patches to be read] PrinterA *(It is best to give the name as #patches_testchart output is a *.ti1 file that includes 51 gray step patches;* ***1848*** *is 4 pages for the i1 pro)*

2. Create Target for Printing (note that this command is for an i1 Pro spectro; if you are using a different instrument you need to change the second command. You also have to print out the target **without** color management. Most photography software won't allow this and you will need to use a utility such as the Adobe Color Print Utility: https://helpx.adobe.com/photoshop/kb/no-color-management-option-missing.html that can be used to print out your targets.)

printtarg –v –ii1 –t200 –pLetter PrinterA *(this creates one or more TIF files that can be printed out for reading. Each Letter sized page contains 22 rows of 21 patches printed at 200dpi. The*

*information on the chart set is contained in a *.ti2 file.* ***This file must be renamed for further work in reading the chart and creating the profile****)*

3. **Read Test Chart**

   Chartread –v –L -n PrinterA *(As noted, the *.ti2 file must be renamed so that there won't be any files overwritten with subsequent tool use. –L gives you LAB data, -n suppresses spectral data. To get better precision, it is useful to do two sets of patch readings and then average them together. If we are profiling Ilford Gold Fiber Silk a convenient naming convention would be* ***PrinterA -> IFGS_1.ti2*** *for the first reading which will result in* ***IGFS_1.ti3.*** *Rename the *.ti2 file to:* ***IFGS_2.ti2*** *so that you get the second patch data set. If you have only partially read a chart set, use the* ***–r*** *flag to return to a partially read set.* ***Also use this setting for going back and rereading a specific row.***

   3.a Average the two Data Sets (I routinely do two reads of the charts and then average them)

   Average –v input1.ti3 input2.ti3 output.ti3

4. **Create the Profile**

   colprof –v –A"Mfr" –M"model" –D"profile description" –q[mh] –SAdobeRGB1998.icc –cmt –dpp –O*profile_name.icm* name(ti3 file) *(make sure to keep the illuminant as the default, D50 so you don't get the blue cast in PS. Use the* ***–q*** *setting of* ***'h'*** *only when making the final profile. The default is* ***–qm****. Always use the* ***–O*** *switch to name the profile and give it the .icm extension.*

   Here is an example of a profile creating command that I would use for an Epson 3880 printer and Ilford Gold Fibre Silk paper:

   colprof -v -A"Epson" -M"3880" -D"IGFS" -qm -SAdobeRGB1998.icc -cmt -dpp –O IGFS_tst3.icm i1_igfs

5. **Check the Profile and Print out Log**

   profcheck –v2 –k –w name.ti3 profile.icm >logfile.log *(This will generate a table that can be exported into Excel to find out which patches had a large error allowing for possible re-reading. It will also create file for VRML visualization.)*

Settings for chartread to compare papers (*optional)*

Chartread –v –n –L Ti3FileName (Saves LAB and XYZ data but not spectral data)

B. Two Stage Workflow With Preconditioning Profile

1. Target Generation

targen –v –d2 –G –f[924] PrinterA *(Prints out two pages of general patch targets to create a preliminary profile. Read and create the first profile using steps B.2 – B.4. Use this profile in **Step 1.a**)*

1.a. Use the Precondition Profile to Generate a New Set of Patches

Targen –v –d2 –G -cPreCondProfile –s51 –N0.6 f1848 PrinterA (*It is best to give the name as #patches_testchart output is a *.ti1 file file includes 51 gray step patches; N command highlights the neutral axis **1848** is 4 pages for the i1 pro)*

2. Create Target for Printing

printtarg –v –ii1 –t200 –pLetter PrinterA *(this creates one or more TIF files that can be printed out for reading. Each Letter sized page contains 22 rows of 21 patches printed at 200dpi. The information on the chart set is contained in a *.ti2 file. **This file must be renamed for further work in reading the chart and creating the profile**)*

3. Read Test Chart

Chartread –v –L PrinterA *(As noted, the *.ti2 file must be renamed so that there won't be any files overwritten with subsequent tool use. –L gives you LAB data. To get better precision, it is useful to do two sets of patch readings and then average them together. If we are profiling Ilford Gold Fiber Silk a convenient naming convention would be **PrinterA -> IFGS_1.ti2** for the first reading which will result in **IGFS_1.ti3.** Rename the *.ti2 file to: **IFGS_2.ti2** so that you get the second patch data set. If you have only partially read a chart set, use the **–r** flag to return to a partially read set. **Also use this setting for going back and rereading a specific row.***

Chartread –v –l -n PrinterA *(This setting should be used for reading ABW 51 step charts. Output is LAB value. –n flag deletes the spectral readings.)*

3.a Average the two Data Sets

Average –v input1.ti3 input2.ti3 output.ti3

4. Create the Profile

colprof –v –A"Mfr" –M"model" –D"profile description" –q[mh] –SAdobeRGB1998.icc –cmt –dpp –O*profile_name.icm* name(ti3 file) *(make sure to keep the illuminant as the default, D50 so you don't get the blue cast in PS. Use the **–q** setting of **'h'** only when making the final profile. The default is **–qm**. Always use the **–O** switch to name the profile and give it the .icm extension.*

colprof -v -A"Epson" -M"3880" -D"IGFS" -qm -SAdobeRGB1998.icc -cmt -dpp –O IGFS_tst3.icm i1_igfs