SCSH Camera Club

December 17, 2015 Workshop Meeting

Calibrating Monitors

Meeting Agenda

- Types of Monitors
  - TN
  - MVA
  - IPS
- Calibration Devices
  - X-rite i1 Display Pro
  - X-rite Color Munki
  - DataColor Spyder 5
  - Other models
- Calibrating
  - Purpose
    - Screen views only
    - Matching Prints
      - Print Viewing Booth or Light
  - Consistent Ambient Light
  - Calibration Targets
    - Brightness
    - Color Temperature
    - Gamma
    - Contrast
    - Iterate, if necessary, until purpose is achieved

Types of Monitors

- TN: Twisted Nematic
  - Cheapest
  - Fast response times (no ghosting)
  - Worst color reproduction (6-bit colors, 8-bit simulated via dithering)
  - Color/brightness shifts when viewing off-angle
- VA (Vertical Alignment), e.g., S-PVA, MVA
  - Middle of the road prices
  - Slowest response times
  - Better color reproduction and viewing angles than TN
  - Color/brightness shifts when viewing off-angle
- IPS (In-Plane Switching), e.g., S-IPS, H-IPS, e-IPS, P-IPS; also PLS (Plane to Line Switching) and AHVA (Advanced Hyper-Viewing Angle)
  - Most expensive
  - Best overall LCD technology for image quality, color accuracy and viewing angles
  - Slower response time than TN
  - Best choice for "color critical" work
- May need to read reviews to find out what type of panel a monitor uses
- TN vs. IPS video

Additional Information for Higher-End Displays

- Menus and icons on high resolution monitors (4K, 5K) may be tiny on older Windows/PS versions. Need Windows 10 + PS CC or use Apple computers
- The gamut of cheap displays is likely a subset of sRGB. Some more expensive displays offer the full sRGB color space.
- “Wide gamut” displays provide the full AdobeRGB color space. For these you will need two profiles: a full gamut one for photo work, and an sRGB profile so you can view websites with the proper colors.

Calibration Devices

- X-rite i1 Display Pro
  - Pro-level model
    - Can be used to program internal LUTs on NEC and Dell IPS monitors
- X-rite Color Munki
  - Mid-level model
  - May be able to program LUTs on Dell IPS monitors
- Datacolor Spyder 5
  - Pro-level model, but reviews show lower color accuracy than X-rite models
- Other models
  - Entry Level Models (e.g., Spyder Express)
    - Hardware may be good, but software is crippled
  - Spectrophotometer
    - Can profile prints as well as monitors

Calibrating

- Purpose
  - Screen views only
  - Matching Prints
    - Print Viewing Booth or Light
- Consistent Ambient Light
- Calibration Targets
  - Brightness (e.g., 80 cd/m2)
  - Color Temperature (e.g., D65)
  - Gamma (2.2)
  - Contrast (Native or a specific value, e.g., 300)
  - Iterate, if necessary, until purpose is achieved

References and Resources

- digitaldog.net
  - Original article on monitor calibration/profiling "Why Are My Prints Too Dark?" 11.07.10 https://luminous-landscape.com/why-are-my-prints-too-dark/
  - Video version of "Why Are My Prints Too Dark?" 12.04.15 http://digitaldog.net/files/Why_are_my_prints_too_dark.mp4
  - Video "The Out of Gamut overlay in Photoshop and Lightroom 11.13.15 http://digitaldog.net/files/OOG_Video.mp4
- Youtube
  - Video comparing TN and IPS monitors https://www.youtube.com/watch?v=DWXcNlh85Ps
  - Video showing what one guy had to do when his screen was still too bright after calibration/profiling https://www.youtube.com/watch?v=b9sYzWVEaqo (He calibrated to 80 cd/m2 since that was recommended after doing a measurement of his ambient light. If the software allowed it, he should have chosen a lower value like 40 cd/m2 rather than relying on the recommendation from ambient light measurement. Also, when comparing his prints to the screen, he should have soft-proofed with "Simulate Paper & Ink" selected. Nevertheless, it is an interesting video.)
  - How to Measure Lux with a DSLR camera (in case you want to know how bright your print viewing light is) https://www.youtube.com/watch?v=_xU0pWjugTo