Report: Ophthalmic Imaging Standards

Christye P. Sisson, CRA, MS
Associate Professor, Biomedical Photographic Communications
Program Chair, Photographic Sciences, School of Photographic Arts and Sciences
Retinal Color Variation Across Populations

Determined by ethnicity, pigmentation, disease process
One reason for the color differences in the appearance of the retina in fundus imaging in ophthalmology is the lack of a suitable calibration method or standard. This causes significant retinal color disparity from camera to camera, even within the same manufacturer for the same patient.
Premise

- It is potentially possible to profile a fundus camera, at least individually, to provide for greater camera-to-camera consistency
  - Applying transforms to RAW images in system would be ideal
- What we as ophthalmic imagers and practitioners believe to be “correct” retinal color is not correct at all
- A standard approach to color calibration is needed to begin to regulate input variables
Captured vs. Processed

Before

After
Objectives

- Develop a suitable calibration phantom and calibration method, and devise the best working/vendor practices to ensure color consistency across devices and manufacturers.

- To generate a repeatable, reliable method of “profiling” individual fundus camera/ophthalmic digital imaging system combinations, and using that profile to attempt to bring the various systems to a reasonable color standard.

- To work with the main companies that produce these systems to work toward this set of color standards in the interest of longitudinal research and accuracy of imaging in the field at large.
Progress

- Establishment of core participants including: ophthalmic photographers, reading centers, principles in the Ophthalmic Photographer’s Society and manufacturers, as well as beta testing sites
- Draft of problem white paper distributed, shared working space online
- Web meeting scheduled for December
  - Preparation
    - Research components of systems, existing color management standards and practices, file type, bit depth and resolution requirements
    - Image objectives/requirements of reading centers
  - Manufacturer’s discussion – what can be integrated into the systems as a final goal?
  - Method: color patches, model eye methods, capture methods
Participants:

Christye Sisson  
Rochester Institute of Technology, University of Rochester Medical Center

Bill Fischer  
Director of Imaging, Flaum Eye Institute, University of Rochester Medical Center

Jim Strong  
Ophthalmic Photographer, Penn State Hershey Eye Center

Mark Fairchild  
Rochester Institute of Technology, Director, Program of Color Science/Munsell Color Science Laboratory

Tim Bennett  
Ophthalmic Photographer, Penn State Hershey Eye Center, OPS past President

Dennis Thayer  
Fundus Photography Reading Center, University of Wisconsin

Matt Carnavale  
Executive VP and Chief Technical Officer, Sonomed/Escalon

Kevin Langton  
Director, Strategic Business Development, Carl Zeiss Meditec