

Gallery of Visual Interest



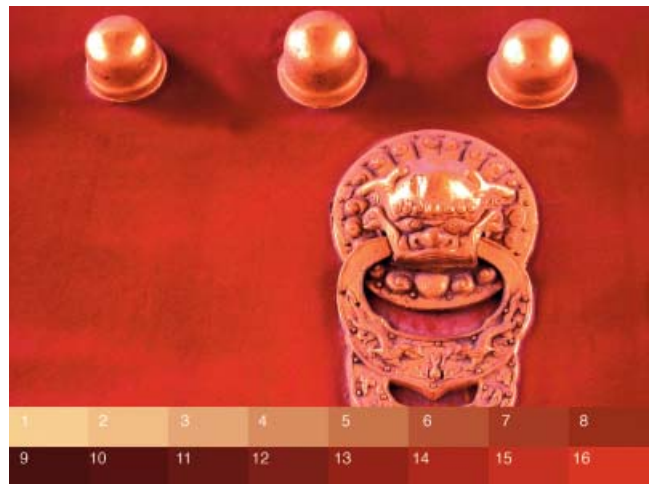
Pictorial Color Reference Images

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Introduction

We use color measurement data to construct printer profiles. When we apply these profiles in a color-managed workflow, we often look at printed pictorial color reproduction as a means to evaluate the color management performance. This may be sufficient for visual assessment of RGB images that are converted to a CMYK condition. But, this may not be sufficient for visual assessment of a color proof that should match the appearance of a press sheet. In other

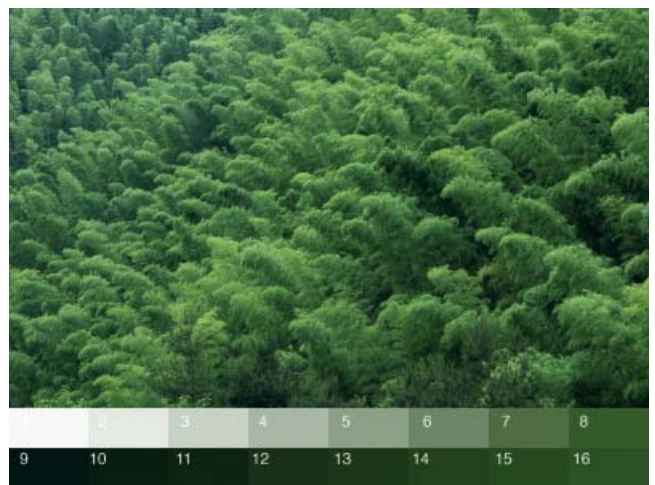
words, there is a need to measure color from the image to determine proof-to-print match objectively. In addition, we often evaluate colorimetric accuracy of a printer profile with the use of color patches that are the whole or a subset of the profiling target instead of using color patches that are independent of the profiling target. As such, a collection of pictorial color reference images is created to bridge the gap between the need for visual assessment and quantitative analysis of pictorial color image reproduction.



PCRI_20.jpg



PCRI_03.jpg



PCRI_08.jpg

What is PCRI?

Pictorial Color Reference Images (PCRI; pronounced pee-cree) is a special collection of digital images. Each image is 8" x 6" in size and has two components: (1) a 300-ppi resolution sRGB image of a real-life scene and (2) 16 color values derived from the image. There are twenty digital images in the PCRI collection.

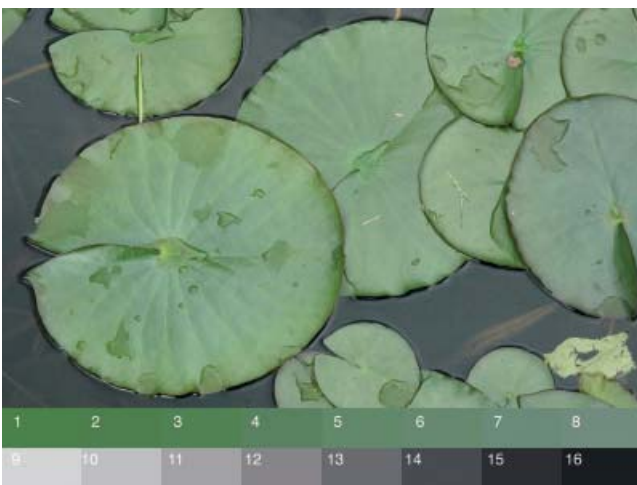
The initial selection of images was based on pleasing colors seen in a variety of scenes with different hue, chroma, and lightness. For examples, one of the PCRI image is a lake view with blue sky and white clouds; the other is a close-up view of a tree peony with vibrant hues of different colors, another image is a woman's face with hairpiece, etc.

Each image was then cropped to 8" x 5" in Photoshop

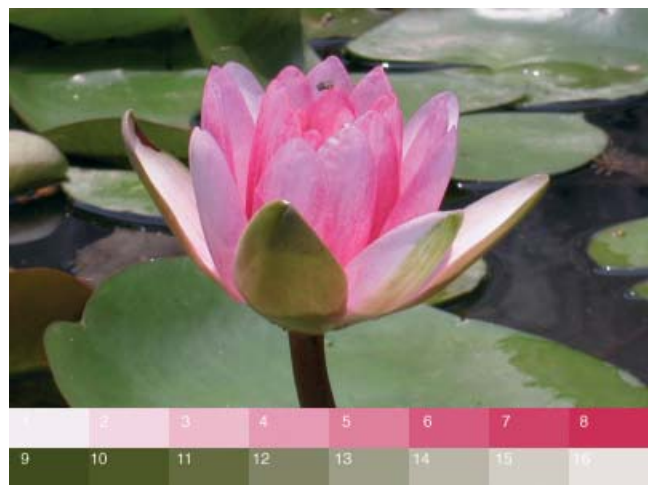
CS2. This was followed by adding an inch at the bottom of the canvas to accommodate two rows of colors selected from the scene. To select colors from the scene, two colors of visual interests were picked with one as the foreground and the other as the background using Photoshop's Color Picker tool. The gradation tool was used and a gradient was applied to the 8" x 0.5" block. The next step is to select a color from within a 1" x 0.5" area and fill the area with the selected color; thus, altering the gradient into a step-wise gradient as shown in each PCRI image. The process was repeated for creating eight more colors in the second row of the image.



PCRI_12.jpg



PCRI_07.jpg



PCRI_04.jpg

How to use PCRI?

A pictorial color reference image is a visual stimulus that links to the perception of a scene and the psychological response of the viewer. By assigning the sRGB color space to the image, PCRI represents known RGB values in the source color space.

PCRI images can be used to evaluate print quality of output devices. We can use PCRI images to examine the effect of color rendering intent visually. When there are multiple output devices or substrates available, we can use PCRI images to study how the appearance of color images is preserved in different CMYK spaces.

When color matching between two devices are critical, e.g., a press and a proofer, we can use PCRI images to

visually examine the appearance agreement between the two hardcopies under the same viewing condition. Parallel to visual assessment, we can measure color patches from hardcopies and perform color difference analyses. The goal of the quantitative assessment is to correlate the subjective visual judgment with the objective findings.

What is the PCRI List?

PCRI list is a collection of RGB data from the twenty PCRI images. There are two rows of color patches (or 16 color values) per image. Thus, the PCRI list contains 320 color values. The PCRI list represents color of visual interest typically found in digital images with various scenes. It is



PCRI_09.jpg



PCRI_11.jpg



PCRI_16.jpg

independent of device color values used in printer profile construction.

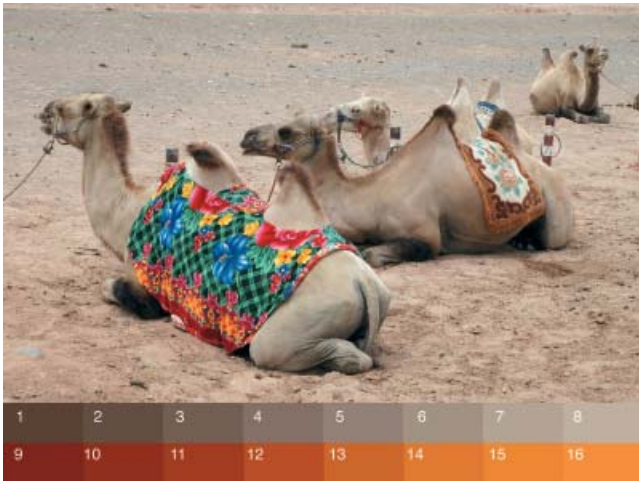
How to use the PCRI List?

Being a text file, the PCRI list can be edited using Microsoft Excel. More importantly, ColorThink 3.0 Pro can (1) convert a RGB list to its correspondent CIELAB list via a selected ICC profile and a color rendering intent, (2) compare two CIELAB lists in terms of their color differences, and (3) display a color list as individual colors in 3-dimension for visual examination. ColorThink 3.0 Pro can also transform a synthetic color target from a TIFF image into a color list. In a sense, ColorThink 3.0 Pro provides us with a color management simulation environment. We can use

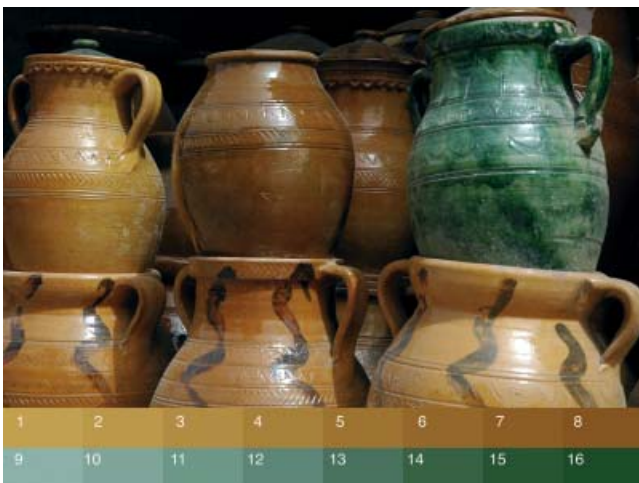
the simulation to observe what happened to PCRI images when printed. We can also use the PCRI list to predict quantitative color differences between two color output devices.

Summary

Creating the PCI list from a collection of RGB images was the result of learning from our past experiences. Exploring ways to leverage the use of the PCRI list in ColorThink 3.0 Pro is a new color management initiative at RIT. This article serves to provide a beginning. PCRI images and the PCRI list are available from the CMS web site at www.rit.edu/~gravure.



PCRI_13.jpg



PCRI_18.jpg



PCRI_19.jpg