

Universal Color Index

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BACKGROUND

Most methods of color specification use Color Matching Functions to transform a sample's reflectance spectra. From the original Munsell color system, users then transformed that into CIE color spaces beginning in 1931 and revised up to the current CIE L*a*b* standard in 1976. There were always troublesome non-linear effects in the results and perceptual similarities differed in different parts of the space. Solutions were not arrived at by analytic solutions but were estimated and applied as look-up-tables. Previous solutions like L*a*b* were based on color matching function using monochromatic light over at least a range from 400 nm to 700 nm. Current practice applies a nonlinear transformation (frequently a cube root) at the end of complex calculations - this greatly complicates calculations. L*a*b* is arbitrary and based on theoretical calculations while the Munsell system is based on perceptual experiments of how humans actually see colors.

TECHNOLOGY DESCRIPTION

University researchers have developed a novel system for the precise specification of color appearance (Munsell color space in our example but generalizable to most color appearance systems) from the reflectance spectra of the sample. The proposed process is the first time a method has been developed to calculate the transition from the location as defined by reflectance spectra to the perceptual location in a color appearance system (and the reverse) with analytic formula that maintain mathematical accuracy. The process simplifies the process many times over and gains in precision. We have criteria of precision that allows us to compare our process with the International CIE standard and show a great increase in precision.

APPLICATIONS

The system could be used for the legal description of a trademark color as used in Corporation logos. More importantly it could be used to aid in finding a precise match for a color in color reproduction work. It would also simplify calculation of mixtures of colors in printing and painting.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,520,936	08/27/2013	2007-646

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OTHER INFORMATION

CATEGORIZED AS

- » Sensors & Instrumentation
- » Scientific/Research

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