Social scientist creates computer model to determine human perception of hues

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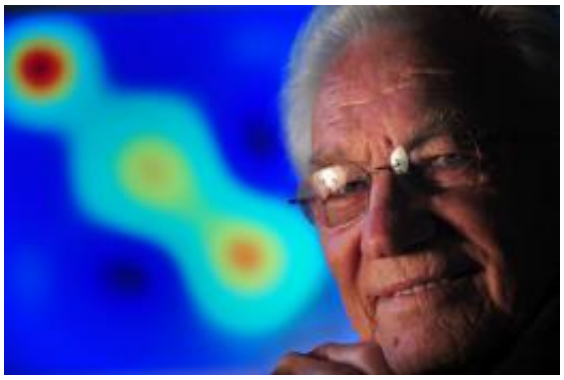

Professor A. Kimball Romney's research led to this mathematical visualization of cone photo receptor sensitivities. In theory, this visualization is the operational key to creating uniform, high quality color in a variety of fields. Daniel A. Anderson / University Communications

Variations in how people perceive colors and how those same colors appear on TV, computers and other media have confounded broadcasters, Web designers and printers trying to reproduce lifelike hues.

A. Kimball Romney, UC Irvine social sciences research professor, has found a solution - a mathematical model that determines how the human eye sees color and allows it to be replicated in other formats. His model yields a 99.4 percent match, based on International Commission on Illumination standards.

It also could advance the understanding of color blindness. The human retina consolidates information received its by many millions of photoreceptor cells and transmits them down the optic nerve, delivering information about the color of objects. While the physiological implementation of color coding was not within the scope of this study, Romney's new model could provide a means to predict how individuals perceive colors and provide to clues to what goes awry in those with color blindness.

"Light - and the way it's reflected off different objects - creates the colors we see," he says. "But the way the human eye perceives these colors is different than the way they appear when represented mathematically."

The study, published in June in the Proceedings of the National Academy of Sciences, was co-authored by Chuan-Chin Chiao of the National Tsing Hua University in Taiwan and is available online at www.pnas.org .

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