Human Perception and Information Processing

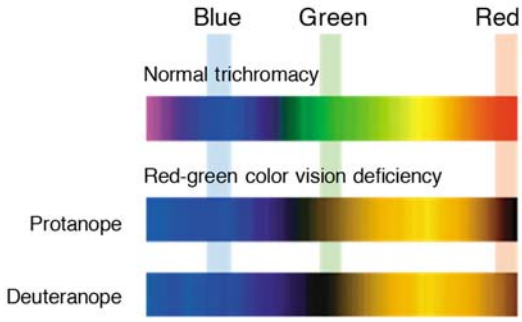
Keyword: color perception, vision system, universal color design

Area in Mechanical System Engineering, Keiko Sato, ph.D.

sato.keiko@kagawa-u.ac.jp

http://www.eng.kagawa-u.ac.jp/~satokei/index%20-%20e.html

The research summarized here involves computational processing of human perception and applications to machine and biological color vision systems.



Current Research Topics:

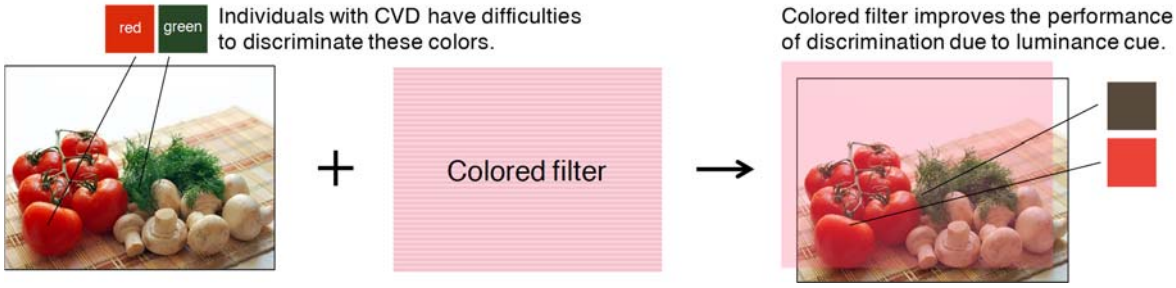
Color emotions of color vision deficient (CVD) individuals

For red-green CVD observers, some reddish colors appear desaturated and brownish, unlike those seen by normal observers. We aim to reveal differences between normal and red-green CVD observers in rating patterns of six color emotions; to examine differences in color emotions related to the human color vision.

K. Sato and T. Inoue, Perception of color emotions for single colors in red-green defective observers. *PeerJ*, 4:e2751, 1-23, 2016.

Color universal design system (digitally colored filter)

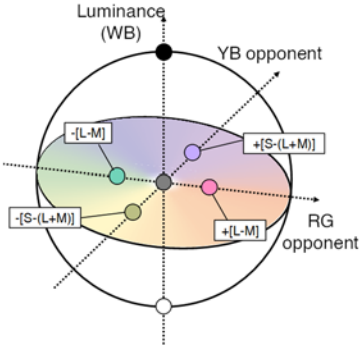
We simulate the colored filter digitally with the spectral transmittance similar to that of the red-tinted lens, and evaluate the performance on discrimination colors for CVD observers. Our study shows that the colored filter simulated induces different changes in the red–green CVD observer luminance contrast between the protan and deutan types, with the result that the performance of deuteranopes improves while that of protanopes deteriorates.



K. Sato, T. Inoue, S. Tamura, and H. Takimoto, Discrimination of colors by red-green color vision deficient observers through digitally generated red filter. *Visual Neuroscience*, 36:e001, 1-9, 2019.

Age-related changes in visual attention

Color perception in elderly is affected by reductions in intensity at the retina, and yellow-blue (YB) discrimination have been reported to be deficient in older observers. We aim to investigate the effect of color on the visual attention of older observers using a visual search task with color condition based on response of cone.



S. Tamura and K. Sato, Age-related differences in visual search for color targets manipulated based on cone-contrast model. *Proc. of the IEEE International Conference on Systems, Man, and Cybernetics*, 2988-2993, Miyazaki, Japan, 2018.