Technological Seeds

Department of Computer and Human Intelligence

As of Aug.30, 2007

• **Topic**
Color-Barrier-Free software for color vision deficiency

• **Keywords**
Color-vision-deficient (Color blindness), Simulation, Barrier-Free, Universal Design, Psychophysics, Color Science, Visual Information Processing

Professor SHINODA, Hiroyuki

Academic Background: Dr. of Eng. (Kyoto University)
Society Membership: Optical Society of America, The International Commission on Illumination (CIE), The Japan Society of Applied Physics, Optical Society of Japan, The Vision Society of Japan, The Illuminating Engineering Institute of Japan, The Color Science Association of Japan

• **Abstract** We made a simulatior of dichromat (colorblind) vision and evaluated its performance psychophysically. Based on the color simulator, a computer software, UDcolor®, was developed to assist colorblind users in viewing color images and to assist color-normal designers in creating color-barrier-free digital contents.

• Color sensation is initiated by the stimulation to three kinds of photoreceptors (S, M, L cones). Therefore normal color vision is trichromatic. Color-vision-deficiency arises from the dysfunction of one of cone types or two. A person who has only two types of cone is called dichromat.

• The simulation algorithm of dichromat color vision by Brettel *et al*. (1997) was modified to function on sRGB color displays in our dichromat color simulator. The performance of the simulator was evaluated by psychophysical experiments with dichromat or anomalous trichromat observers.

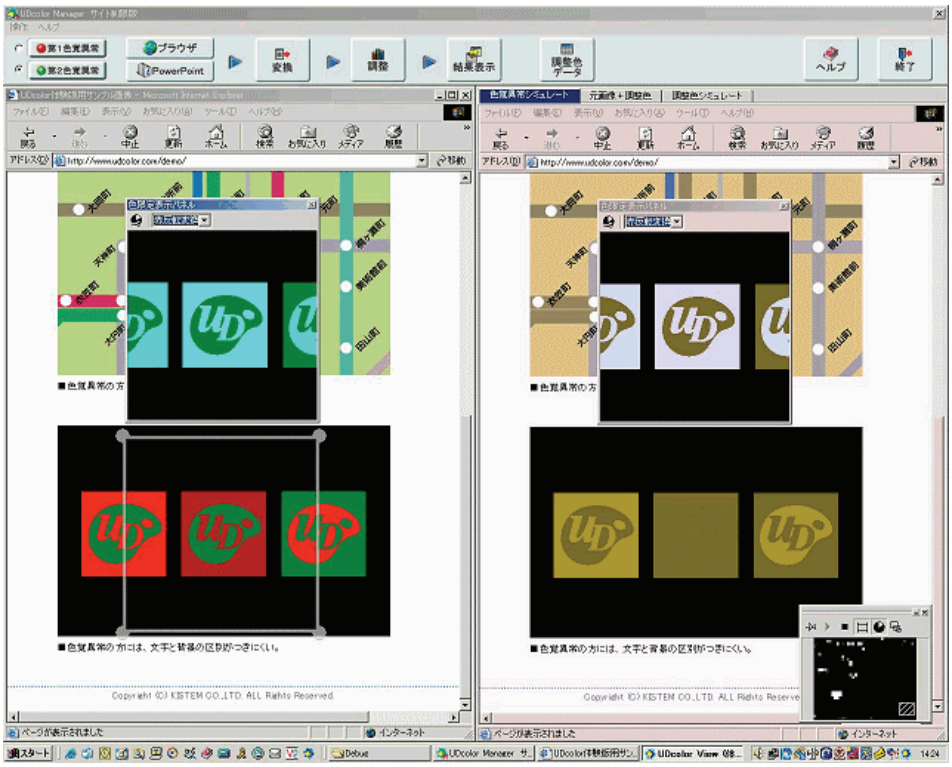
• Based on the dichromat color simulator, KISTEM Co., Ltd. developed UD color View® and UD color Manager®.

UD color View

• UD color View® is a free-downloadable software that corrects color images to be discriminable for dichromat or anomalous trichromat viewers. Color correction operates web-pages under license from KISTEM Co., Ltd.

UD color Manager

• UD color Manager® is a software which assists color-normal digital creators in designing color-barrier-free contents or images.



Left, original images; right, the simulation of dichromate color vision

Research Field	
Comment/Message	
Patents	Patent Publication No.2003-296221, WO2004/023397

Contact: The Office of Sciences and Engineering Research, Ritsumeikan University
TEL:+81-77-561-2802 FAX:+81-77-561-2811 Email: etsuna-a@st.ritsumei.ac.jp