Seeing through the eyes of the colorblind

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Toyohashi Tech researcher receives coveted Japanese government award for the invention of unique color filter–glasses. Allowing those with normal color vision to experience colorblindness, the glasses enable understanding of problems arising for people with color vision deficiency.

Shigeki Nakauchi of Toyohashi University of Technology's (Toyohashi Tech) Department of Computer Science and Engineering has been awarded the 2011 Award for Science and Technology (Development Category) by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) for the 'Development of a filter to understand what

the world looks like to color deficient people for use in Color Universal Design (CUD).'

This prestigious award is given to individuals for innovative research that is of practical use in society and improves the everyday lives and socioeconomic conditions of people worldwide.

Five percent of Japanese men and 200 million people worldwide are colorblind—so called color vision deficiency—and have difficulty in distinguishing specific color combinations. In order that the colorblind and others with normal color vision do not confuse colors, there is an urgent need for CUD (color universal design). However, people with normal vision and who are not color blind do not have an intuitive understanding of the difficulties posed by colorblindness, a situation that presents a barrier to familiarizing and promoting the CUD concept.

Filter in the form of glass loupes

In this the world's first development, a filter that modifies the optical spectrum to reproduce colorblind characteristics was developed for commercial use in 2007 (www.variantor.com). Using this filter, which comes in both eye glasses and glass loupes, non–colorblind people can experience the perceptual color confusion experienced by the colorblind due to the lack of one type of cone photoreceptor out of the three that support color vision.

Through the experience of simulated but highly realistic color blindness, it is possible to find problematic color schemes in almost any situation using the filter as a CUD tool. Currently the filter is being widely used for color combination tests in industry and in public facilities for printing material, public signs, and textbooks, including those used at CUD enlightenment seminars.

Nakauchi's invention makes a significant contribution to the familiarization and promotion of CUD by enabling all to experience the diversity of color vision, and to realize problematic color combinations.

Provided by ResearchSEA

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