

Study of Color Appearance Based on Recognized Visual Space of Illumination, RVSI

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According to the concept of the recognized visual space of illumination (RVSI) the color appearance of objects was investigated. Property of the RVSI was controlled by changing the initial visual information while keeping the real illumination constant. Firstly, to prove the lightness of an object surface is perceived in relation to the brightness size of RVSI, the lightness of test patches was judged when they were located inside two rooms. No retinal image arrangement was changed, but one room had interior lower in lightness than the other room to make the RVSI of the former smaller. The apparent lightness of test patch in each room was different. It was also investigated that the color property of the RVSI was controlled by arranging objects in the miniature room all shifting toward orange direction as if they were illuminated by an incandescent lamp. The apparent color of test patches in each room was different, in spite of having the same illumination. The results imply that the apparent color of an object is determined in relation to the color of the RVSI. The role of the space recognition in apparent color was investigated by photograph. A two-dimensional photograph can be perceived as a 3-D scene if only the photograph is given to the retina as incoming outside information. A photograph taken under incandescent lamps was placed under daylight type lamps. The color appearance of a test patch was investigated to see whether the appearance coincided with the color perceived in a 3-D space illuminated by the incandescent lamp. The results show that the color constancy holds even in a photograph if the photograph was perceived as a 3-D scene. It was concluded the color appearance of objects is determined based on the RVSI namely the recognition of a space and its illumination.