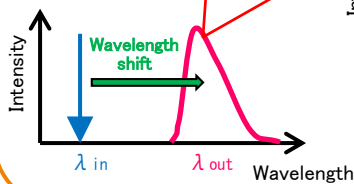


Abstract

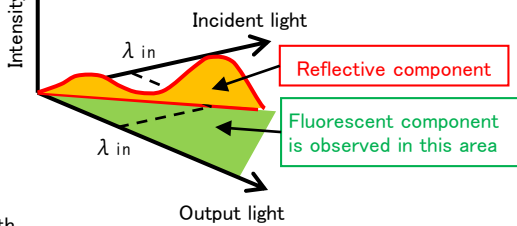
We propose a method for decomposing reflective and fluorescent components and generating an image relighted by illumination that is different from that in the image-capturing environment. Our method uses nine-view stereoscopic multiband imaging technology instead of hyperspectral imaging. Operations in the spectral domain are not necessary. Experiments were conducted using eight-band imaging systems. Experimental results show that the decomposition of reflective and fluorescent components and relighting were successful, which confirmed the effectiveness of our method. This technology has potential in digitally archiving of cultural heritage, creating digital contents for e-commerce, and confirming the authenticity of commercial products.

What is "Fluorescence" ?

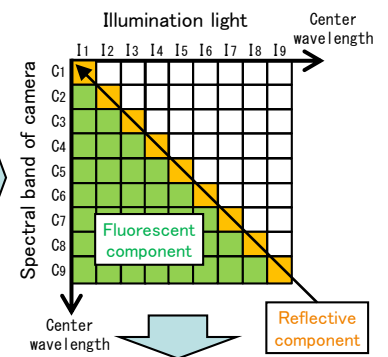
- $\lambda_{in} < \lambda_{out}$
- Spectral shape of fluorescence is **independent of illumination**



In conventional methods, the bi-spectral power distribution is measured with a hyperspectral camera and hyperspectral illumination to decompose reflective and fluorescent components.

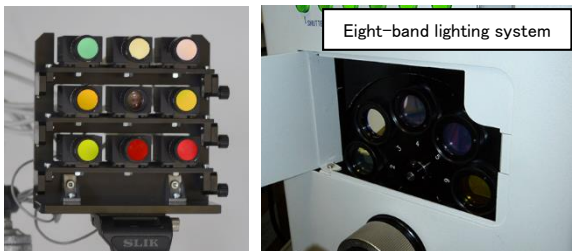


Measurement as multiband images



The spectral shape of each component is estimated by solving the inverse problem of a continuous/discrete model.

Image capturing system



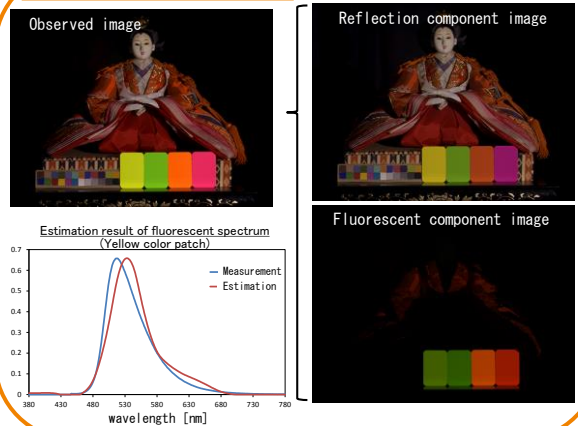
Nine-view stereoscopic multiband camera system [1, 2]

- Stereo and spectral information can be obtained at the same time
- Centered RGB camera is used for correcting disparities among images

Only changing band-pass filters of their lighting system is required.

⇒ Simpler measurement processes.

Experimental results



Related works

- [1] M. Tsuchida, T. Kawanishi, K. Kashino, J. Yamato, "A stereo nine-band camera for accurate color and spectrum reproduction," in Proc. ACM SIGGRAPH, 2012.
- [2] M. Tsuchida, K. Kashino, J. Yamato, "An eleven-band stereoscopic camera system for accurate color and spectral reproduction," in Proc. The 21st Color and Imaging Conference (CIC21), 2013

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