

[Available Issues](#) | [Japanese](#)>> [Publisher Site](#)Author:  [ADVANCED](#) | Volume  Page   
Keyword:     [TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

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[\[PDF \(473K\)\]](#) [\[References\]](#) [\[Supplementary Materials\]](#)**Estimation of the Concentration of Dyes in Clear Solutions Using a Digital Camera**[Abolfazl AGHANOURI<sup>1\)</sup>](#), [Seyed Hossein AMIRSHAHI<sup>1\)</sup>](#) and [Farnaz AGAHIAN<sup>1\)</sup>](#)*1) Department of Textile Engineering, Amirkabir University of Technology (Tehran Polytechnic)***(Received September 9, 2009)****(Accepted October 21, 2009)**

The RGB values obtained from a digital camera were employed for reconstruction of spectral data of transparent colored solutions. A capturing box was assembled, and a spectral dataset gathered from colored solutions was used for this purpose. The matrix **R** method was employed to reconstruct the spectral transmission from RGB data. Two different light sources *i.e.* fluorescent and halogen lamps, were employed to achieve two sets of camera responses. The results of spectral transmission recovery confirmed the applicability of the matrix **R** method by the value of 3.24% as the average of root mean square percentage errors between the actual and reconstructed spectra. The reconstructed transmissions were converted to absorbance spectra, and the concentrations of colored solutions were simply estimated by Beer's Law. The estimated concentrations were within the acceptable concentrations errors for some types of applications, such as estimating the amount of dyestuff in the dye solution.

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