Accepted Manuscript

Using suprathreshold color-difference ellipsoids to estimate any perceptual color-difference

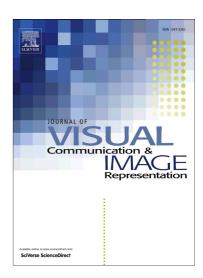
Samuel Morillas, Mark D. Fairchild

PII: S1047-3203(18)30117-2

DOI: https://doi.org/10.1016/j.jvcir.2018.05.022

Reference: YJVCI 2202

To appear in: J. Vis. Commun. Image R.



Please cite this article as: S. Morillas, M.D. Fairchild, Using suprathreshold color-difference ellipsoids to estimate any perceptual color-difference, *J. Vis. Commun. Image R.* (2018), doi: https://doi.org/10.1016/j.jvcir.2018.05.022

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Using suprathreshold color-difference ellipsoids to estimate any perceptual color-difference

Samuel Morillas*a, Mark D. Fairchild^b

^aInstituto Universitario de Matemática Pura y Aplicada, Universitat Politècnica de València, Camino de Vera s/n 46022 Valencia, Spain ^bMunsell Color Science Laboratory, Rochester Institute of Technology, 1 Lomb Memorial Drive, Rochester, NY 14623 (USA)

Abstract

Relating instrumentally measured to visually perceived colour-differences is one of the challenges of advanced colorimetry. Lately, the use of color difference formulas is becoming more important in the computer vision field as it is a key tool in advancing towards perceptual image processing and understanding. In the last decades, the study of contours of equal color-differences around certain color centers has been of special interest. In particular, the contour of threshold level difference that determines the just noticeable differences (JND) has been deeply studied and, as a result, a set of 19 different ellipsoids of suprathreshold color-difference is available in the literature. In this paper we study whether this set of ellipsoids could be used to compute any color difference in any region of the color space. To do so, we develop a fuzzy multi-ellipsoid model using the ellipsoids information along with two different metrics. We see that the performance of the two metrics vary significantly for very small, small, medium and large color differences. Therefore, we also study how to adapt two metric parameters to optimize performance. The obtained results outperform the currently CIE-recommended color-difference formula CIEDE2000.

^{*}Corresponding author e-mail: smorillas@mat.upv.es

^{*}S. Morillas acknowledges the support of grants PRX16/00050 and PRX17/00384 (Ministerio de Educación, Cultura y Deporte) and MTM2015-64373-P (MINECO/FEDER, UE). The authors thank Dr. Manuel Melgosa, Dr. Luis Gómez-Robledo, Dr. Esther Sanabria-Codesal, Dr. Francisco Montserrat and Mr. Fu Jiang for providing useful materials, information and suggestions.

Download English Version:

https://daneshyari.com/en/article/6938062

Download Persian Version:

https://daneshyari.com/article/6938062

<u>Daneshyari.com</u>