Spatial gamut mapping among non-inclusive gamuts

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Spatial gamut mapping among non-inclusive gamuts

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Abstract

Gamut mapping transforms the color gamut of an image to that of a target device. Two cases are usually considered: gamut reduction (target gamut smaller than source gamut), and gamut extension (target gamut larger than the source gamut). Less attention is devoted to the more general case, when neither gamut is fully included in the other. In this work we unify and expand two recent methods for gamut extension and reduction, so as to simultaneously perform both forms of gamut mapping in different regions of the same image without introducing color artifacts or halos. We demonstrate the usefulness of this approach for the traditional gamut mapping problem, and also how the proposed method can be used to adapt the color palette of an image so that it is closer to that of a given reference image. Results are compared with the state-of-the-art and validated through user tests and objective metrics.

Keywords: Gamut mapping, gamut extension, gamut reduction, color coherence.

1. Introduction

The term *color gamut* refers either to the set of colors that are present in an image or the set of colors that a device can reproduce. Gamut mapping is the process by which an image is modified so that its colors are adapted to the gamut of a given output device, and it can take the form of gamut reduction, when the target gamut is included in the source gamut, or gamut extension, when the target gamut is larger than and includes the source gamut.