

COLOR STABILIZATION ALONG TIME AND ACROSS SHOTS OF THE SAME SCENE, FOR ONE
OR SEVERAL CAMERAS OF UNKNOWN SPECIFICATIONS

Marcelo Bertalmío

Universitat Pompeu Fabra, Spain

marcelo.bertalmio@upf.edu

We propose a method for color stabilization of shots of the same scene, taken under the same illumination, where one image is chosen as reference and one or several other images are modified so that their colors match those of the reference. We make use of two crucial but often overlooked observations: firstly, that the core of the color correction chain in a digital camera is simply a multiplication by a 3×3 matrix; secondly, that to color-match a source image to a reference image we don't need to compute their two color correction matrices, it's enough to compute the operation that transforms one matrix into the other. This operation is a 3×3 matrix as well, which we call H . Once we have H , we just multiply by it each pixel value of the source and obtain an image which matches in color the reference. To compute H we only require a set of pixel correspondences, we don't need any information about the cameras used, neither models nor specifications or parameter values. We propose an implementation of our framework which is very simple and fast, and show how it can be successfully employed in a number of situations, comparing favourably with the state of the art. There is a wide range of applications of our technique, both for amateur and professional photography and video: color matching for multi-camera TV broadcasts, color matching for 3D cinema, color stabilization for amateur video, etc.

Joint work with Javier Vazquez-Corral (Universitat Pompeu Fabra, Spain).