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Estimating Color and Texture Parameters for Vector Graphics

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Abstract

Diffusion curves are a powerful vector graphic representation that stores an image as a set of 2D Bezier curves with colors defined on either side. These

colors are diffused over the image plane, resulting in smooth color regions as well as sharp boundaries. In this paper, we introduce a new automatic diffusion curve coloring algorithm. We start by defining a geometric heuristic for the maximum density of color control points along the image curves. Following this, we present a new algorithm to set the colors of these points so that the resulting diffused image is as close as possible to a source image in a least squares sense. We compare our coloring solution to the existing one which fails for textured regions, small features, and inaccurately placed curves. The second contribution of the paper is to extend the diffusion curve representation to include texture details based on Gabor noise. Like the curves themselves, the defined texture is resolution independent, and represented compactly. We define methods to automatically make an initial guess for the noise texture, and we provide intuitive manual controls to edit the parameters of the Gabor noise. Finally, we show that the diffusion curve representation itself extends to storing any number of attributes in an image, and we demonstrate this functionality with image stippling and hatching applications.

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