

# Effective Color-Difference-Based Interpolation Algorithm for CFA Image

Demosaicking

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## Abstract

This paper proposes an effective color-difference-based (ECDB) interpolation algorithm for CFA Image demosaicking. A CFA image consists of a set of spectrally selective filters which are arranged in an interleaved pattern such that only one of color component is sampled at each pixel location. To improve the quality of reconstructed full-color images from color filter array (CFA) images, the ECDB algorithm first analyzes the neighboring samples around a green missing pixel to determine suitable samples for interpolating the value of this green missing pixel. After finishing the interpolation operations of all the green missing pixels, a complete green plane (i.e. plane) can be obtained. The ECDB algorithm then makes use of the high correlation between R, G, and B planes to produce the red-green and blue-green color difference planes and further reconstructs the red and blue planes in successive operations. Because of the green plane provides twice information than red and blue planes, the algorithm exploits the information of green plane more than that of red/blue plane so that the full color image can be reconstructed more accurately. In essence, the ECDB algorithm uses the red-green and blue-green color difference planes, and develops different conditional operations according to the horizontal, vertical, and diagonal neighboring pixel information with suitable weighting technique. The experimental results demonstrate that the proposed algorithm has outstanding performance.

Keyword : Color filter array, Demosaicking, Interpolation