

Review on Quaternion Gradient Operator with Marginal and Vector Approaches for Colour Edge Detection

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Abstract : Gradient estimation is one of the most fundamental tasks in the field of image processing in general, and more particularly for color images since that the research in color image gradient remains limited. The widely used gradient method is Di Zeno's gradient operator, which is based on the measure of squared local contrast of color images. The proposed gradient mechanism, presented in this paper, is based on the principle of the Di Zeno's approach using quaternion representation. This edge detector is compared to a marginal approach based on multiscale product of wavelet transform and another vector approach based on quaternion convolution and vector gradient approach. The experimental results indicate that the proposed color gradient operator outperforms marginal approach, however, it is less efficient than the second vector approach.

Keywords : gradient, edge detection, color image, quaternion

Conference Title : ICCVIPTODC 2021 : International Conference on Computer Vision, Image Processing Technologies, Object Detection and Classification

Conference Location : Paris, France

Conference Dates : November 18-19, 2021