



A New Vectorial Order Approach Based on the Classification of Tuples Attribute and Relative Absolute Adaptive Referent: Applications to Multicomponent Images

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Résumé en anglais	<p>In this paper, we are presenting a new vector order, a solution to the open problem of the generalization of mathematical morphology to multicomponent images and multidimensional data. This approach uses the paradigm of P-order. Its primary principle consists, first in partitioning the multi-component image in the attribute space by a classification method in different numbers of classes, and then the vector attributes are ordered within each class (intra-order-class). And finally the classes themselves are ordered in turn from their barycenter (inter-class order). Thus, two attribute vectors (or colors) whatever, belonging to the vector image can be compared. Provided with this relation of order, vectors attributes of a multivariate image define a complete lattice ingredient necessary for the definition of the various morphological operators. In fact, this method creates a strong close similarity between vectors in order to move towards an order of the same principle as defined in the set of real numbers. The more the number of classes increases, the more the colors of the same class are similar and therefore the absolute adaptive referent tends to be optimal. On the other hand, the more the class number decreases or equals two, the more our approach tends towards the hybrid order developed previously. The proposed order has been implemented on different morphological operators through different multicomponent images. The fundamental robustness of our approach and that relating to noise have been tested. The results on the gradient, Laplacian and Median filter operators show the performance of our new order.</p>

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