

Sub-Pixel Mapping Based on New Mixed Interpolation

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Abstract : Due to the limited environmental parameters and the limited resolution of the sensor, the universal existence of the mixed pixels in the process of remote sensing images restricts the spatial resolution of the remote sensing images. Sub-pixel mapping technology can effectively improve the spatial resolution. As the bilinear interpolation algorithm inevitably produces the edge blur effect, which leads to the inaccurate sub-pixel mapping results. In order to avoid the edge blur effect that affects the sub-pixel mapping results in the interpolation process, this paper presents a new edge-directed interpolation algorithm which uses the covariance adaptive interpolation algorithm on the edge of the low-resolution image and uses bilinear interpolation algorithm in the low-resolution image smooth area. By using the edge-directed interpolation algorithm, the super-resolution of the image with low resolution is obtained, and we get the percentage of each sub-pixel under a certain type of high-resolution image. Then we rely on the probability value as a soft attribute estimate and carry out sub-pixel scale under the 'hard classification'. Finally, we get the result of sub-pixel mapping. Through the experiment, we compare the algorithm and the bilinear algorithm given in this paper to the results of the sub-pixel mapping method. It is found that the sub-pixel mapping method based on the edge-directed interpolation algorithm has better edge effect and higher mapping accuracy. The results of the paper meet our original intention of the question. At the same time, the method does not require iterative computation and training of samples, making it easier to implement.

Keywords : remote sensing images, sub-pixel mapping, bilinear interpolation, edge-directed interpolation

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