Abstract: High Speed Point Matching Using Voronoi Feature Space and Partition Search Technique

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Abstract

Here, we propose a new method to detect the correspondence between two images by using the Voronoi feature space and partition search technique for high speed point matching. We first extract feature points from the two images using the SUSAN corner detector, and then construct a Voronoi surface, which includes distance information for the feature points. Next, we select the portion of the input image (model patch) in which the feature points have the maximum variance of position to estimate the correspondence area of the input image. Shifting the model patch over the input image and calculating the minimum Voronoi distance allow us to obtain the corresponding feature set; however, this procedure represents a considerable burden. To overcome this problem, we propose a partition search algorithm for detecting the optimal correspondence between points in the two images. This method can reduces the search range by a fourth at a time. Thus, our algorithm is faster than conventional methods such as the Hausdorff matching algorithm.

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