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Multiple Images Stitching Based on Gradually Changing Matrix

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Abstract : Image stitching is a very important branch in the field of computer vision, especially for panoramic map. In order to eliminate shape distortion, a novel stitching method is proposed based on gradually changing matrix when images are horizontal. For images captured horizontally, this paper assumes that there is only translational operation in image stitching. By analyzing each parameter of the homography matrix, the global homography matrix is gradually transferred to translation matrix so as to eliminate the effects of scaling, rotation, etc. in the image transformation. This paper adopts matrix approximation to get the minimum value of the energy function so that the shape distortion at those regions corresponding to the homography can be minimized. The proposed method can avoid multiple horizontal images stitching failure caused by accumulated shape distortion. At the same time, it can be combined with As-Projective-As-Possible algorithm to ensure precise alignment of overlapping area.

Keywords : image stitching, gradually changing matrix, horizontal direction, matrix approximation, homography matrix
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