Integration of Corners and Edges for Image Matching using Aerial Imagers

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Abstract: Image matching is an essential technique to link the geometric relation between multiple aerial images for varied applications such 3D modeling and texture mapping. Many related works have done good results with different strategies using optimal thresholds. Among these works, the area-based concept is a useful and straightforward approach. Nevertheless, the gray value distribution along building boundary is still a challenge work because of the gray value discontinuity. For this reason, an integrated matching procedure is proposed to identify conjugate points via edges and corners. The proposed scheme has two parts including feature detection and image matching. The first part implements the topological gradient connection (TGC) analysis to detect edges and corners simultaneously from used aerial images. The second part then starts from corners to locate candidates along the epipolar lines. The corner angle and gray value similarity along the edges are the used indices to estimate conjugates from candidates. The used aerial images were captured from DMC II with the spatial resolution of 7 cm. For the validation, the matched results were manually checked. According to the preliminary results, the proposed method shows its capability to improve the matching successful rate and accuracy for building areas.

Keyword : matching, aerial image, edges, corners, epipolar