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LINE-BASED MULTI-IMAGE MATCHING FOR FAÇADE RECONSTRUCTION

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Abstract. This research integrates existing LOD 2 building models and multiple close-range images for façade structural lines extraction. The major works are orientation determination and multiple image matching. In the orientation determination, Speeded Up Robust Features (SURF) is applied to extract tie points automatically. Then, tie points and control points are combined for block adjustment. An object-based multi-images matching is proposed to extract the façade structural lines. The 2D lines in image space are extracted by Canny operator followed by Hough transform. The role of LOD 2 building models is to correct the tilt displacement of image from different views. The wall of LOD 2 model is also used to generate hypothesis planes for similarity measurement. Finally, average normalized cross correlation is calculated to obtain the best location in object space. The test images are acquired by a nonmetric camera Nikon D2X.

The total number of image is 33. The experimental results indicate that the accuracy of orientation determination is about 1 pixel from 2515 tie points and 4 control points. It also indicates that line-based matching is more flexible than point-based matching.

[Conference Paper](#) (PDF, 691 KB)

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