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QUALITY ANALYSIS ON RANSAC-BASED ROOF FACETS EXTRACTION FROM AIRBORNE LIDAR DATA

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Abstract. RANSAC algorithm is a robust method for model estimation. It is widely used in the extraction of geometry primitives and 3D model reconstruction. However, there has been relatively little comprehensive evaluation in RANSAC-based approach for plane extraction. In order to provide a reference for improving the quality on RANSAC-based approach for roof facets extraction or segmentation, this paper focuses on the quality analysis on classical RANSAC algorithm. Airborne LIDAR data from the test Area 1 and Area 2 in Vaihingen (German) is used. 33 buildings (4 buildings with flat roofs and 29 buildings with slope roofs) extracted from LIDAR data are taken as input for planes extraction. Based on the characteristics of detected planar surfaces, planes can fall into several categories: non-segmented planes, over-segmented planes, under-segmented planes and spurious planes. Then, several causes for these quality problems are discussed. Some experimental results and analyses show that, considering spatial-domain connectivity, most of the quality problems of classical RANSAC algorithm can be improved. However, there are still many issues requiring in-depth research. Finally, some methods are suggested to solve these problems.

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