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AN ADAPTIVE APPROACH FOR SEGMENTATION OF 3D LASER POINT CLOUD

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Abstract. Automatic processing and object extraction from 3D laser point cloud is one of the major research topics in the field of photogrammetry. Segmentation is an essential step in the processing of laser point cloud, and the quality of extracted objects from laser data is highly dependent on the validity of the segmentation results. This paper presents a new approach for reliable and efficient segmentation of planar patches from a 3D laser point cloud. In this method, the neighbourhood of each point is firstly established using an adaptive cylinder while considering the local point density and surface trend. This neighbourhood definition has a major effect on the computational accuracy of the segmentation attributes. In order to efficiently cluster planar surfaces and prevent introducing ambiguities, the coordinates of the origin's projection on each point's best fitted plane are used as the clustering attributes. Then, an octree space partitioning method is utilized to detect and extract peaks from the attribute space. Each detected peak represents a specific cluster of points which are located on a distinct planar surface in the object space. Experimental results show the potential and feasibility of applying this method for segmentation of both airborne and terrestrial laser data.

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