

Pole-like Roadside Objects Extraction from Mobile Lidar Point Clouds

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Abstract: Mobile lidar system is a cost-effective technique for urban area mapping. It can acquire very dense and accurate 3-D point clouds along road corridors. Mobile lidar data provides plentiful road information such as road surface, road marks, and roadside objects that can be applied on a detailed street-level road model reconstruction. However, the irregular 3-D points are very massive and do not have semantic information about features. For this reason, it is difficult to extract features from mobile lidar data directly. This research focuses on automatic process for pole-like roadside object extraction from mobile lidar data. Pole-like roadside objects includes traffic lights, street lights, telegraph poles, road signs, and others. The major work contains lidar point clouds segmentation and pole-like object component refinement and merging process. Since massive data capacity and lacking of semantic feature information, lidar point clouds segmentation is a prerequisite procedure for feature extraction. In lidar data segmentation, we first remove road surface lidar points by trajectory data and road boundary information. We use these non-road points for segmentation process by an Octree and region growing process in order to group lidar points into many clusters. Then, we use a refinement and merging process to extract pole-like object components from the segmentation results. The pole-like object extraction consider geometric and cluster features. The research area is located in Taipei city, Taiwan. The mobile lidar data is acquired by Riegl VMX-250 system. Experimental results indicate that the proposed process may extract pole-like roadside objects effectively.

Keyword: mobile lidar, point cloud, segmentation, pole-like objects extraction