Reconstruction of Vertical Pole-Like Objects from Vehicle-Borne LiDAR Point Cloud by Scene Knowledge

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ABSTRACT: With the development of mobile mapping system (MMS), vehicle-borne LiDAR system is suitable to collect precise 3D point cloud of the detailed road corridor efficiently. Because the vehicle-borne LiDAR system records numerous point cloud and complicated information of road corridor, those point cloud can be used in reconstructing the objects in road corridor after data preprocessing. In the objects of road corridor, pole-like objects is one of most important and basic road information. Therefore, this study focuses on using scene knowledge to reconstruct vertical pole-like objects from vehicle-borne LiDAR point cloud. First of all, the points on the ground and sidewalk will be filtered. Then, the non-ground and non-sidewalk points will be gathered and clustered through the octree-structured voxel space and connected-component labeling (CCL) algorithm developed by Wang (2011). In vehicle-borne LiDAR point cloud, the point cloud cannot describe complete pole-like objects and some point cloud might include points on attachments. Therefore, the scene knowledge and RANSAC algorithm will be employed to extract and reconstruct pole-like objects from vehicle-borne LiDAR point cloud at the final step.