Abstract

Point clouds data acquired from airborne LiDAR point cloud data sources have great ability to provide vital structural information about geospatial objects. Identification, segmentation and visualization of airborne LiDAR point cloud data is interesting but considerably challenging problem. Processing LiDAR point cloud data can reveal several interesting properties of the geospatial objects. However the complexity of segmentation and visualization varies across different structures of geospatial objects viz. building structures, tree crowns, canopies etc. It is relatively complex compared to manmade objects. This paper explores and establishes the usefulness of variant of region growing algorithm for segmentation and 3-D visualization of sparse forest obtained from airborne LiDAR data stored as point clouds. The role of point normal and curvature in progressive region growing process is highlighted. The algorithm implicitly segments the ground from non-ground objects on the forest surface and enables improved visualization in 3-D space. The proposed approach achieves accuracy as high as 95.67% in segmentation of forest region and exhibits significant visual performance when compared to standard visualization platform.
References


13. Li, Wenkai; Guo, Qinghua; Jakubowski, Marek K.; Kelly, Maggi, "A New Method for Segmenting Individual Trees from the Lidar Point Cloud", Photogrammetric Engineering & Remote Sensing, Number 1 / January 2012, pp. 75-84(10), http://dx.doi.org/10.14358/PERS.78.1.75


16. F. Laefer, Debra; Truong-Hong, Linh; Fitzgerald, Michael, “Processing of Terrestrial Laser Scanning Point Cloud Data for Computational Modelling of Building Facades”, Recent Patents on Computer Science, Volume 4, Number 1, January 2011, pp. 16-29(14)


18. LIU Bin, JIANG Kaiyong, “Triangular Mesh Model Reconstruction from Scan Point Clouds Based on Template”, Tsinghua Science and Technology, June 2009, 14(S1): pp. 56-61


Index Terms

Computer Science

Information Sciences

Keywords

LiDAR, 3-D Visualization, Region Growing, Segmentation, Forest Visualization.