Development of a Shape Based Estimation Technology Using Terrestrial Laser Scanning

Authors : Gichun Cha, Byoungjoon Yu, Jihwan Park, Minsoo Park, Junghyun Im, Sehwan Park, Sujung Sin, Seunghee Park

Abstract : The goal of this research is to estimate a structural shape change using terrestrial laser scanning. This study proceeds with development of data reduction and shape change estimation algorithm for large-capacity scan data. The point cloud of scan data was converted to voxel and sampled. Technique of shape estimation is studied to detect changes in structure patterns, such as skyscrapers, bridges, and tunnels based on large point cloud data. The point cloud analysis applies the octree data structure to speed up the post-processing process for change detection. The point cloud data is the relative representative value of shape information, and it used as a model for detecting point cloud changes in a data structure. Shape estimation model is to develop a technology that can detect not only normal but also immediate structural changes in the event of disasters such as earthquakes, typhoons, and fires, thereby preventing major accidents caused by aging and disasters. The study will be expected to improve the efficiency of structural health monitoring and maintenance.

Keywords : terrestrial laser scanning, point cloud, shape information model, displacement measurement
Conference Title : ICGTNHM 2018 : International Conference on Geospatial Technology and Natural Hazard Management
Conference Location : Tokyo, Japan
Conference Dates : May 28-29, 2018