Assessing Accuracy of the Vertical Component of Airborne Laser Scanner for 3D Urban Infrastructural Mapping.

ABSTRACT

This study presents two methods used to measure the accuracy of the height component of Airborne Laser Scanning (ALS) data.The objectives are: to assess the accuracy of LiDAR data, to find correlation between the actual and sensor recorded height, and to explore the effectiveness of linear regression model for accuracy assessment. Field observation was carried out with Total Station as reference data and the corresponding data obtained from normalized digital surface model (n-DSM). First, statistical method was used to obtained a Root Mean Square Error (RMSE) value of 0.607 and linear accuracy of 1.18948 at 95% confidence level. Similarly, linear regression function was used to obtained RMSE value of 0.5073 and linear accuracy of 1.10999. The study shows that ALS recorded height is reliable for 3D urban mapping. A resulting correlation coefficient of 0.9919 indicates a very good agreement between the sensor recorded height and the actual height of the object ($R2= 0.9839$; p less than 2.2e-16). The study indicates that linear regression model is effective for assessing the accuracy of ASL data.