

Assessing the accuracy of terrestrial laser scanner for surveying applications in Sri Lanka

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Abstract

3D laser scanning or terrestrial lidar instruments have been in used in surveying task since the 1990's but it is very new technology for the Sri Lankan surveying field. Terrestrial laser scanners have been proven to be a very versatile surveying instrument with applications in many sectors of use like, Detail topographic survey, Road & Railway survey, Construction Site, Volumetric Survey/ Mining Survey, Monitoring Survey, Critical location survey, Crime Scene, Accidents, Tunnel Survey, BIM – Building Information Modelling & EMP – Electrical Mechanical Plumbing and Archaeological site survey.

The results of any surveying task must meet specific conditions to provide the required accuracy. Therefore, any surveying work includes not only the relative positions of points and objects but also an accuracy of the results. It is imperative that a new technology like terrestrial laser scanning instrument before been use in the actual field data collection to go under accuracy analysis for Sri Lankan field conditions.

One of the fundamental theories is “Practical is up on proven principal” in accordance with this theory the accuracy of the terrestrial laser scanner is going to be analyzed against the most commonly used surveying instrument in the field the Total station.

The comparison will be done in normal Sri Lankan field condition with weather, heat, and pressure to get much better accuracy comparison.

The experiments are designed in the following way, two traverses from both the Total Station and the Terrestrial Laser Scanner are going to be run on the same set of ground points then 3D error of each measurement is going to analyze using adjustment theory. The calculation will be done using and computer algorithm.

As a conclusion it is possible to say that terrestrial lacer scanning can be successfully be used in Sri Lankan surveying tasks

Keywords - 3D laser scanning, LiDAR, Terrestrial Laser Scanner