ANALYSIS OF SCALING FACTOR IN TERRESTRIAL LASER SCANNING PRE-PROCESSING PROCEDURE

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AUTHOR'S DECLARATION

I declare that the work in this thesis/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Similar to other instruments in Geomatics field, terrestrial laser scanner has its own coordinate system. The scanner measures start from local coordinate system for each terrestrial laser scanner station. Then, perform registration process to convert into one global coordinate system. In terrestrial laser scanner the scale factor is neglected by most researchers because it is shown to be irrelevant in laser scanner pre-processing procedure. However, for total station and global positioning system that have similar concept with terrestrial laser scanner, applied scale factor in coordinate transformation calculation. For this reason, this study focused on investigation of the effect of scaling factor in terrestrial laser scanner pre-processing procedure. Investigations began by develop a datum transformation program. Australis software was used as a benchmarking for developed datum transformation program and the results were evaluated by using statistical testing. The develop program was applied for three experiment with three different configurations network (i) reduction of scan stations, (ii) reduction of surfaces, and (iii) reduction of target points. Statistical analysis was executed and results show that the scaling factor in laser scanner pre-processing procedure was not significant at 95% confidence interval. It is statistically verified that scaling factor is shown to be irrelevant in laser scanner coordinate transformation procedure.

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