ACCURACY ASSESSMENT OF DIGITAL TERRAIN MODEL (DTM) CONSTRUCTED CLOTH SIMULATION FILTER (CSF) AND MULTI CURVATURE CLASSIFICATION (MCC) ALGORITHM ON UAV LIDAR DATASET

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AUGUST 2023

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Thesis submitted to the Universiti Teknologi MARA Malaysia
in partial fulfilment for the award of the degree of the
Bachelor of Surveying Science and Geomatics (Honours)

AUGUST 2023

DECLARATION

I declare that the work in this thesis 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 and Regulations for Postgraduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Unmanned aerial vehicles (UAVs) offer a cost-effective and efficient solution for acquiring high-resolution data over small areas, enabling the generation of orthophotos and three-dimensional point clouds. These point clouds serve as the foundation for deriving accurate digital terrain models (DTMs). However, challenges arise in processing airborne laser scanning point clouds to generate DTMs, particularly when dealing with different land cover types and slopes. This study aims to evaluate the effectiveness of open-source software algorithms for ground classification in lidar point clouds and the subsequent generation of accurate DTMs. Two algorithms, the Cloth Simulation Filter (CSF) in CloudCompare and the Multiscale Curvature Classification (MCC) in Global Mapper, were tested for this purpose. The study encompasses two test areas, one featuring a flat terrain and the other a hilly terrain. Comparative analysis of software packages, including Global Mapper and CloudCompare, was conducted based on their processing methods and point cloud accuracy. The evaluation was carried out using qualitative and quantitative approaches, considering specific criteria tailored to each area's distinct land cover and slope characteristics. The findings presented in this study provide valuable recommendations for selecting suitable software for processing airborne laser scanning data in the Batu Kawan area.

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