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BACHELORS IN SURVEYING SCIENCE AND GEOMATICS (HONOURS) - AP220

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Thesis submitted in fulfilment
of the requirements for the degree of
Bachelors in Surveying Science and Geomatics (Honours)

College of Built Environment, CBE.

AUTHOR'S 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 Under - Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Undeniably, Global Navigation Satellite System (GNSS) technology is capable of providing position accuracy up to the millimetre level. However, achieving accurate positioning using GNSS in forestry regions poses challenges due to the presence of trees, which introduce a signal multipath effect leading to increased positional errors. Over the past few years, there has been tremendous development and production of GNSS equipment. With significantly lower prices, several GNSS manufacturers claim that their technology can deliver accurate positioning in forestry areas. Therefore, this study aims to test the feasibility of the low-cost GNSS receiver, specifically the South C1 Pro model, in a forest environment using the static and Real-Time Kinematic (RTK) methods. Two different types of forests were selected as the testing areas: a mixed forest and an oil palm plantation in UiTM Perlis. Five (5) testing points were randomly chosen for each testing area. The true coordinates at each point were determined based on the two control points in an open area, which were surveyed using a total station. For the static method, the observations were conducted using the South C1 Pro and Topcon GR5 receivers with a 15-minute observation period. The data was processed using Trimble Business Center (TBC) software. A comparison with the established coordinates revealed that the Topcon GR5 provided better accuracy than the South C1 Pro, with root mean square errors (RMSE) of 0.073m for the north component, 0.2723m for the east component, and 0.323m for the height component. Meanwhile, for the RTK method, the observations were conducted using only the South C1 Pro receiver. Surprisingly, the comparison with the established coordinates showed that the South C1 Pro was able to achieve good accuracy, with an RMSE in below than 3cm accuracy for the north and east components but the height component is in above that 1cm which on tested point 2 and tested point 3 in palm tree where the height is 0.245m and 0.373m respectively.

Keywords: Real-Time Kinematic, Accuracy Under Forestry Area, Static Method

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