

RELIABILITY OF GNSS PERFORMANCE USING COMMERCIAL
LOCALIZATION TECHNIQUE

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THESIS TITLE

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DECLARATION

I declare that the work on this project/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA (UiTM). This project/dissertation is original, and it is the result of my work, unless otherwise indicated or acknowledged as referenced work.

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ABSTRACT

Nowadays, surveyors tend to use localization technique as it is easier to set up than conventional RTK. With the constant innovation of GNSS survey equipment, the number of manufacturers claiming their device can provide a high accuracy using single point reference point for localization increases. This study evaluates the reliability of GNSS performance using commercial localization techniques, focusing on three key points: assessing the effectiveness of current methods in GNSS-based surveying and mapping, comparing the traditional use of three reference points for localization with a single point suffices, and investigating the distance between reference points influences data quality to determine optimal spacing for accuracy. By analyzing these aspects, the research aims to provide insights into improving GNSS-based surveying practices, potentially reducing costs and enhancing spatial data quality across various applications. The methodology for this research involves evaluating the reliability and effectiveness of single-point and multi-point GNSS localization techniques by conducting a series of experiments over varying distances, analyzing the horizontal and vertical displacement data at specified intervals, and comparing the performance of both methods to determine their accuracy and applicability in different surveying contexts. The study found that the optimal distance between localization points is approximately 1 km for single point localization and can extend up to 2 km when using three points and single point localization is sufficient for distances under 1 km. In conclusion, it indicates that single point localization is sufficient for distances under 1 km, whereas for distances up to 2 km, using three localization points is more effective in ensuring data accuracy and reliability.

Keywords: GNSS (Global Navigation Satellite Systems), RTK method, Precision and Accuracy, Multi Points Reference, Multi-points Localization, Commercial Localization Technique.

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