



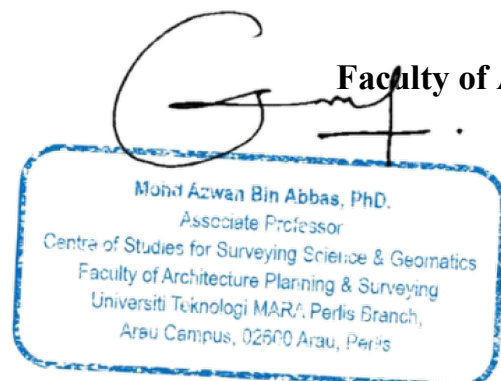
UNIVERSITI TEKNOLOGI MARA

**ANALYSIS OF LEAST SQUARE ESTIMATION
OUTLIERS DETECTION VARIANTS FOR
CADASTRAL NETWORK ADJUSTMENT**

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Thesis submitted in fulfilment of
requirements for the degree of
Bachelor of Surveying Science and Geomatics (Hons)

Faculty of Architecture, Planning and Surveying




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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 and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Currently, Department of Survey and Mapping Malaysia (DSMM) is moving towards positional accuracy improvement (PAI) to enhance the positional accuracy of National Digital Cadastral Database (NDCDB). However, taking into account the multi-classes of cadastral legacy datasets as well as human-intervene projection of land record, outliers filtering procedure has become crucial element in cadastral network adjustment. As of present, there are several approaches available to scrutinize outliers from adjustment procedure such as the Baarda's method, Tau's method, and Danish's method. Relying on commercial adjustment software (i.e., STARNET) has limited the potential of LSA to sensitively identify outliers in the cadastral datasets. This circumstance might significantly affect the reliability of adjusted data, which eventually jeopardize the quality of NDCDB. Therefore, the aim of this study is to mathematically evaluate the effectiveness of Least Square Adjustment (LSA) outlier(s) detection methods in improving land information positioning accuracy. A set of simulated traverse data and six (6) certified plans (CPs) are utilized in this study. Introduced uncertainties then are detected using selection of methods from former studies such as Baarda's, Star*Net's, Tau's and Danish's. A standard procedure is used, in which the weightage for bearings and distances is set to 15" and 0.010m, respectively, and is assigned to each method. The threshold for Baarda is 3.29, while Star*Net, and Danish are 3.00. Tau's method, on the other hand, employs values derived from the tau distribution. These critical values are chosen and compared to each standardised residual after LSE. The standardised residuals are computed by developing a programme in MATLAB and are used to analyse the final result. The findings reveal that the excellent performance of outlier detection when tested on both combination of similar and different survey's classes is demonstrated using Danish's method. This study could contribute to the preserving the positional accuracy for the cadastral database.

Keywords: Outlier Detection, Least Square Adjustment, Positional Accuracy Improvement, Cadastral Network

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