

**UNIVERSITI TEKNOLOGI MARA**

**AN ENHANCEMENT OF TanDEM-X  
DIGITAL ELEVATION MODEL  
(DEM) USING GNSS LEVELLING  
DATA**

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of the requirements for the degree of  
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(Hons)**

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## AUTHOR'S DECLARATION

I declare that the work in this report was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged a referenced work. This report 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 Undergraduate, Universiti Teknologi MARA, regulating the conduct of my study.


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## **ABSTRACT**

Digital Elevation Model (DEM) become a common method of earth surface modeling. DEM defined as a digital representation of the surface elevation concerning to specific reference datum and one of the simplest types of topography representation. It has been widely used for several purposes and studies to get the best analysis and representation of the earth's surface. The last two decades have been prolific in the development of global or near-global DEM derived from satellite platforms. Compare to the conventional method which has several disadvantages such as tedious, time-consuming, and prone to human error, the current technology of global remote sensing acquisition is worth using. The most recent addition to the global remote sensing DEM family is TanDEM-X that has been certified as the most accurate global DEM production. TanDEM-X provides many possibilities for scientific exploration because the distance between satellites is variable and the satellite is very versatile themselves. It includes several purposes of investigation such as land use changing, environmental studies, topographic studies, and remote sensing imaging rectification. However, there are some exceptions and disadvantages of using remote sensing technology for generating the Digital Elevation Model (DEM). Thus, the aim of this study is to enhance the accuracy of the TanDEM-X DEM by using GNSS levelling data. It involves some computation and also several procedures. To achieve the aim, the objectives of this study are comprised of two (2) which are: 1) to determine the accuracy of TanDEM-X DEM and no 2) to improve the accuracy of TanDEM-X DEM by using a parametric model. Several important parts will be determined in this study such as the instrument used, an area covered, a total number of GNSS levelling points, the distribution of GNSS levelling points, the software will be used, and the method of data analysis. This study will help the user to get know the accuracy of the TanDEM-X Digital Elevation Model (DEM) and to improve the Digital Elevation Model (DEM) of the TanDEM-X by using another option and method for further application of DEM, especially in UiTM Perlis.

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