OBJECT BASED IMAGE ANALYSIS OF SUPPORT VECTOR MACHINE AND RULE BASED IMAGE CLASSIFICATION FOR BUILDING EXTRACTION

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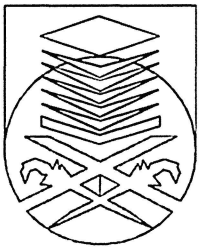

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in partial fulfilment for the award of the degree of the
Bachelor of Surveying Science and Geomatics (Honours)

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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

Building extraction is one of the main procedures used in updating digital maps and geographic information system databases. This is a challenging task in a remote sensing community to extract buildings from high spatial remote sensing imagery because of the spectral similarity between man-made objects such as buildings, parking lots, roads, in the urban areas. This study utilizes Pleiades-1A satellite image data of Shah Alam areas to extract buildings in urban area. The main goal of this study is to demonstrate the capability of object-based image analysis (OBIA) in building extraction from high spatial remote sensing imagery. Different classification approaches, including support vector machine (SVM) and rule-based classification, were applied to the Pleiades-1A. Results show that rule-based classification has a better overall accuracy closeness index with 0.07 while SVM had 0.14 of overall accuracy closeness index. The rule-based classification resulted in fewer buildings that under-segmentation and over-segmentation. The classification accuracy of the result obtained is approximately 95% for SVM and 83% for rule-based classification. The overall accuracy and kappa coefficient for SVM is 95.11% and 93% respectively and the classification accuracy using rule-based image classification shows 83.49% and 76% of overall accuracy and kappa coefficient respectively. The map of building extraction using SVM shows the distribution of building, tree, road, waterbody, land, grass and shadow area are 14%, 19%, 23%, 6%, 12%, 26%, and 0% respectively and the map of building extraction using rule-based image classification shows 26%, 24%, 14%, 3%, 30%, 3% and 0% of building, grass, land, road, tree, water body and shadow area respectively.

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