

ASSESSMENT OF COCONUT TREE CROWN DETECTION USING  
REMOTE SENSING APPROACH

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**Thesis submitted to the Universiti Teknologi MARA Malaysia  
in partial fulfilment for the award of the degree of the  
Bachelor of Surveying Science and Geomatics (Honours)**

**JULY 2024**

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## ABSTRACT

In this thesis, the identification of coconut tree crowns with the help of remote sensing is examined. The problem statement focuses on the difficulties in properly defining the class of coconut tree crowns for the purpose of difference in the image resolution and methods of classification. Thus, the objective of the study is to analyse the performance of a range of ultra metric measures of supervised classification methods such as SVM, RF, and MLC used in the analysis of the Sentinel 2 and SPOT 6 satellite imagery data. The specific objectives are as follows: to compare the effectiveness of these two methods in establishing the locations of coconut trees and other kinds of land covers. Chapter 4 further shows that for the MLC method the overall accuracy was 100 percent with Kappa coefficient of 1.000 for the Sentinel 2A imagery this showing perfect classification. On the other hand, the latter or RF method aligned with the results that present a very low accuracy of 31.5% and comically misplaced the classes. In the case of SPOT 6 imagery, both the MLC and RF classification exercise yielded impressive results with the accuracy levels of 92.3% and the Kappa coefficient of 0.859, thus this is an indication of the role played by image resolution and classification techniques in establishing high accuracy levels. The conclusion at chapter 5 is declaring that both SVM and MLC methods are more accurate than RF in the classification of tree crown on different satellite image data. Since correct classification of the land cover is significant, the study focuses on the relevance of having correct classification techniques and high-resolution images for the classification of the land cover, which will serve as a guide for further study and utilization in the agricultural sector.

Keyword: Object-Based, Pixel-Based, Supervised Classification, Support Vector Machine, Random Forest and Maximum Likelihood.

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