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COMPARISON OF MACHINE LEARNING ALGORITHMS FOR ESTIMATING MANGROVE AGE USING SENTINEL 2A AT PULAU TUBA, KEDAH, MALAYSIA

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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

February 2021

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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Thesis/Dissertation Title	:	Comparison of Machine Learning Algorithms for Estimating Mangrove Age using Sentinel 2A at Pulau Tuba, Kedah, Malaysia.

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ABSTRACT

Mangroves forest are important in providing services and goods to its surrounding and environment. There are differences in mangrove age for each tree and according to previous studies the factors that cause the differences in the age class is because of lightning and it is more frequent in the mature forests and in the zone that are protected. The studies on mangroves age estimation are rare and limited even though there are many studies on mangroves species and the deforestation of mangroves in Malaysia.

Therefore, this study aimed to used OBIA method with selected machine learning algorithm to estimate the mangrove age by using Sentinel 2A image. The parameters involved to estimate the mangrove age are differences feature selection and different supervised machine learning algorithm.

The support vector machine (SVM) which is one of the machines learning algorithms for object-based image analysis (OBIA) method is used in this study for the classification of the mangrove from other LULC. The supervised machine learning algorithm, SVM and Decision Tree are used for the estimation of the mangrove age into young and mature. The study used Sentinel 2A images which is one of the high-resolution satellite images that is used for monitoring the changes of mangrove forest in previous studies and it is used in this study in evaluating mangroves age. The results of the age estimation shows that SVM classifier are more suitable for age estimation than Decision Tree with SVM obtaining higher accuracy than DT.

Overall, this study has a great potential for the future management of mangroves forest in Malaysia. The significant of this study is to prove that the application of object-based image analysis classification in evaluating mangroves age are suitable and have great potential for the future management of mangroves forest in Malaysia especially in Pulau Tuba, Kedah. Furthermore, the mangroves age map can help to analyse the age of the mangroves in order to maintain its existence and growth.

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