

**IMPLEMENTASI YOLOV3 UNTUK MODEL DETEKSI TANAMAN
KELAPA SAWIT FASE TANAMAN BELUM MENGHASILKAN
MENGUNAKAN FOTO UDARA
(Studi Kasus : PT Mustika Sembuluh 1, Kabupaten Kotawaringin Timur,
Kalimantan Tengah)**

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INTISARI

Kelapa sawit merupakan komoditas strategis di Indonesia, yang berperan penting dalam sektor pertanian dan perekonomian negara. Pemantauan kondisi tanaman kelapa sawit pada fase Tanaman belum Menghasilkan (TBM) menjadi krusial untuk memastikan kebun *replanting* dapat mencapai hasil maksimum di masa depan. Penelitian ini berfokus pada pengembangan model pembelajaran mendalam untuk mendeteksi kelapa sawit pada fase Tanaman Belum Menghasilkan (TBM), yang berfungsi sebagai dasar untuk Evaluasi Berbasis CPA, sebuah pendekatan penting dalam mengevaluasi tahap pertumbuhan yang sangat penting untuk melihat proyeksi hasil panen di masa depan. Model dilatih dengan input gambar chip foto udara dari setiap usia bulan kelapa sawit. Model dilatih menggunakan Jupyter Notebook, dan mendapatkan akurasi AP 81.6%. Melalui evaluasi performa model, diperoleh hasil akurasi sebesar 93,86%, presisi 96,62%, *recall* 97,07%, dan F1 Score 96,82% untuk seluruh usia bulan tanaman. Implementasi model dilakukan pada perkebunan kelapa sawit beberapa usia pada fase TBM dan hasil pemetaan dan evaluasi kondisi tanaman dipresentasikan menggunakan *Dashboard* ArcGIS Online, yang menyajikan peta interaktif, grafik, dan informasi lain terkait distribusi tanaman dengan nilai CPA di bawah rata-rata, yang berguna untuk menentukan prioritas pengecekan langsung oleh agronomis di kebun.

Kata Kunci : YOLOv3, Kelapa sawit, *Replanting*, Tanaman Belum Menghasilkan, *Crown Projection Area*.

**IMPLEMENTATION OF YOLOV3 FOR OIL PALM PLANT DETECTION
MODEL IN THE IMMATURE GROWTH PHASE USING AERIAL
IMAGERY
(A case study : PT Mustika Sembuluh 1, East Kotawaringin Regency,
Central Kalimantan)**

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ABSTRACT

Oil palm is a strategic commodity in Indonesia, playing an important role in the country's agricultural sector and economy. Monitoring the condition of oil palm plants in the Immature phase is crucial to ensure that replanted plantations can achieve maximum yields in the future. This research focuses on developing a deep learning model for detecting oil palm in the Immature phase, which serves as the basis for CPA-Based Assessment, an important approach in evaluating growth stages that are crucial for future yield projections. The model was trained with input aerial photo chip images of each month age of the oil palm. The model was trained using Jupyter Notebook, and obtained an AP accuracy of 81.6%. Through the model performance evaluation, the accuracy of 93.86%, precision of 96.62%, recall of 97.07%, and F1 Score of 96.82% were obtained for the entire age of the plant month. The implementation of the model was carried out on oil palm plantations of several ages in the immature phase and the results of mapping and evaluation of plant conditions were presented using the ArcGIS Online Dashboard, which presents interactive maps, graphs, and other information related to the distribution of plants with below-average CPA values, which is useful for determining the priority of direct checking by agronomists in the plantation.

Keywords : YOLOv3, Oil Palm, Replanting, Immature Phase, Crown Projection Area.