

Mi-FFB Harvest

Mi-FFB Harvest is an AI-powered automated system for Fresh Fruit Bunch (FFB) harvest-readiness characterisation in oil palm plantations. The system integrates advanced computer vision, deep learning models, and drone-based imaging to detect, classify, and record the maturity status of FFBs in real time.

It enables consistent, objective, and efficient assessment of FFB maturity, reducing reliance on manual inspection and improving harvesting operations.



Technology Overview

Mi-FFB Harvest identifies and classifies oil palm trees for harvest readiness using machine learning-based computer vision. It detects the presence of loose fruitlets on the ground in the vicinity of the tree as well as indicates the tree location on a semantic map representing an actual plantation area.

This aids plantation owners to deploy workers to trees ready for harvesting, saving time and increasing labour productivity.

Technology Benefits

- **Accurate & Consistent:** AI-driven models reduce reliance on manual inspection, eliminating subjectivity and improving harvesting operations.
- **Near Real-Time Insights:** Classification results are processed directly on the device and updated instantly for immediate access.
- **Operational Efficiency:** Reduces missed harvest-ready trees to maximise yield recovery.
- **Scalable Deployment:** Easily integrates with various drone platforms and adapts to plantations of different sizes.
- **Optimised Harvesting:** Database-driven planning enables efficient allocation of harvesting crews.
- **Flexible Integration:** Complements existing plantation monitoring and mapping systems.

Key Features

Tree ID Generation

Generates unique GPS-based Tree IDs by mapping individual palm trees using above-canopy drone imagery and linking them to plantation maps.

Ground-Level Drone Operation

Performs under-canopy drone flights for close inspection, tracking tree positions via GPS and orientation, and accurately matching each observed tree to its assigned Tree ID.

Harvest-Readiness Classification

Uses RGB and multispectral imaging with deep learning models to assess physical maturity traits, classify FFBs into Unripe, Underripe, or Ripe categories, and operate reliably under diverse lighting and environmental conditions.

Palm Tree Database

Maintains a centralised database of Tree IDs, GPS locations, and harvest status that is automatically updated with each classification event and seamlessly integrates into plantation management systems.

Applications

- **Plantation Harvest Planning:** Helps prioritise which trees to harvest first based on ripeness.
- **Yield Optimisation:** Reduce missed or mistimed harvests to get the most produce.
- **Field Workforce Management:** Directs workers to specific trees that are ready for harvesting.
- **Drone-Assisted Plantation Monitoring:** Automates inspections across the plantation for faster and scalable monitoring.

HARVEST-READINESS STATUS CHARACTERISATION: MI-FBB_HARVEST

