

Thesis Title	Artificial Intelligence Models for Variety and Maturity Classification of Thai Commercial Mangoes
Author	Phanuphong Suthawas
Degree	Master of Science (Digital Transformation Technology)
Advisor	Assistant Professor Sujitra Arwatchananukul, Ph. D.
Co-Advisor	Associate Professor Nattapol Aunsri, Ph. D.

ABSTRACT

Thailand is one of the world's largest mango producers and exporters, where traditional grading methods rely on farmers assessing characteristics like color, texture, size, and shape. These methods, however, can be inconsistent. This study presents an AI-driven approach for automated mango classification, consisting of two stages: variety classification using a Random Forest classifier and maturity classification using machine learning and deep learning models. The Random Forest classifier, after hyperparameter tuning, achieved a remarkable accuracy of 99.63% for mango variety classification. Following this, mangoes are categorized into three maturity grades: Immaturity (M1), Exporting Maturity (M2), and Domestic Maturity (M3). The highest maturity classification accuracies were 80.00% for Mahachanok using InceptionV3, 84.40% for Namdokmai Sithong using Gradient Boosting, and 83.33% for R2E2 using Random Forest. Both models were integrated into a real-time web application, providing an efficient and scalable solution for mango classification, improving consistency and productivity in the agricultural sector.

Keywords: Maturity, Variety, Prediction, Machine Learning, Deep Learning, InceptionV3, Random Forest, Classification