## IDENTIFIKASI TINGKAT KESEGARAN BUAH STROBERI BERDASARKAN WARNA DAN TEKSTUR MENGGUNAKAN METODE

KNN DAN LAPLACIAN FILTER Identification of Strawberry Freshness Level Based on Color and Texture Using KNN and Laplacian Filter Methods Qonitatul Hasanah, S.ST., M.Tr,T as Academic Supervisor

## Lukas Raden Arya Jatayu

Study Program Informatics Engineering Majoring of Information Technology

## ABSTRACT

This study aims to develop a system for identifying the freshness level of strawberries based on color and texture using the K-Nearest Neighbor (KNN) and Laplacian Filter methods, implemented in a Flutter-based mobile application. The system is designed to address the inefficiencies of manual strawberry freshness classification. The dataset consists of 500 strawberry images (250 fresh, 250 rotten) sourced from Kaggle, split into 80% training data and 20% testing data. Image processing includes background removal, RGB to grayscale conversion, and feature extraction of RGB color, texture (Gray Level Co-Occurrence Matrix), and edge detection using Laplacian Filter. Classification using the KNN algorithm with k=5 achieves an accuracy of 94% based on the system's confusion matrix and 97% based on manual calculation. The application allows users to upload or capture strawberry images for freshness identification. System testing using blackbox testing confirms functionality aligns with specified requirements. However, limitations include a limited dataset and suboptimal background removal for images with stems. This study is expected to assist farmers and the community in identifying strawberry freshness automatically, quickly, and accurately.

**Keywords**: Strawberry Freshness Identification, Machine Learning, K-Nearest Neighbor (KNN), Gray Level Co-Occurrence Matrix (GLCM), Mobile Application, Flutter Framework.