APPLYING CONVOLUTIONAL NEURAL NETWORKS (CNN) FOR THE IDENTIFICATION OF TOMATO RIPENESS

(Case Study: Poktan Welan Asri Petinggen Garden Tour, Yogyakarta Special Region)

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ABSTRACT

The identification of tomato ripeness is crucial in agriculture to ensure quality and minimize spoilage. A common challenge arises from human visual observation of tomato fruit, which can hinder the efficiency of the tomato picking process. Additionally, tomatoes that are not yet ripe may be harvested prematurely. To address this issue, we propose the development of a convolutional neural network (CNN)-based application designed to identify tomato ripeness based on color. The CNN-based system categorizes tomatoes into ripe and unripe classifications. Images were captured while the tomatoes were still attached to the plant stalk, resulting in a dataset of 1,000 tomato images obtained from Kaggle and the research site. This dataset is divided into 700 training images, 150 testing images, and 150 validation images. The experimental design employs a CNN model that incorporates image processing techniques such as resizing, labeling, and data augmentation. The final results from the testing data achieved an accuracy level of 96.67%.

Keywords: Human Visual Observation, Identification, Tomato Ripeness, Plant Stalks, and CNN