

ABSTRACT

Assessing the freshness level of perishable vegetables and fruits is a crucial process in maintaining the quality of household consumption and food distribution chains. This study aims to develop an automatic classification model capable of predicting the freshness level of vegetables based on visual data. The method used combines Convolutional Neural Network (CNN) for extracting spatial features from images and Long Short-Term Memory (LSTM) for capturing temporal patterns from sequential data. The dataset was collected independently by photographing vegetables every few hours over a specific period. The freshness level of vegetables is categorized into three classes: fresh, less fresh, and not fresh. The results show that the best-performing model achieved an accuracy of up to 93.4% and a Mean Absolute Error (MAE) of 0.46 days. This indicates that the model can effectively classify vegetables into the three freshness categories with high accuracy. The developed model holds potential for integration into mobile applications to assist consumers, such as housewives, in selecting fresh vegetables while shopping. It is hoped that this research can increase efficiency and objectivity in the process of assessing vegetable freshness and can reduce the volume of national waste.

Keywords— CNN-LSTM, deep learning, image classification, image recognition, vegetable freshness, visual prediction..