

ABSTRAK

PENERAPAN METODE *LEARNING VECTOR QUANTIZATION* (LVQ) MENGUNAKAN KAMERA PADA SISTEM KLASIFIKASI KEMATANGAN BUAH PEPAYA *CALIFORNIA*

(2026 : + xviii + 78 Halaman + 46 Gambar + 7 Tabel)

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Pepaya California merupakan salah satu komoditas buah yang banyak dibudidayakan dan dipasarkan, sehingga diperlukan sistem yang mampu menentukan tingkat kematangan buah secara akurat dan objektif. Penentuan kematangan secara manual masih memiliki kelemahan, seperti ketergantungan pada penglihatan manusia dan hasil yang tidak konsisten. Oleh karena itu, laporan akhir ini membahas perancangan sistem klasifikasi kematangan buah Pepaya California berbasis *Internet of Things* (IoT) menggunakan kamera dengan metode *Learning Vector Quantization* (LVQ). Sistem dirancang dengan memanfaatkan kamera sebagai sensor untuk mengambil citra buah, yang kemudian diproses guna mengekstraksi fitur warna sebagai parameter penentu tingkat kematangan. Proses klasifikasi dilakukan menggunakan metode LVQ yang termasuk dalam kategori jaringan saraf tiruan terawasi (*supervised*). Hasil klasifikasi selanjutnya dikirimkan melalui sistem IoT sehingga dapat dipantau secara jarak jauh. Sistem ini diharapkan mampu mendukung proses sortir buah secara otomatis, efisien, dan konsisten, serta berkontribusi pada penerapan teknologi cerdas di bidang pertanian.

Kata Kunci:

Pepaya *California*, Klasifikasi Kematangan Buah, *Internet of Things* (IoT), Kamera, *Learning Vector Quantization* (LVQ)

ABSTRACT

APPLICATION OF LEARNING VECTOR QUANTIZATION (LVQ) METHOD USING CAMERAS IN CALIFORNIA PAPAYA FRUIT RIPENESS CLASSIFICATION SYSTEM

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California papaya is one of the fruit commodities that is widely cultivated and marketed, so a system is needed that is able to determine the level of ripeness of the fruit accurately and objectively. Manual determination of maturity still has drawbacks, such as reliance on human vision and inconsistent results. Therefore, this final report discusses the design of a classification system for the ripeness of California Papaya fruits based on the Internet of Things (IoT) using a camera with the Learning Vector Quantization (LVQ) method. The system is designed by using a camera as a sensor to take images of the fruit, which is then processed to extract color features as a parameter determining the level of ripeness. The classification process was carried out using the LVQ method which is included in the category of supervised artificial neural networks. The results of the classification are then sent through the IoT system so that they can be monitored remotely. This system is expected to be able to support the fruit sorting process automatically, efficiently, and consistently, as well as contribute to the application of smart technology in agriculture.

Keywords:

*California Papaya, Fruit Ripeness Classification, Internet of Things (IoT),
Cameras, Learning Vector Quantization (LVQ)*