ABSTRAK

Penelitian ini bertujuan untuk membandingkan efektivitas dua metode segmentasi citra yang berbeda yaitu Deteksi Tepi *Canny* dan *Thresholding Otsu* dalam melakukan segmentasi citra buah naga. Segmentasi citra merupakan langkah krusial dalam sistem pengolahan citra untuk analisis kualitas buah. Dengan menggunakan bahasa pemrograman *python.* Dalam pengolahan data *(Data Processing)* data mentah dibersihkan dan dipersiapkan untuk analisis lebih lanjut. Pada tahap membangun model *(Building Model)* di mana model prediktif atau analitis dibangun menggunakan data yang telah diproses. Selanjutnya, model tersebut melewati tahap evaluasi *(Evaluation)* untuk mengukur kinerjanya berdasarkan metrik tertentu (skenario). Untuk mengukur kinerja metode deteksi tepi *Canny* dan *Thresholding Otsu* digunakan parameter *Mean Squared Error* (MSE) dan *Peak Signal to Noise Ratio* (PSNR). Setelah dievaluasi menggunakan parameter MSE dan PSNR diperoleh: segmentasi citra buah naga menggunakan metode deteksi tepi *Canny* menghasilkan nilai rata-rata PSNR 5,34 dB dan MSE 21649,21. sedangkan metode *Thresholding Otsu* menghasilkan nilai rata-rata PSNR sebesar 10,95dB. Dan nilai MSE sebesar 6546,64. Berdasarkan nilai MSE dan PSNR segmentasi citra pada buah naga menggunakan metode deteksi tepi *Canny* dan *Thresholding Otsu* dapat disimpulkan bahwa metode *Thresholding Otsu* lebih optimal dibandingkan metode deteksi tepi *Canny* dalam segmentasi citra buah naga, terutama jika ditinjau dari parameter kualitas MSE dan PSNR.

Kata Kunci: Segmentasi Citra, Deteksi Tepi *Canny*, *Thresholding Otsu*, *Mean Squared Error* (MSE), *Peak Signal-to-Noise Ratio* (PSNR).

ABSTRACT

This study aims to compare the effectiveness of two different image segmentation methods, namely Canny Edge Detection and Thresholding Otsu, in segmenting images of dragon fruit. Image segmentation is a crucial step in image processing systems for fruit quality analysis. Using the Python programming language, in the data processing stage, raw data is cleaned and prepared for further analysis. The building model stage involves constructing predictive or analytical models using the processed data. Subsequently, the model undergoes an evaluation stage to measure its performance based on specific metrics (scenario). To evaluate the performance of the Canny Edge Detection and Thresholding Otsu methods, the parameters Mean Squared Error (MSE) and Peak Signal-to-Noise Ratio (PSNR) were used. After evaluation using MSE and PSNR parameters, the following results were obtained: dragon fruit image segmentation using the Canny Edge Detection method yielded an average PSNR of 5.34 dB and an MSE of 21,649.21, while the Thresholding Otsu method produced an average PSNR of 10.95 dB and an MSE of 6,546.64. Based on the MSE and PSNR values for dragon fruit image segmentation using Canny Edge Detection and Thresholding Otsu, it can be concluded that the Thresholding Otsu method is more optimal than the Canny Edge Detection method for segmenting dragon fruit images, particularly when considering the quality parameters of MSE and PSNR.

Keywords: *Image Segmentation, Canny Edge Detection, Otsu's Thresholding, Mean Squared Error (MSE), Peak Signal-to-Noise Ratio (PSNR).*