



UNDERGRADUATE THESIS

IMPLEMENTATION OF *LOCAL BINARY PATTERN HISTOGRAM* AND *K-NEAREST NEIGHBOR* IN THE CLASSIFICATION OF POTATO LEAF DISEASE IMAGES

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2026**

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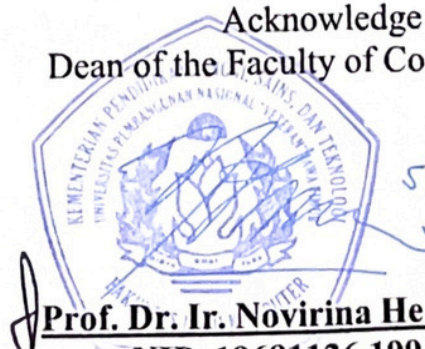
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STATEMENT OF ORIGINALITY

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Stating that in this scientific document this Thesis there is no part of other scientific works that have been submitted to obtain an academic degree in a Higher Education institution, and also there are no works or opinions that have ever been written or published by other people/institutions, except those that are cited in writing in this document and mentioned in full in the bibliography.

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ABSTRACT

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Potato leaf diseases can reduce the quality and quantity of crop yields, making fast and accurate identification essential. Manual identification performed by farmers still has limitations because it depends on experience and subjective visual observations. This study aims to identify potato leaf diseases using the Local Binary Pattern Histogram (LBPH) method for feature extraction and the K-Nearest Neighbor (KNN) algorithm for classification. The dataset consists of three classes, namely Early Blight, Late Blight, and Healthy, obtained from Kaggle. The research stages include image preprocessing through resizing and grayscale conversion, feature extraction using LBPH, and classification using KNN with K values of 3 and 5. Model performance was evaluated using a confusion matrix and classification accuracy. The results indicate that the LBPH method is capable of extracting texture characteristics from potato leaf images effectively, providing representative features for the KNN classifier. Based on the evaluation results of Recall 83.31%, Precision 90.52%, and F1-Score 81.02%, the KNN model with K = 3 achieved better performance than K = 5, which is 83.59%. The findings demonstrate that the combination of LBPH and KNN can be utilized to support automatic potato leaf disease identification and produce satisfactory classification performance.

Keywords: *Potato Leaf Disease, Local Binary Pattern Histogram, K-Nearest Neighbor, Digital Image Processing, Classification.*

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Finally, with all the limitations that the author has, hopefully this report can be useful for all parties in general and the author in particular

Surabaya, June 11, 2026

Author

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