

CHAPTER V

CONCLUSION

This chapter contains a conclusion that discusses the conclusions obtained from the research and provides suggestions that can be used as a reference for future research. The conclusion section presented is a summary of the research that has been discussed in the previous chapters, as well as answering questions in the formulation of the problem. In addition, the suggestions provided aim to provide an outline for future research development, both in terms of methods and the scope of topics that can be researched.

5.1. Conclusion

Based on the results of the discussion in Chapter IV, several conclusions were obtained from the research on the classification of potato leaf diseases using the K-NN algorithm based on the texture features of HSV-LBPH. The conclusions obtained are then described as follows:

1. The application of the potato leaf disease classification model was developed by combining the extraction method of HSV and LBPH texture features and classification using *the K-Nearest Neighbor* (K-NN) algorithm. HSV is used for feature extraction in each dataset in three classes that use three components to support the clearer image to be classified. Then the extracted image is stored in a labeled folder and then the results are trained to produce a qualified classification. The classifier uses two K-values as the tester. The results of the evaluation will be displayed in the confusion matrix.
2. The application of HSV-LBPH and KNN in the classification of potato leaf images is carried out through several stages, namely leaf image acquisition, pre-processing (resize and noise reduction), conversion of RGB images to HSV, application of LBP on channels H, S, and V, formation of HSV-LBPH histograms, preparation of feature matrix X and label vector y, model training using KNN, prediction of new images based on the nearest neighbors, and evaluation using the confusion matrix, accuracy, precision, recall, and F1-score.

3. The final results and analysis in this study are HSV-LBPH and KNN are able to classify diseases in potato leaf images. In this study, two K values were used to get the maximum comparison of results. Before getting the final accuracy results, the author also obtained a Macro Average value displayed on the *Recall*, *Precision*, and *F1-Score* scores in each K value. So that the final accuracy results are 82.35%. Then for the K = 5 value, the results of Recall were 83.31%, Precision 90.52%, and F1-Score 81.02%. So that the final accuracy was 83.59%. So that the best results can be taken to conduct the test, namely using the value of K = 5. Looking at the final results of this study, the authors concluded that HSV-LBPH and KNN were able to be used to classify diseases in potato leaf images.

5.2. Development Suggestions

Here are some suggestions aimed at further research development.

1. It is recommended to use a larger and more diverse dataset so that the model can learn from more imagery variations and improve generalization capabilities.
2. It is recommended to explore the use of other feature extraction algorithms to identify more complex image texture patterns.
3. In the preprocessing section, you can try to add some processes to improve the quality of the data used for model training. The addition of techniques or processes that can be tried to make color and texture features easier to recognize by the model.