

ABSTRACT

Chili pepper (Capsicum sp.) is an important commodity in Indonesia's agricultural sector that plays a major role in the economy. However, chili cultivation faces challenges from disease attacks that cause a decrease in production. Currently, disease identification in chili plants is still done manually. The manual approach not only consumes a lot of time, but also relies on individual expertise, thus increasing the possibility of errors in identification and delays in handling. Therefore, a faster and more accurate automatic detection system is needed to help farmers identify diseases in chili plants.

The classification of diseases in chili plants in this study is divided into three classes, namely: Healthy Leaf, Mosaic Curl, and Gemini Virus. This research develops deep learning using Convolutional Neural Network (CNN) and Bidirectional Long Short-Term Memory (BiLSTM) algorithms equipped with data augmentation with Keras library. To manage the overall system development process, the Cross-Industry Standard Process for Data Mining (CRISP-DM) methodology was used. This method has six main phases, namely business understanding, data understanding, data preparation, modeling, evaluation, and deployment to ensure systematic data processing.

The evaluation results show that the CNN model achieved 95% accuracy with a hamming loss value of 0.0476, while the Bi-LSTM model achieved 86% accuracy with a hamming loss value of 0.1429. The CNN model shows better classification performance than Bi-LSTM in detecting diseases in chili plants.

Keywords: *Augmentation, Bidirectional Long Short-Term Memory, chili plant, Convolutional Neural Network, CRISP-DM, Keras.*