ABSTRACT

Rice is the main commodity crop in several regions of the Asian continent that can produce the staple food of consumption in the form of rice. Paddy production in Indonesia for 2021 is 54.42 million metric tons of (GKG). If converted into rice, rice production in 2021 will reach around 31.36 million metric tons. One of the causes of decreased yields is disease attacks on rice, which inhibit growth, reduce grain quality, and even kill the plants, so efforts to maintain quality rice production are needed. With the development of technology in image processing, there are various methods for detecting and classifying objects, one of which is the use of satellite imagery, and a system for detecting diseases in rice leaves can also be created using Matlab. The detection system created will use image segmentation with the fractal method, which can be used, and the classification that is widely used. K-Nearest Neighbor will detect the three types of diseases that are most often found in rice in Indonesia, namely Blast, bacterial leaf blight, and tungro. To obtain the unique characteristics of each piece of data, the image is processed using the fractal method, which will then calculate the closest distance to the data for training and the data to be tested using the KNN classification. The way KNN works begins by determining the K parameter (number of nearest neighbors), then calculating the square of the distance of each object to the sample data. The image data that will be used is resized to 512 x 512 pixels. The results of the experiment used 900 datasets with a ratio of 80% of the training data to 20% of the test data. From the tests carried out, it was determined that the highest accuracy rate was 87.2%, which was found in the K=1 parameter using the 16 fractal with a computation time of 5.7 seconds.

Keywords: Fractal, K-Nearest Neighbour (KNN), Matlab, Rice Leaf Disease.