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APPLICATIONNEURAL NETWORK PROBABILITYIN THE CLASSIFICATION OF BANANA FIT FOR EXPORT

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ABSTRACT

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As food, bananas are a source of energy (carbohydrates) and minerals, especially potassium. Almost all ripe bananas are yellow, although some are orange, red, green, purple or almost black. In agriculture, to determine the type of fruit and the quality of the fruit, it can be determined by checking the size of the fruit, the shape of the fruit and the color of the skin of the fruit.Classification of types of bananas using the neural network probability method(PNN) as a method of classifying types of bananas that are suitable for export and suitable for domestic consumption with 750 training data and 250 testing data with categories of three types of bananas namely Ambon bananas, Barangan bananas and Kepok bananas and produces an accuracy of 85.2 %.

Keywords: Classification, Banana Fruit, Neural Network Probability (PNN)

1. INTRODUCTION

Bananas are fruit plants that contain lots of vitamins, minerals and carbohydrates. Banana is one of Indonesia's mainstay fruits and has made a significant contribution to national fruit production. As food, bananas are a source of energy (carbohydrates) and minerals, especially potassium. Almost all ripe bananas are yellow, although some are orange, red, green, purple or almost black. Indonesia is the largest banana producer in Asia, because 50% of Asian banana production is produced by Indonesia. Therefore, bananas have been designated as one of the national superior fruit commodities. So that many countries receive banana exports from Indonesia.

The probability neural network method has the best results, because it has a significant level of classification accuracy in image recognition, therefore this study uses the probability neural network (PNN) method.The purpose of this study is to classify bananas suitable for export by applying the methodprobability neural network (PNN).

2. METHOD

2.1 Data Used

In this study, the data used are images of 1000 bananas obtained from photos using a smartphone camera with a distance of 15cm and each image has a JPG/JPEG extension, the banana is a type of banana in North Sumatra consisting of three types of bananas, namely Ambon bananas, Barangan bananas. and banana kepok. Which bananas will be divided into 25% is training data and 75% is testing data.

Table 1. Datasets Used

No.	Dataset	Amount of data
1.	Training Data	750
2.	Testing Data	250
Total		1000

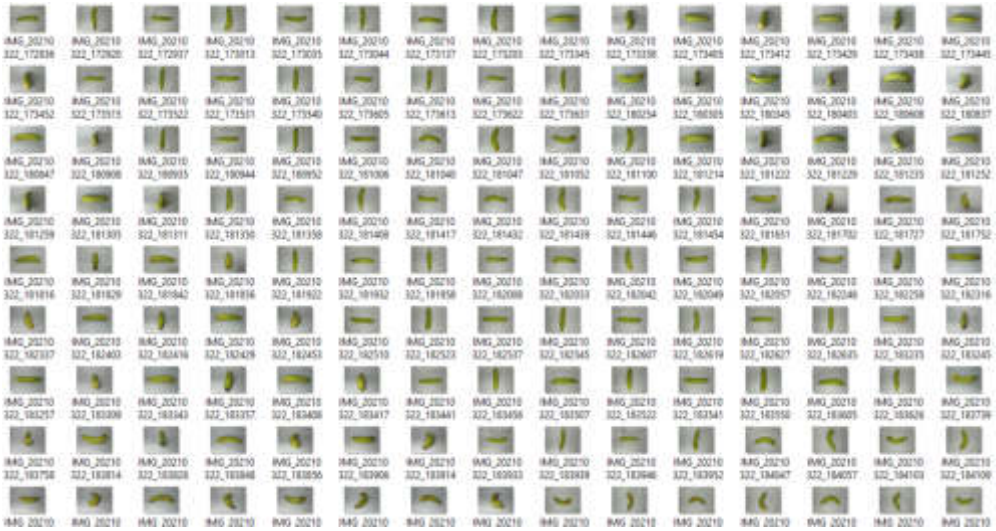


Figure 1. Image Data

2.2 General Architecture

In order to make it easier to conduct research, there is a need for a general architecture that helps design and build the classification of export-worthy bananas with the following methods:neural network probabilityThe general architecture can be seen in the image below:

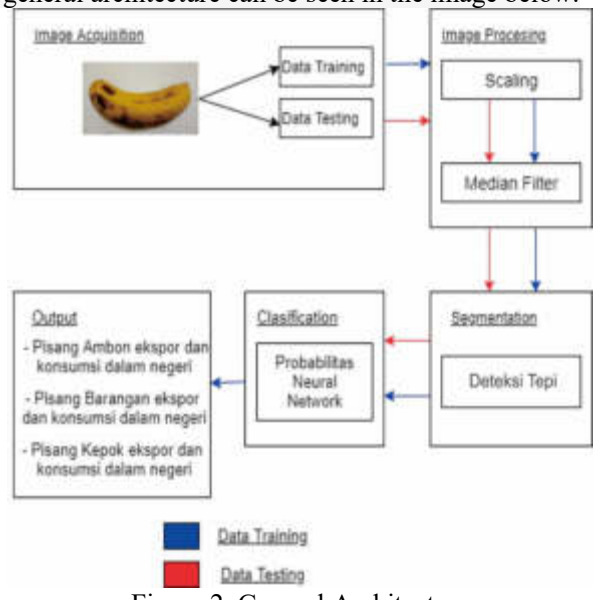


Figure 2. General Architecture

3. RESULTS AND DISCUSSION

3.1 Test Results

The implementation of the system built in the classification of export-worthy banana species using the Probabilistic Neural Network (PNN) method, the system implementation stage starts from image processing consisting of scaling and median filter, then goes through the stemming stage by applying edge detection and ends with the calculation of the Probabilistic Neural algorithm. Network (PNN), all stages are implemented into the matlab programming language.

1. Scaling Process.
   The scaling stagedetermine the pixel size of the image by adjusting the pixel size of the image. At this stage the entered pixel size is 200 x 200.

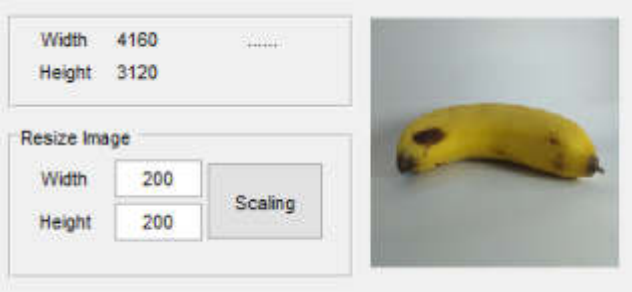


Figure 3. Scaling

2. Median Filter Process
   The median filter stage aims to improve image quality so as to facilitate the classification process of export-worthy bananas.

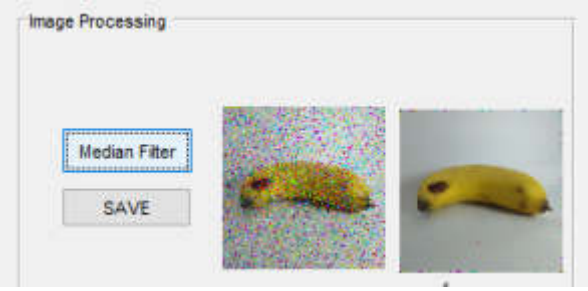


Figure 4. Median Filter

3. ProcessEdge Detection
   The edge detection stage is usually called edge detection, in this study the edge detection used is canny edge detection which aims toimprove the appearance of the boundaries of an area or object in the image.

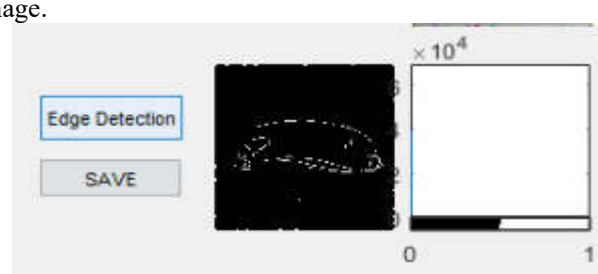
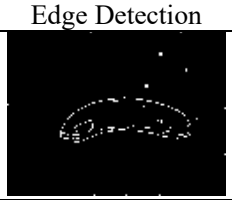
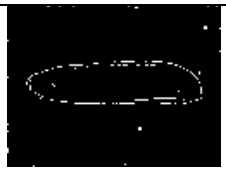
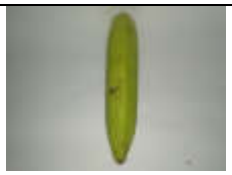
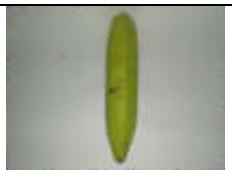
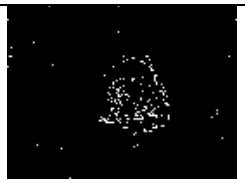


Figure 5.Edge Detection

Table 1. Classification Results

NO	Picture	Results Median Filter	Results Edge Detection	Target
1				Banana Goods for Export

2				Banana Goods for Export
3				Goods Banana Not Eligible for Export
4				Goods Banana Not Eligible for Export
5				Banana of Ambon Export Eligible
6				Banana of Ambon Export Eligible
7				Ambon bananas are not suitable for export
8				Kepok bananas are not suitable for export
9				Kepok Bananas Worth Exporting
10				Kepok Bananas Worth Exporting

4. CONCLUSION

The conclusions from the research on the application of the methodneural network probabilityIn the classification of export-worthy bananas, several conclusions can be drawn including: Classification of bananas with neural network probability algorithm(PNN) as a method of classifying types of bananas that are suitable for export and suitable for domestic consumption with 750 training data and 250 testing data with categories of three types of bananas namely Ambon bananas, Barangan bananas and Kepok bananas and produces an accuracy of 85.2 %. In the image preprocessing process using scaling, median filter and edge detection canny to extract from the image of bananas so as to display the results of bananas suitable for export or bananas for domestic consumption.

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