

CHAPTER 1

INTRODUCTION

1.1. Background

Nowadays, plants have evolved from years ago and many changes have occurred in the structure and use of the plants themselves, especially their leaves. The leaves can be used in cooking, beverages, health, and herbal medicines. However, many leaf shapes are similar to each other, which makes it difficult to recognize the leaves and difficult to determine how to process them. For this reason, it is necessary to research the classification of leaves using edge patterns to identify plant species.

Color-based classification is still very difficult to do because leaves generally have the same color, which is green. For this reason, this research uses leaf patterns to perform classification. The classification was made with 2 methods, the first is combining Canny edge detection and SVM, and the second is classification using only SVM. Support Vector Machine is a classification and regression algorithm that can solve both linear and non-linear problems. SVM is used to find the best hyperplane by optimizing the distance between classes. In this project, canny edge detection is used to maximize the leaf edge pattern.

In this research, the leaf image becomes a data set, then the data set is processed using canny edge detection to clarify the shape of the leaf, and then the leaf image is classified using SVM. The accuracy results of the classification are compared before and after applying edge detection.

1.2. Problem Formulation

Based on the background of the study, the conclusion that the problem formulation in the study was as follows:

1. Does using edge detection can improve the identification process?
2. Can the SVM algorithm classify plants based on edge detection?

1.3. Scope

The scope of this project is to collect datasets in the form of leaf images that will be used as objects in the project. The dataset can be downloaded from Kaggle website. The second scope is to create a program that can classify plant species based on leaf patterns by combining the canny method for detecting leaf edges with the support vector machine algorithm as a classification method. The third scope is to compare the accuracy of the classification process while using Canny Edge Detection and while not using it. And for the last scope is to analyze the effect of kernel and cost parameters on Support Vector Machine in classification.

1.4. Objective

The objective of researchers in this project is to create a program that can classify plant species based on leaf patterns. Another goal is to get the difference in the accuracy of plant species classification results based on leaf edge patterns when combining edge detection and when not using edge detection. The last research objective is to conclude that the SVM algorithm can classify images with the help of leaf edges