HEVEA LEAF FEATURES EXTRACTION AND RECOGNITION ALGORITHM FOR HEVEA CLONES CLASSIFICATION USING IMAGE

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Planting a plant is one of a method to control a current globe temperature. Plant features recognition has been performed by several researchers previously. Wu et al. [1] has performed the leaf recognition by using Probabilistic Neural Network (PNN) in order to classify the plants. As a result Wu et al. [1] was successful developed an efficient algorithm for the plant classification. 32 kinds of plants have been classified by using the algorithm. The basic leaf features considered by the algorithm had been defined by Wu et al. [1] involved diameter of the leaf, physiological length, physiological width, leaf area and leaf perimeter. Moreover, from the basic leaf features, Wu et al. [1] had defined several digital morphological features which are involved smooth factor, aspect ratio, form factor, rectangularity, narrow factor, vein features and perimeter ratio of diameter, physiological length and width. Final result produced by the algorithm is 92.312% of average accuracy and the classification for the leaf was based on the leaf-shape information.

In other hand, Abdolvahab Ehsanirad [2], had did a research to compare Gray-Level Co-occurrence matrix (GLCM) method and Principal Component Analysis (PCA) method intending to classify the plants based on leaf features recognition. 13 kinds of plants with 390 leaves have been tested and successful classified by both methods. Finding from the testing, [2] had declared PCA method is more efficient with accuracy 98% compared GLCM method which only achieved the accuracy at 78%.

However, most of the research findings are focusing on extracting the segmentation on the leaf. By the way, there are stills have several features on the leaf can be considered such as colour and textures. Another reason, there are no other researchers that doing a research on the features of the Hevea leaf. 2011, Abdul Kadir had proposed leaf classification by using shape, texture and colour features [3]. [3] had implemented PNN as a classifier to classify the leaf. He also used a Flavia as a benchmark for his research in order to compare the result and sees the improvement to the PNN. [3] had enhanced the PNN with the new features for recognise the leaf. According [3], the enhancement was produced the impressive result with the accuracy of the recognition 93.75%. However, [3] was used the same data set with the Wu et al. [1]. It means, [3] only tested the proposed method with the same data set and do not test the method with the new data set. He also does not mention that the proposed method had been tested with other data set. Moreover, the successfulness story from [3] does not shown the proposed method be able to solve our problem which we need to recognise the features of Hevea leaf. Although there are many methods and algorithms to recognise leaf features, but the proposed methods and algorithms still have lacking in order to recognise the features in Hevea leaf with the aims to classify it. Further discussion is on the next section.