UNIVERSITI TEKNOLOGI MARA

A NOVEL METHOD FOR CLASSIFICATION OF AGARWOOD OIL USING RADIAL BASIS FUNCTION NEURAL NETWORK

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ABSTRACT

Recently, there has been an increasing number in classifying the quality of Agarwood oil. Several studies have been documented for Agarwood oil applications such as aromatic oils, perfumery ingredient and medicinal practices. Furthermore, the demand of Agarwood oil is very high especially in the Middle East countries. Previously, Agarwood oil quality has been investigated based on tools or feed forward pattern classifier. The boxplot, Q-Q plot and histogram were used to visualize the statistical analysis in this study. The classification technique of Artificial Neural Network (ANN) involved the selection structure of hidden neuron that has been performed simultaneously in Scaled Conjugate Gradient (SCG) algorithm. Several criticisms have been directed towards SCG for its learning speed in selecting the optimal values of network weights. This thesis presents a new model in classifying the quality of Agarwood oil by using pattern classifier technique which is Radial Basis Function Neural Network (RBFNN). This research utilized 96 samples of Agarwood oil and 7 types of chemical compounds. The result of the study demonstrated that the RBFNN has been accurate in clarifying the quality of Agarwood oil. This study identified the 3 number of spread and 100 maximum number of hidden neuron improved the RBF network by achieving lowest mean squared error (MSE) which is $3.37x10^{-26}$ and 100% of accuracy, specificity, sensitivity and precision respectively for the classification of RBFNN. From the experiment show that number of variety ranged number of spread have much better performance compared to SCG technique.

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TABLE OF CONTENT

CHAPTER THREE: THEORETICAL BACKGROUND

CHAPTER FOUR: METHODOLOGY