اونيۏرسيتي تيكنولوڬي مارا

UNIVERSITI
TEKNOLOGI
MARA

THE
DOCTORAL
RESEARCH ABSTRACTS

SIXTH ISSUE

INSTITUTE of GRADUATE STUDIES

Leading You To Greater Heights, Degree by Degree

Faculty of Electrical Engineering

8

Name :
Muhammad Sharfi Najib

Title :
Agarwood Classification Based On Odor Profile Using Intelligent Signal Processing Technique

Supervisor :
Prof. Dr. Hj. Mohd Nasir Taib (MS)

Dr. Nor Azah Mohd Ali (FRIM) (CS)

This thesis presents the classification of Agarwood from Malaysia and Indonesia regions based on signal processing technique. Signal processing for the Agarwood classification is a new area and has yet been actively implemented. In this thesis, the Agarwood has been pre-identified by experts using 32 sensor arrays to measure the Agarwood odor profile. General Agarwood pattern has been plot in 2D diagram. The odor profile from different samples have been normalized and pre-processed and visualized in 3D and 2D plot to find unique patterns. The variation of patterns that has been visualized has been marked as different group samples. From 32 data sensor arrays, several significant data sensor array have been pre-processed using principal component analysis (PCA) as data reduction process. The selected data from PCA are applied as

input to compute sensor centroid for k-NN and ANN model design. To test the robustness of the classification techniques, the data sets are randomized for both k-NN classifier and ANN model. The classification results of the k-NN classifier and the ANN model utilizing significant sensor centroid new features for Agarwood grades and regions. It was found that the k-NN classifier and the ANN model is able to classify 100% of Agarwood grade and region.