UNIVERSITI TEKNOLOGI MARA

DEVELOPMENT OF CAPACITANCE BASED RUBBER TREE LATEX SYSTEM FOR WHITE ROOT DISEASE DETECTION

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ABSTRACT

White root infection to rubber tree is a very common problem faced in rubber industry. Once the tree is infected, it will affect latex productivity and eventually died because of nutrient loss taken by the fungus. Detection method of this infection are usually done by expertise evaluation and a lab test which is not accessible to every rubber tree planters. Thus, due to this fact, this work is done to investigate the detection of white root infection to a rubber tree via rubber latex by measuring its capacitance value with prototype console unit (PCU) developed. Based on the statistical analysis done to 100 normally distributed measurements for healthy and infected samples, there are discrimination between both samples. Discrimination can be seen visually in comparison between error bars and this finding is enforced with the value of paired samples test (p-value) equal to 0.000. An optimized classification model by using ANN is developed and neuron with hidden layer size of 2 is chosen as the best based on accuracy of 82.5% and 5 numbers of connections with threshold of 0.5. Completing this research, a visual interaction system based on optimized model is developed and tested. Based on the 30 samples for each group tested during validation, the system perform considerably good with 78.34% accuracy

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