UNIVERSITI TEKNOLOGI MARA

DEVELOPMENT OF REFLECTANCE INDICATOR USING OPTICAL SENSING ON LATEX

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Thesis submitted in fulfilment
of the requirement for the degree of
Master of Science

Faculty of Electrical Engineering

May 2017

ABSTRACT

Rubber breeding program is initiated by Rubber Research Institute of Malaysia for focusing on the best clone production which relies on the quality of the latex yielding for both latex and latex timber clones and known as RRIM clone series. Even though RRIM had overcome the problem to increase the yield of latex, but the difficulties in differentiating the clone series still prevailing due to lack of information in reference books and required skill from the expertise. Therefore, the objectives are to design measure and discriminate the latex of RRIM clones using optical sensing indicator via reflectance technique. This indicator used Near-Infrared LED to transmit the light and the photodiode will received the reflectance light and converted into voltage. The measured voltage then analyzed using SPSS tool to investigate the discrimination between clones. Based on the analysis, there are three clones (RRIM2002, 2007 and 3001) are distinguished between each other with p-value 0.000. However RRIM2008 and 2014 not distinguished amongst others and could be seen as one group. Yet these two groups are discriminated between each other. By completing the analysis, only four clones were decided to use as an input parameter for ANN toolbox. The best optimized hidden layer size at ±0.5 fixed thresholds was 25 neurons with the testing accuracy of 74.4% and the true positive rate of this case is 73.9% (RRIM2002), 72.2% (RRIM2007), 61.4% (RRIM2008) and 94.1% (RRIM3001). Based on the findings, the objectives to measure latex via reflectance, identify and discriminate the selected RRIM clones series was successfully achieved.

ACKNOWLEDGMENT

First of all, I would like to say Alhamdulillah, for giving me the health and strength to do this research until done. A lot of the parties had contributed their skills, ideas and energy and also their time spend with me during the research.

I would like to extend my gratitude and acknowledge to my main supervisor namely Dr. Nina Korlina Madzhi and not to forget my co-supervisor Assoc. Prof. Dr. Hadzli Hashim. This research cannot be done without their knowledge and guidance. They gave a lot of supports, guidelines, ideas and comments from the beginning until the completion of my research on "Development of Reflectance Indicator using Optical Sensing on Latex".

Special thanks to my beloved parents, Ismail Abas and my late mother Che Noraini Arshad (1955 – 2014) for their encouragements and supports in all time. This piece of achievement is dedicated specially to both of you. Alhamdulillah.

Finally, thank you very much to my friends and RRIM staffs especially Mr. Amran Saari and Mr. Abdul Razak Ahmad, who willing to help me and sharing the priceless assistance. I am extremely thankful to all the persons who I mentioned above for their support in completing this research.

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