INTELLIGENT PADDY RICE COLOR RECOGNITION SUITABLE FOR HARVESTING

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ABSTRACT

This paper presents an automatic recognition of paddy rice color using RGB color extraction. In this work, five sets of paddy rice images from paddy field at Kampung Tua, Semanggol Perak are digitally captured at ICS (Image Capturing Studio) room. The identified regions of interest (ROI) of these paddy's images are processed to quantify the reflectance indices in RGB color model. Paddy rice images are then processed to produce the dominant RGB pixel indices in the primary color model. These reflectance indices gained under standard and controlled environment are then used to design a ANN diagnosis model for paddy rice using MATLAB software. The optimized model is evaluated and validated through analysis of the performance indicators regularly applied in classification models. From the findings, this work has shown that the best model has produced percentage accuracy of 88.75%, 92% specificity and 85.5% sensitivity when measured at 0.1 threshold with a balanced percentage rate of training dataset.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Rice is the dominant staple food of Asia, accounting for more than 70% of caloric intake in some countries. Therefore, paddy research can play a key role in improving quality of the rice produced. In addition, paddy research contributes to improve biotechnology system through several pathways, and these contributions benefit both producers and consumers.

Conventionally, maturity of paddy rice is decided by counting the numbers of days after they are planted. Depending on their varieties, usually harvesting would take into effect between 105 – 125 days where generally 80% of the paddy rice is ripe. "MR 220 padimas" is a type of paddy that has maturity as early as 110 days and is recommended by MARDI [1].

For this type of paddy, the plant starts to produce paddy rice after 60 days from seedling. Within the period of 45-50 days later, the paddy rice becomes ripe. However in large-scale production, period of paddy maturity is inconsistent due to the different cultivating time. Since paddy rice presentation can also be presented in terms of digital images, therefore they can be processed and measured to produce important quantitative features information.

This research proposed that the above selected features information to be used in designing an intelligent decision model for the accurate color features of the matured paddy rice for harvesting. The front end of the model will utilize color index from the paddy rice using the latest image processing technique. Quantified parameters that can represent the best color features are the mean and standard