

Application of Image Processing and Neural Network Technique for Rice Grading

P.L.D. Wasana, P.S.R. Fernando, M.K.A. Lakmal, P.A.A. Illoshini, R.S.I. Wilson and E.M.U.W.J.B. Ekanayake

Department of Computer Science and Technology, Uva Wellassa University, Badulla, Sri Lanka

When considering the agricultural industry, Rice is a principal food source in Asian countries. It is the most commonly and widely used grain in the local consumer market. Thus, analyzing the quality of rice is important. The quality of Rice will depend on the milling. Most mill owners do not have a proper method of measuring the quality of rice. Calculations are currently carried out using the Vernier Caliper in research centers, but it is a time-consuming task. Though there are some machines for automating this process, its usage is very low because of the high cost. Rice can primarily be classified based on colour and shape. Here we analyzed the two genres, *Red Kekulu* rice and *Samba* rice produced by *Bombuwala* rice research center. This paper introduces the rice classification method according to image processing approaches and neural network. Physical characteristics of the grain such as major and minor axis length, perimeter, area, colour and chalkiness are used to classify the rice grains. Identifying broken rice and wastages are the major objectives of the grading system. We have compared the proposed system results with manual measurements and visual observations. Matlab tool is used for image acquisition, preprocessing, segmentation, feature extraction and training the data set. This proposed grading system has scales such as premium, grade A, grade B and it was defined under supervision of rice researchers using broken rice and wastage content. The proposed image processing methods can reduce the time of operation and increase the accuracy. Finally, with the proposed grading system consumers will be able to receive information regarding the quality of the rice.

Keywords: Matlab, Neural network, Physical characteristics, Image processing, Grading system