

Grain recognition based on colour and shape analysis

ABSTRACT

A grain is a small, hard, dry seed, harvested for human or animal consumption. Almost all the grains have similar shape which are small and round, or small and cylindrical. Not only having similar shape, even they are sometimes similar in colours where mostly consist of brown, yellow and white. Thus, it is hard to differentiate the grains especially among manufacturing companies that handle lots of grains to separate them according to their category. This work aims to contribute to an automatic grain recognition using an image-based query instead of a text-based query. Colour Moment and Wavelet Moment are computed as feature vectors and Support Vector Machine (SVM) algorithm is used to classify the grains based on the extracted features. For evaluation of the proposed prototype, 10-fold cross validation experiment is conducted on five Malaysia's most used grains which are corn, rice, wheat, barley, and soya. 80% of the images are used for training whereas the remaining 20% images are used for testing. Based on the conducted recognition accuracy testing, it is shown that the feature extraction method mentioned above has successfully obtained an average of 94.7% classification accuracy for grain recognition.

Keyword: Colour moment; Grain recognition; Support Vector Machine (SVM); Wavelet moment