Introducing new statistical shape based and texture feature extraction methods in the plant species recognition system

Abstract

Plant species recognition system (PSRS) plays important roles in automated agricultural systems. Usually shape and texture based techniques are used at the same time in object recognition problems. Shape based features are important features in image processing literature and also as a method that the human visual system applies to recognize objects Therefore that is a feature representation considered here. In this paper, features such as median, mean, variance and standard deviation (SD) is engaged in shape representation. In addition to shape based features, ROI (region of interest) -entropy average (REA) is introduced to extract texture base features. These two methods are tested on the leaf samples to evaluate the performance of two proposed methods. In addition, in this research NNUGA used for PSRS problem which could increase the accuracy of feed forward neural networks. The results show the outperformance of the two proposed methods for image processing and optimized classifier for classification part. As the classification result, radial basis neural networks (RBFNN), feed forward neural networks (FFNN), neural networks using genetic algorithm (NNUGA) shows 100%, 93%, 97.3% of accuracy respectively .