Abstract

Efficient locating the fruit on the tree is one of the major requirements for the fruit harvesting system. In this paper, automatic segmentation and yield calculation of fruit based on shape analysis is presented. Color and shape analysis was utilized to segment the images of different fruits like apple, pomegranate, oranges, peach, litchi and plum obtained under different lighting conditions. First the input sectional tree image was converted from RGB colour space into the L*a*b colour space. The resultant image was then applied to the algorithm for fruit segmentation. The Edge detection and combination of a circular fitting algorithm was used for the automatic segmentation of fruit in the image. The resultant edge points were then used for fitting the approximate circular shape. The resultant fitted circles were used as a count of total number of fruits in an image. Hundred sectional tree images of different fruits were used for the segmentation and yield measurement. The results indicate that the proposed method can accurately segment the occluded fruits with the efficiency of 98% and the average yield measurement error was found as 31.4 %.
Automatic Segmentation and Yield Measurement of Fruit using Shape Analysis

- Hayashi Shigehiko, Ota Tomohiko, Kubota Kotaro, Ganno Katsunobu and Kondo Naoshi, "Robotic Harvesting Technology for Fruit Vegetables in Protected Horticultural Production", Information and Technology for Sustainable Fruit and Vegetable Production FRUTIC 05, France.

**Index Terms**

Computer Science  
Pattern Recognition

**Keywords**

L*a*b Color Space  
Edge Detection  
Circular Fitting