

Title Automatic defect segmentation of 'Jonagold' apples on multi-spectral images: a comparative study

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Abstract

Several thresholding and classification-based techniques were employed for pixel-wise segmentation of surface defects of 'Jonagold' apples. Segmentation by supervised classifiers was the most accurate, and the average of class-specific recognition errors was more reliable than error measures based on defect size or global recognition. Segmentation accuracy improved when pixels were represented as a neighbourhood. The effect of down-sampling on segmentation accuracy and computation times showed that multi-layer perceptrons were the best. Russet was the most difficult defect to segment, and flesh damage the least. The proposed method was much more precise on healthy fruit.