Title Image fusion of visible and thermal images for fruit detection

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Citation Biosystems Engineering, Volume 103, Issue 1, May 2009, Pages 12-22

Keywords fruit; image fusion

Abstract

Image fusion is the combination of two or more images of a scene to improve visual perception or feature extraction. A thermal image and a visible image of an orange canopy scene were fused to improve fruit detection. Visible images are formed by reflection in the visible spectrum while thermal images are created from thermal radiation. A digital colour camera captured the visible source image and a thermal infrared camera acquired the thermal source image. Because the scene was acquired by two different cameras with different fields of view and spatial resolutions, image registration was performed prior to image fusion. Two image fusion approaches were applied, Laplacian pyramid transform (LPT) and fuzzy logic. Results showed that both image fusion methods improved fruit detection when compared to using the thermal image alone. Based on image fusion evaluation indices, the fuzzy logic approach performed better than the LPT.