**Abstract**

The development of an automated inspection station to grade processing apples includes a conveyor for apple orientation, optics and camera to capture identical images at three predetermined wavebands, a lighting system that illuminates the apple's surface diffusely and image processing algorithms to segment surface defects on apples in real time.

The conveyor oriented apples so that the stem/calyx ends were not visible during image capture. Multi-spectral optics fabricated using a multi-vision linear filter mounted in front of the camera lens provided three different waveband (740, 950 nm and visible) images of apples on a single camera array. Interference filters placed in the optical path provided the different wavebands.

The diameter and height of each apple was measured to estimate the apple's volume. These dimensions and the position of the apple in the image allowed a portion of each image to be defined, the so-called region of interest (ROI). These sub-images made a composite image of the apple's surface.