4

Image processing techniques for computer vision in the food and beverage industries

N. A. Valous and D.-W. Sun, University College Dublin, Ireland

Abstract: The foremost underlying drivers for using image processing technologies are automation and improved rapid operations. Image analysis involves taking measurements of objects within an image, preferably automatically, and assigning them to groups or classes. The objective is to present conventional and more advanced digital image processing techniques that predominantly involve the image analysis class of operations: segmentation, feature selection and extraction, and classification. These approaches will be reviewed from the aspect of illustrating their role and impact in the food and beverage industry.

Key words: computer vision, image processing, segmentation, feature extraction, feature selection, classification.

4.1 Introduction

The explosive growth in both hardware platforms and software frameworks has led to many significant advances in imaging technology. In recent years, researchers have developed several non-contact methods for the assessment/inspection of food and beverage products, overcoming most of the drawbacks of traditional methods such as human inspection. These methods are based on the automatic detection of various image features, which may correlate with attributes related to sensorial, chemical and physical properties. Computer vision coupled with image processing, which includes the capturing and analysing of images, facilitates the objective and rapid two- and three-dimensional (2-D and 3-D) assessment of visual characteristics, as well as characteristics that cannot