A COMPREHENSIVE COMPARISON OF DIFFERENT RGB IMAGE SEGMENTATION TECHNIQUES

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Object identification, as well as non-invasive monitoring and quality assessment, is of utmost importance in a wide variety of processes [1]. E.g. in food industry, the identification, isolation and quantification of defects or spots caused by plagues, diseases and/or improper manipulation represents a critical task, as their presence usually leads to retire entire lots of goods from the market, implying a considerable loss for the manufacturing companies. For this reason, final product Manual Visual Inspection (MVI) has been increasingly resorted to in many and diverse fields of interest. However, to prevent MVI to be biased by both between- and within-inspector variability, it is starting to be replaced by Automatic Visual Inspection (AVI) of RGB images collected along the production chain. AVI implies the comparison between such images and a set of predefined standards, but, when specifically applied for foodstuff analysis, it might not guarantee a satisfactorily high performance, mainly because the target defects are generally randomly distributed over the samples. Alternatively, this so-called *image segmentation* can be accomplished by particular techniques employing the principles of traditional colour and/or texture analysis [2] as well as by multivariate latent variable-based statistical approaches (also known as Multivariate Image Analysis, MIA, methods) [3].

The main aim of this work is to compare the most commonly used of these strategies and, concretely, determine which ones enable the best identification of sound and green areas as well as of scale blemishes on the surface of several orange samples.

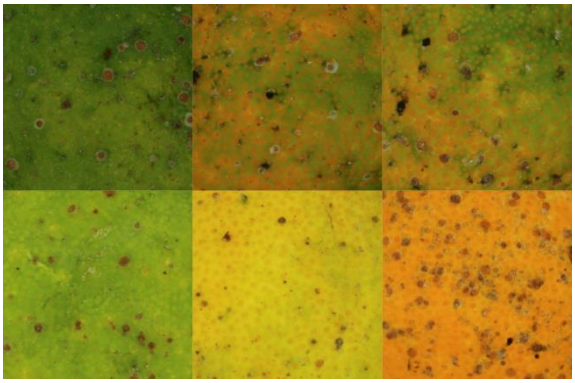

Figure 1 Graphical example of the problem at hand

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