## Abstract

Citrus is one of the most popular fruits around the world. China is the third largest country of citrus yields in the world. In order to improve the competitive ability in the world fruit market, quality detection of post-harvest citrus becomes more and more important. The members in Bio-imaging and Bio-photoelectronic Engineering Lab of Zhejiang University have been engaged in nondestructive external quality detection since 1994 and internal quality detection since 2003 for post-harvest citrus, such as orange, navel orange, mandarin, and so on. Applications of machine vision in automatic detection and sorting of fruits have been widely studied by scientists and engineers. It can not only be result in labor savings, but also improve inspection speed and accuracy. Domestically, an intelligent real-time device, for fruit external quality detecting and grading based on machine vision technology, was firstly developed by our research group in 2003. It can be used to inspect citrus external quality like size, shape, color, and external defects, and classify citrus fruit into different classes with different quality levels according to the detection results. The correctness of citrus classification was above 95% when five quality indices including size, shape, color, green area and external defects were detected synchronously. In recent years, visible/near infrared (NIR) spectroscopy becomes widely studied and applied for fruit internal quality detection because of its advantages of nondestructive, simple, and fast, which make this technology ideally suited for on-line process monitoring and quality control. Soluble solids content (SSC) and acidity are two major indiced for assessing fruit internal quality. By now, many researches were done by the group members, which were focused on citrus internal quality detection using spectroscopy technique and chemometrics. The results shown that visible/NIR spectroscopy is a feasible way for quantitative analysis of SSC and acidity of citrus fruits. And the development of on-line process system for fruit internal quality detection based on visible/NIR spectroscopy technology is going on. In the near future, intelligent real-time device for automatic detection and grading of post-harvest citrus according to both external and internal qualities could be available.