Title Implementation of a Bayesian classifier using repeated measurements for discrimination of tomato fruit ripening stages

Author Jorge I. Aranda-Sanchez, Arturo Baltazar and Gustavo González-Aguilar

Citation Biosystems Engineering, Volume 102, Issue 3, March 2009, Pages 274-284

Keywords tomato; ripening

Abstract

Quality control of postharvest fruits is moving towards substituting traditional sensory testing methods by more reliable quantitative methods. Ripening in fruits, such as tomatoes, is a complex phenomenon which affects chemical and physiological properties as a function of time. Attempts to solve the problem of ripening classification focus mostly on single sensors; however, there is not yet a complete solution. In this work, the use of repeated measurements obtained from two different non-destructive sensors incorporated into a Bayesian classifier for data fusion is proposed. Two independent measurements, from a novel non-destructive acoustic impact technique and from colorimeter sensors, were used. The problem of using repeated measurements to describe the probability density function for each class was addressed. The effect of correlated data and number of sensor characteristics on the artificial classifier was explained by an analysis of classification error. The results showed that the error classification rate is affected by the correlation between repeated measurements. The proposed Bayesian data fusion scheme reaches a classification error of as low as 5%, compared with 25–50% when single sensors are used.