

Quality control of blueberries

Background. Quality inspection of berries, vegetables and fruits is today often based on manual and visual inspection. This means the assessment is subjective, labor intensive and difficult to implement accurately on the whole production volume. Manual lab testing is done on a small sample of product to measure quality parameters such as brix (sugar) content. Machine vision cameras has the potential to automate quality control. By capturing wavelengths beyond regular cameras, hyperspectral cameras obtain the spectral fingerprint of the materials and make it possible to perform chemical analysis in an image.

Objective. In this case we are looking to detect blueberries with defects such as rot using hyperspectral imaging.

Method. For this case study, fresh blueberries containing some rot were scanned using hyperspectral cameras, VNIR (400-1000 nm) and SWIR (1000 - 2500 nm) from HySpex (hyspex.com). On data aquired from the cameras, spectral filters was applied and using spectral visualisation techniques such as PCA, different areas could be selected and labeled as normal or rot. A classification model was trained using machine learning. After validating the model with test data it was applied on several recorded images images and the pixels with rot could be correctly classified and visualized as a color image. The output can be used for performing real-time quality control and sorting of blueberries.

