
Abstract

In 2016 to 2017, the value of Asia's coffee market has increased rapidly with an annual rate of 6% on average. Each region of coffee bean production has its own quality, which will affect the price and flavor. Conducting the sorting process manually will cost a lot of time and probably inaccurate. Therefore, technology will be required to make the selection process faster. We conduct a study to measure the quality of arabica green coffee beans based on their defect level and further classify them into five grades: specialty grade, premium grade, exchange grade, below grade, and off grade, by using the computer vision approach. We use the color histogram and Local Binary Pattern (LBP) to extract color and texture features of arabica green coffee beans. These feature extraction methods could well represent the quality of the beans. For the grade determination process, we compare the performance of Random Forest and K-Nearest Neighbor (KNN). From the experimental result, we successfully showed that the combination of color and texture visual feature and machine learning approach achieved promising results with an accuracy of 87.87% and 80.47%, by using Random Forest and KNN respectively.

Keywords: computer vision, coffee beans, color histogram, local binary pattern, random forest, k nearest neighbor.