COMPARISON OF CLASSER EXTRANEOUS MATTER CALLS AND IMAGE SHAPE AND COLOR MEASUREMENTS

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Abstract

Cotton extraneous matter (EM) calls are the only manual calls still regularly made by AMS classers. In order to develop a machine EM classing system, a better understanding of what triggers a classer EM call is needed. The goals of this analysis were to develop criteria for identifying individual objects as bark/grass and to establish thresholds for assigning EM calls to cotton samples using machine measurements. AMS classers were tasked in identifying EM (bark/grass) in and assigning EM calls to large-area, color images of cotton samples. Image analyses were also used to make shape and color measurements of the trash objects in the sample images that included: shape factors - area, perimeter, bounding rectangle, fit equivalent-ellipse, circularity, aspect ratio, roundness, solidity, Feret's diameter; and color factors - RGB & Lab color space mean, standard deviation, mode, minimum, maximum, median, integrated density. These measurements and classer bark/grass calls were compared and statistically analyzed to reveal correlations. For almost every shape and color factor, there were significant differences (pvalue $\leq$ 0.01) between the average for the EM identified by the classers and the average for the other objects in the images. The differences were greatest for the shape factors. For example, 95% of the classer identified EM had longer equivalent-ellipse major axes (greater than 46 pixels or 0.11 in.) and larger areas (greater than 346 sq. pixels) than the other objects in the images. Further analyses of these data should provide thresholds for shape and color factors that will aid in machine classing cotton EM.