Modeling and Optimization of some optical properties of cowpea seeds for Automation Sensing Operations.

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Abstract

Artificial intelligent and automation are the modern trends to industrial development. The objective of this study is to determine, model and optimize some optical properties of bulk cowpea grains varieties relevant for automation. Three varieties with five moisture levels were used. Colour properties were determined using chroma meter while the absorbance and transmittance properties were determined using spectrophotometer. Direct reflection property was calculated using Beer-Lambert equation. Quartic model was found to be the best for colour properties while quadratic model for absorbance and reflection properties. Quadratic model was not sufficient enough to describe the transmittance property. All models developed were found to be significant at $p < 0.05$ and were also confirmed. Optimal values for selecting sensors to identify, classify or sort cowpea seeds using the optical properties studied were developed.

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