

The Summer Undergraduate Research Fellowship (SURF) Symposium
3 August 2017
Purdue University, West Lafayette, Indiana, USA

Development of portable hyperspectral imaging device

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ABSTRACT

Most of the conventional hyperspectral imaging devices require sophisticated optical components, occupy a large footprint, and requires an initial capital investment for laboratories which mostly suits for laboratories benchtop system. The requirement of shipping the sample and waiting an extended period of time to get the results are the main downsides of this traditional approach. Capitalize in many specific field applications and diagnosis, portable devices provide both convenience and on-site results which are desirable for government agencies and food safety inspectors. This project was aimed to develop a low-cost, portable hyperspectral device for food safety applications. A smartphone was used in conjunction with a linear variable filter with continuously changing wavelength held by a stepper motor. An electronic system based on Bluetooth communication with the Android application was developed to control the movement of the stepper motor in order to capture the images under different wavelengths. With an in-house made image processing and analyzing application, the device would be used in real-time food quality and safety measurement, which has great prospects in the application of portable hyperspectral imaging device in food and other more areas.

KEYWORDS

Hyperspectral imaging, portable device, smartphone, food quality, food safety, linear variable filter