Different Filters on Multiple Lenses for Multispectral Imaging

A smartphone-attachable lens system enables faster, less costly, and easier-to-calibrate multispectral imaging for applications like crop analysis.

Multispectral cameras capture image data at specific frequencies across the electromagnetic spectrum. The images are much more detailed than a camera that captures only red, green, and blue (RGB). The most common multispectral cameras are expensive, slow, and difficult to calibrate. Modern smartphones use RGB cameras. A smartphone with the ability to capture multispectral images would be of great benefit for farmers to use to determine the health of their crops.

A Purdue University researcher has developed a lens system composed of multiple lenses and filters, allowing a camera to capture multiple image copies with only one camera shot. This lens system attaches to smartphones, making it possible for smartphones to capture multispectral imaging. The accompanying software calibrates the image copies from the multiple lenses. This lens system makes multispectral imaging less costly and easier to calibrate at a faster speed. This technology allows farmers to measure plant nutrition and stress and predict yield using their smartphone.

As part of this technology, the attachment part to the smartphone is designed to incorporate the multispectral function, the optimized location and direction of plant leaf (imaging target), and white referencing solution to illuminate environmental lighting variances.

Advantages:

-Multispectral image from one camera shot

-Less costly and easier to calibrate at a faster speed

-Adds multispectral imaging functionality to smartphones

-Allows farmers to measure plant nutrition and stress and predict yield using their smartphone

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Category

Agriculture, Nutrition, & AgTech/Precision Agriculture & Smart Farming

Robotics & Automation/Perception & Sensing

Authors

Jian Jin

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Potential Applications:

-Analysis of crops

-Any industry that uses multispectral cameras

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Intellectual Property:

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