HYPERSPECTRAL MICROSCOPY USING A PHASE MASK AND SPECTRAL FILTER ARRAY

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PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20240337824	10/10/2024	2023-120

BRIEF DESCRIPTION

Hyperspectral imaging, the practice of capturing detailed spectral (color) information from the output of an optical instrument such as a microscope or telescope, is useful in biological and astronomical research and in manufacturing. In addition to being bulky and expensive, existing hyperspectral imagers typically require scanning across a specimen, limiting temporal resolution and preventing dynamic objects from being effectively imaged. Snapshot methods which eliminate scanning are limited by a tradeoff between spatial and spectral resolution.

In order to address these problems, researchers at UC Berkeley have developed a hyperspectral imager which can be attached to the output of any benchtop microscope. The imager is compact (about 6-inches), and can achieve a higher spatial resolution than traditional snapshot imagers. Additionally, this imager needs only one exposure to collect measurements for an arbitrary number of spectral filters, giving it unprecedented spectral resolution.

SUGGESTED USES

Hyperspectral imaging, for example in biological and medical contexts, where high temporal, spatial, and spectral resolution are simultaneously desired.

ADVANTAGES

This imager, like traditional snapshot imagers, allows for dynamic systems to be studied by eliminating the need to scan across a specimen. In addition to being smaller and cheaper than existing devices, however, this imager can simultaneously achieve unprecedented spatial and spectral resolution.

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Compressive Plenoptic Imaging
- Partially Coherent Phase Recovery By Kalman Filtering
- System And Method For Noise-Enabled Static Imaging Using Event Cameras

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OTHER INFORMATION

KEYWORDS

Hyperspectral imaging, fluorescence imaging, microscopy

CATEGORIZED AS

» **Imaging**
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