COMPRESSIVE PLENOPTIC IMAGING

Tech ID: 25105 / UC Case 2015-188-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,317,667	06/11/2019	2015-188

BRIEF DESCRIPTION

Better understanding the brain's architecture and the behavior of neural networks requires non-invasive probes capable of monitoring brain activity at the scale of individual neurons. Functional neuro-imaging methods have the advantage of being minimally invasive and can potentially resolve individual action potentials. An ideal imaging method would be capable of quantifying many neurons simultaneously, have high spatial and temporal resolution, be non-invasive, and be accurate even in deep layers of brain tissue. There are a variety of current techniques available, many of which use mechanical scanning to reduce the effects of optical scattering and therefore have low temporal resolution.

UC Berkeley researchers have developed a device capable of quantitative functional neuro-imaging in the thick brain tissue of live animals. By combining a detection method with algorithmic data processing, this device achieves single neuron resolution and fast sampling rates with high spatial and temporal resolution.

SUGGESTED USES

- Optical monitoring of live tissues
- Monitoring live brains in real time
- Research tool in cognitive neurosciences and neuropsychology
- Brain-machine interfaces

ADVANTAGES

- High spatial and temporal resolution in 3D
- Simultaneous monitoring of multiple neurons
- Simple optical design with no fine alignment required
- Computationally efficient methods enable real time quantification of neural activity

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INVENTORS

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OTHER INFORMATION

KEYWORDS

light-field microscopy, fluorescence, brain, neuron, neural network, optical encoding phase mask

CATEGORIZED AS

- **Optics and Photonics**
  - All Optics and Photonics
- **Imaging**
  - Medical
- **Medical**
  - Imaging

RELATED CASES

2015-188-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Optical Phase Retrieval Systems Using Color-Multiplexed Illumination
- Partially Coherent Phase Recovery By Kalman Filtering
- Hyperspectral Microscopy Using A Phase Mask And Spectral Filter Array
- System And Method For Noise-Enabled Static Imaging Using Event Cameras

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