

Holographic Opto-Fluidic Microscopy

Tech ID: 27529 / UC Case 2011-045-0

SUMMARY

UCLA researchers in the Department of Electrical Engineering have developed a system for holographic opto-fluidic microscopy.

BACKGROUND

Opto-fluidics is an emerging field that aims to merge the available toolset of optics and microfluidics to create more flexible and reconfigurable optical devices with novel functionalities that can be incorporated into lab-on-a-chip platforms. Opto-Fluidic Microscopy (OFM) is another concept that came out of this emerging field, which aims to image objects flowing within a micro-fluidic channel without the use of any lenses.

In general, microfluidics enabled on-chip digital microscopy could especially be important for global health problems to assist diagnosis of disease in remote locations, and holds significant promise not only for point-of-care operation but also for telemedicine applications. The development of novel imaging modalities for microfluidics is required to achieve high spatial resolution and throughput.

INNOVATION

UCLA researchers led by Prof. Aydogan Ozcan have developed a new system for holographic opto-fluidic microscopy (HOM). This modality utilizes partially coherent inline holography and pixel super-resolution to create high-resolution amplitude and phase images of the objects flowing within micro-fluidic channels without the use of a lens.

APPLICATIONS

This technology could be useful in medical diagnostics and screening.

ADVANTAGES

- ▶ HOM does not involve complicated fabrication processes or precise alignment, nor does it require a highly uniform flow of objects within microfluidic channels
- ▶ Lens-less technology

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,767,341	09/09/2017	2011-045

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INVENTORS

- ▶ Ozcan, Aydogan

OTHER INFORMATION

KEYWORDS

Lab-on-chip, microfluidics, Opto-Fluidic Microscopy, Opto-fluidics, holographic opto-fluidic microscopy, microscopy, point-of-care, telemedicine, microscopy

CATEGORIZED AS

- ▶ **Optics and Photonics**
 - ▶ All Optics and Photonics
- ▶ **Biotechnology**
 - ▶ Health
- ▶ **Imaging**
 - ▶ Medical
 - ▶ Molecular
 - ▶ Other
- ▶ **Medical**
 - ▶ Devices
 - ▶ Diagnostics
 - ▶ Imaging
 - ▶ Other
 - ▶ Screening
- ▶ **Nanotechnology**
 - ▶ NanoBio
- ▶ **Sensors & Instrumentation**
 - ▶ Biosensors
 - ▶ Medical

RELATED CASES

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ Automated Semen Analysis Using Holographic Imaging
- ▶ Low-Cost And Portable Uv Holographic Microscope For High-Contrast Protein Crystal Imaging
- ▶ Extended Depth-Of-Field In Holographic Image Reconstruction Using Deep Learning-Based Auto-Focusing And Phase-Recovery
- ▶ Detection and Spatial Mapping of Mercury Contamination in Water Samples Using a Smart-Phone
- ▶ Computational Cytometer Based On Magnetically-Modulated Coherent Imaging And Deep Learning
- ▶ Lensfree Tomographic Imaging
- ▶ Single Molecule Imaging and Sizing of DNA on a Cell Phone
- ▶ Cross-Modality Deep Learning Brings Bright-Field Microscopy Contrast To Holography
- ▶ Microscopic Color Imaging And Calibration
- ▶ Quantification Of Plant Chlorophyll Content Using Google Glass
- ▶ Rapid, Portable And Cost-Effective Yeast Cell Viability And Concentration Analysis Using Lensfree On-Chip Microscopy And Machine Learning
- ▶ Design Of Task-Specific Optical Systems Using Broadband Diffractive Neural Networks
- ▶ Ultra-Large Field-of-View Fluorescent Imaging Using a Flatbed Scanner
- ▶ Revolutionizing Micro-Array Technologies: A Microscopy Method and System Incorporating Nanofeatures
- ▶ Tunable Vapor-Condensed Nano-Lenses

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