

Technology Development Group

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Lensfree Tomographic Imaging

Tech ID: 29202 / UC Case 2011-373-0

SUMMARY

Request Information

UCLA researchers in the Department of Electrical Engineering have developed a system for lens-free tomographic imaging.

BACKGROUND

Traditional light microscopy is a critical tool in medical imaging, diagnostics, and in research, however much of the technology remains fundamentally unchanged since their development (i.e. use of lenses and eyepiece/detector). In efforts to visualize increasingly smaller features and gain high resolution and contrast has resulted in significantly larger and more complex microscopes. With the advent of microfluidic (lab-on-a-chip) technology we have begun to be able to handle biological samples within miniaturized systems. However, we still rely on traditional light microscopes, which are several orders of magnitude larger, and have limited fields of view to image microfluidic devices. As a result there is a current clear need for miniaturized imaging platforms for microfluidic technologies.

INNOVATION

UCLA researchers led by Prof. Aydogan Ozcan have developed a new system for lens-free tomographic imaging. They have demonstrated for the first time in high resolution and large field of view a tomographic image utilizing a lens-free system on a microfluidic chip. This technology also allows for pixel super resolution techniques to be applied to optical tomographic imaging.

APPLICATIONS

This technology could be used to generate tomography images of organelles, cells, cellular components, or small particles in static or flow based environments.

ADVANTAGES

- Technology can be incorporated into microfluidics
- Much smaller form factor than traditional imaging techniques
- Lens-less technology

STATE OF DEVELOPMENT

This technology has been used to visualize several biological and synthetic samples.

PATENT STATUS

Country	Туре	Number	Dated	Case
United States Of America	Issued Patent	9,605,941	03/28/2017	2011-373

CONTACT

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INVENTORS

Ozcan, Aydogan

OTHER INFORMATION

KEYWORDS

lab-on-chip, microfluidics, microscopy,

tomographic imaging, lens-free

tomographic imaging, lab-on-chip

imaging, and super resolution optical imaging

CATEGORIZED AS

- Optics and Photonics
 - All Optics and Photonics
- Biotechnology
 - ► Health

Imaging

- Medical
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 - Imaging
 - Other
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- ▶ 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
- ▶ Single Molecule Imaging and Sizing of DNA on a Cell Phone
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- Design Of Task-Specific Optical Systems Using Broadband Diffractive Neural Networks
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