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# An Automatic Three-Dimensional Segmentation Method For OCT And Doppler OCT Angiography

Tech ID: 25857 / UC Case 2015-979-0

## BRIEF DESCRIPTION

Optical coherence tomography (OCT) is a non-invasive, high resolution biomedical imaging technology. UCI researchers have developed an OCT-based, three-dimensional (3D) imaging system for early diagnosis and monitoring of vascular disease in the retina.

## FULL DESCRIPTION

Most retinal diseases are closely related to blood flow within the eye. Imaging of the retinal blood vessels is an important tool for physicians to diagnose and monitor retinal diseases. Fundus fluorescein angiography (FFA) is the standard for vascular imaging in the eye, but is invasive and comes with the associated risk of complications and side effects. In addition, FFA can only provide two-dimensional images of the inner surface of the eye and is unable to image deeper capillary networks well. Three-dimensional images from state of the art OCT systems are computationally expensive, and require several minutes to complete.

UCI researchers have developed an OCT-based, 3D automatic segmentation method with Doppler variance to visualize the individual layers in the retinal microvasculature. The non-invasive method provides high-contrast, 3D images that provide physicians with more detailed information than traditional FFA images. It can also image deeper intra-retinal layers, and distinguish vessels which are shielded by upper vessels. A preprocessing algorithm is applied which utilizes a graphics processor to allow the physician to preview the scan data in real time. The method is not limited to imaging the retina, and can be applied in other tissues.

## STATE OF DEVELOPMENT

The invention has been tested in vivo to image the vascular network of macular retina in a healthy subject. The invention will be tested on retinal disease.

## ADVANTAGES

- Non-invasive technique causes fewer side effects.
- Capable of imaging deeper blood vessels, including those shielded by upper vessels
- High image accuracy and contrast with real-time preview of data
- System can be applied to other tissues, such as the iris or conjunctiva vessels

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,463,247	11/05/2019	2015-979

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## OTHER INFORMATION

## CATEGORIZED AS

- » **Imaging**
- » Medical
- » **Medical**
- » Imaging

## RELATED CASES

2015-979-0

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