

# The Office of Technology Management

UNIVERSITY OF TEXAS  ARLINGTON

Tech ID: UTA 11-28

## 2D and 3D Noninvasive imaging of the Retina Microvasculature

**INVENTOR: Baohong Yuan Ph.D.**

### TECHNOLOGY NEED

High blood pressure which is responsible for death of about 360,000 American adults has been found to correlate with structural abnormalities of the microvasculature of the target organs. A large number of retinal diseases such as hypertensive retinopathy, retina vein or artery occlusion, glaucoma and antherosclerous display abnormal microvascular structures and are associated with elevated blood pressure in the microvasculature of the retina. To understand/study this correlation, there is a need to noninvasively image blood pressure distribution in the microvasculature of Retina. Unfortunately, no technique is available to carry out this function. This is mainly due to the lack of appropriated pressure sensors that can easily be distributed into the microvasculature and are sensitive enough to subtle blood pressure variations.

### INVENTION DESCRIPTION/SOLUTION

UTA researchers have developed a novel non-invasive technique for 2-D and 3-D imaging of local blood pressure distribution in the microvasculature of the retina. The system includes an electron-multiplying charge-coupled device (EMCCD) camera that employs a Z-scan method multiplying the imaging speed by four times. This system aids in the imaging of the blood pressure distribution in the microvasculature of the retina and is invaluable for studying the microcirculation-related retinal diseases and their pathophysiology. In addition, this technique will provide valuable implications about the microcirculations of other organs that are relatively inaccessible such as the brain, the heart and the kidney.

### APPLICATIONS

- Eye care
- Blood pressure monitoring

### KEY BENEFITS

- Noninvasive technique
- Easy to operate
- Imaging speed improved by four times
- Ability to provide 2-D or 3-D blood pressure distribution
- High spatial resolution of Blood pressure
- Provides pressure resolution of less than 1mmHg
- Can be incorporated into other clinically used retinal imaging techniques
- Ability to monitor retina blood pressure change over time

### STAGE OF DEVELOPMENT

Prototyped and tested

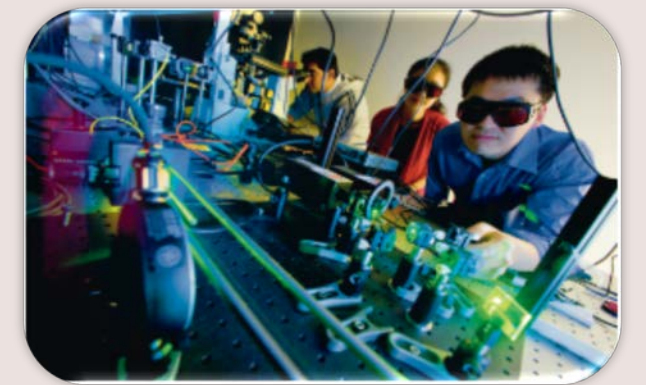
### INTELLECTUAL PROPERTY STATUS

Patents pending in

- Australia
- Brazil
- Canada
- China
- Egypt
- India
- Japan
- Mexico
- USA
- South Africa

### RELATED TECHNOLOGY

- UTA 11-13 [Biomedical Super-Resolution Imaging based on Ultrasound-Switchable Fluorescence](#)
- UTA 16-27 [Tissue thermometry via multi-color ultrasound-switchable fluorescence \(MC-USF\)](#)
- UTA 16-50 [Highly Specific Tissue Imaging](#)



**More about the Inventor:**  
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