

# Axial Motion Distortion Correction in Manually Scanned Hand-held Optical Coherence Tomography System

Published date: Oct. 14, 2016

## Technology description

Invention novelty:

The invention corrects involuntary axial motion during manual OCT scan, by post-processing images obtained from the OCT system.

Value Proposition:

Technical Details:

Johns Hopkins researchers have developed a method of correcting axial motion during manual OCT scan after the scan has been acquired. Optical Doppler tomography (ODT) has been used in non-invasive blood flow measurement. In ODT, the phase difference of complex OCT signal between pixels in adjacent A-scans is used to quantify the speed of moving scatterers in axial direction. Alternatively, one can use Doppler frequency to estimate the axial motion of a hand-held probe, assuming that the sample itself does not move. A global phase shift can be obtained from the shifts of all pixels, and used to calculate the axial speed and motion in between samples. This information can be used to correct for axial distortion from a manual scan.

Publication(s)/Associated Cases: Not available at this time

Categories: Medical Imaging

Keywords: OCT, distortion correction, hand-held, manual scanning

## Advantages

The Optical coherence tomography (OCT) is a high resolution optical imaging modality with many medical applications. In conventional OCT systems, a mechanical scanner scans the beam according to a pre-defined scanning pattern to form two dimensional (2D) or three dimensional (3D) images. On the other hand, OCT scans can also be performed manually with a hand-held probe that does not use a mechanical device to scan the beam. This type of hand-held probes could be made very compact and light-weight. Amplitude scans (A-scans) show how strongly the OCT signal is reflected by tissue along a dimension of interest. However, during freehand scanning, the axial distance between probe and sample surface varies due to the axial motion of human hands, causing image distortion. A method that corrects axial motion distortion has been developed using inter-Scan global Doppler phase shift, with the following advantages:

- Axial correction may be applied after the scan has been captured
- Does not require any additional hardware
- Negates the effects of hand tremor

## Institution

[Johns Hopkins University](#)

## Inventors

[Jin Kang](#)

Professor and Department Chair  
Electrical & Computer Eng. WSE

[Xuan Liu](#)

PhD Student  
Electrical & Computer Eng. WSE

## 联系我们



叶先生

电话 : 021-65679356

手机 : 13414935137

邮箱 : yeyingsheng@zf-ym.com