



# A Deep Learning Framework for Fusion of Power Doppler and Photoacoustic Imaging: Addressing the Limited-View Problem

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Venue: ZOOM Online

### Abstract

Photoacoustic tomography is a promising hybrid modality that combines optical and ultrasound technologies to deliver high-resolution images of biological tissues. Despite its significant potential, photoacoustic tomography suffers from the inherent issue of limited-view detection, which compromises image reconstruction accuracy, particularly for linear arrays. Various approaches have been proposed to address this limitation, yet challenges remain. Ultrasound-based imaging, particularly Power Doppler, has emerged as a helpful complement to photoacoustic tomography due to its high sensitivity to blood flow and structural resolution. In this study, we introduce a novel deep learning framework, DEPANet, that fuses Power Doppler structural information with photoacoustic spectral intensity to enhance image quality and improve the accuracy of vascular assessment. Our method successfully compensates for the limited-view problem by integrating deep learning techniques. We validated the model through simulation, phantom experiments, and in vivo studies, demonstrating significant improvements in contrast-to-noise ratio and oxygen saturation accuracy. The proposed method holds promise for enhancing photoacoustic imaging in clinical applications, offering a robust solution for detailed vascular imaging.

### Biography

Zheng Qu is now pursuing a Ph.D. degree in Prof. Lidai Wang's group with the Department of Biomedical Engineering, City University of Hong Kong. His research interests include photoacoustic imaging and artificial Intelligence algorithms.

***ALL are Welcome!***