

CNDE Webinar Presentation August 15, 2024 - 10:00 a.m. CST

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Nondestructive Imaging of Biological Tissues with Photoacoustic Imaging

Presented by: Manojit Pramanik
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Abstract:

Photoacoustic imaging is an emerging novel hybrid imaging technique combining both optical and ultrasound imaging. A short-pulsed laser illuminates the tissue to generate sound waves called the photoacoustic wave. These sound waves are used to get high contrast, high resolution deep tissue imaging of various parameters. Photoacoustic imaging like ultrasound imaging, is a multi-scale and multi-depth imaging modality. In this presentation, basics of photoacoustic imaging and several types of photoacoustic imaging systems will be covered. One particular clinical application of photoacoustic imaging is non-invasive sentinel lymph node detection for the breast cancer staging. Several other clinical applications of photoacoustic imaging will be discussed. Recent development of deep learning application in photoacoustic imaging also will be discussed.

1. D. Das, P. Rajendran, A. Sharma, and M. Pramanik, "Another decade of photoacoustic imaging," *Physics in Medicine & Biology* 66(5), 05TR01 (2021)..

Speaker:

Dr. Pramanik received his Ph.D. degree in Biomedical Engineering from Washington University in St. Louis, Missouri. Currently, he is an Associate Professor at the Department of Electrical and Computer Engineering at Iowa State University. He also has an appointment as a Faculty of Biomedical Engineering. His industry experiences include two years at GE Global Research, and one year at Philips in India. He has more than 120 international journal papers and ~150 conference publications and presentations. He serves as an Associate Editor of the *Journal of Biomedical Optics*, *Biomedical Optics Express*, and as an Editorial Board Member of *Photoacoustics*. He is a Senior Member of SPIE, IEEE. Dr. Pramanik is also the inaugural "Biodesign Faculty Fellow" offered by the Singapore Biodesign Programme (in collaboration with Stanford Biodesign Fellowship).

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