Photons Plus Ultrasound: Imaging and Sensing 2022

Alexander A. Oraevsky Lihong V. Wang Editors

22–27 January 2022 San Francisco, California, United States

20–24 February 2022 ONLINE

Sponsored by SENO Medical Instruments, Inc. (United States)

Published by SPIE

Volume 11960

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings: Author(s), "Title of Paper," in *Photons Plus Ultrasound: Imaging and Sensing 2022*, edited by Alexander A. Oraevsky, Lihong V. Wang, Proc. of SPIE 11960, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 1605-7422

ISSN: 2410-9045 (electronic)

ISBN: 9781510647916

ISBN: 9781510647923 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2022 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.



Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

v Conference Committee

	IN VIVO HUMAN IMAGING
11960 02	Quantitative assessment of peripheral vasculature using a 3D bimodal photoacoustic and ultrasound foot scanner [11960-3]
11960 03	Learning-based enhancement of limited-view optoacoustic tomography based on image- and time-domain data [11960-5]
	SMALL-ANIMAL IMAGING I
11960 04	Multispectral high-resolution imaging of porcine gastric layer [11960-14]
11960 05	Whole-body imaging of mice in under two sec with single-sweep volumetric optoacoustic tomography (sSVOT) [11960-16]
	POSTER SESSION
11960 06	Integration of photoacoustic computed tomography with multitargeted polymer-based nanoparticles visualizes breast cancer intratumor heterogeneity [11960-67]
11960 07	Photoacoustic tomography to assess acute vasoactivity of systemic vasculature [11960-25]
11960 08	Multi-transducer photoacoustic tomography imaging without radius calibration using deep learning [11960-107]
11960 09	Miniaturized transparent ultrasound sensor for photoacoustic endoscopy [11960-109]
11960 OA	Optimization of a dual wavelength atlas technique to differentiate methylene blue from hemoglobin in photoacoustic signals [11960-110]
11960 OB	Comparative study of feature generation algorithms for mosaic photoacoustic microscopy [11960-113]
11960 OC	Spatial resolution improvement of acoustic resolution photoacoustic microscopy using cycle-consistent GAN [11960-114]
11960 OD	High-resolution photoacoustic microscopy based on a transparent ultrasonic transducer [11960-116]

11960 OE	Volumetric photoacoustic/ultrasound imaging using 2D matrix array transducer scanner [11960-124]
	SPECIAL SESSION: BEST PAPER AWARD COMPETITION I
11960 OF	Panoramic photoacoustic and ultrasound imaging [11960-27]
11960 OG	Picosecond ultrasonics for cell imaging and characterization of biological cells [11960-33]
	SPECIAL SESSION: BEST PAPER AWARD COMPETITION II
11960 OH	High-resolution, high-speed photoacoustic microscopy and photoplethysmography for clinical applications in human fingers [11960-39]
	SPECIAL SESSION: BEST PAPER AWARD COMPETITION III
11960 OI	Second generation photoacoustic remote sensing virtual histology [11960-40]
11960 OJ	Multiscale photoacoustic tomography of a genetically encoded near-infrared FRET biosensor [11960-41]
11960 OK	A combined ultrasound and photoacoustic imaging platform for clinical research applications [11960-46]
	NOVEL SYSTEMS INCLUDING WAVEFRONT SHAPING
11960 OL	Al-enabled high-speed photoacoustic endomicroscopy through a multimode fibre [11960-53]
11960 OM	Transcranial imaging with the optoacoustic memory effect [11960-54]
11960 ON	Super-resolution photoacoustic microscopy beyond diffraction limit: preliminary results [11960-55]
11960 00	Compact optical link acquisition for high-speed optoacoustic imaging [11960-58]
11960 OP	Improvement of LED-based photoacoustic imaging using sign coherence factor based on lag-delay-multiply-and-sum beamformer [11960-136]
11960 OQ	Three-dimensional handheld LED-based photoacoustic/ultrasound imaging: a potential point-of-care tool for diagnosing peripheral arterial disease [11960-139]

11960 OR	Guidance of lymphaticovenous anastomosis using LED-based photoacoustic lymphangiography: a human volunteer study [11960-140]
11960 OS	Noise considerations in piezoelectric transparent ultrasound transducers for photoacoustic imaging applications [11960-142]
11960 OT	An optimized geometry for simultaneous functional ultrasound and photoacoustic imaging [11960-144]
11960 OU	2D-FC-ADMM reconstruction algorithm for quantitative optoacoustic tomography in a highly scattering medium: simulation study [11960-157]
11960 OV	High-resolution speed of sound estimation from ultrasound waves extended full wave inversion [11960-158]
11960 OW	Compressed sensing image reconstruction algorithm for linear array transducer based on alternating directions of directional multipliers [11960-159]
11960 OX	Transfontanelle thermoacoustic imaging characterization: simulation study [11960-161]
11960 OY	Challenges of transcranial photoacoustic imaging for human at 2.25 MHz: an ex vivo study [11960-162]
11960 OZ	Cerebral blood oxygenation measurement in sheep brain in-vivo using transfontanelle photoacoustic spectroscopy [11960-163]
11960 10	Deep learning boosted photoacoustic microscopy with an extremely low energy laser [11960-164]
11960 11	A fast ultra-wide laser scanning photoacoustic microscopy: system characterization and phantom study [11960-168]
11960 12	Design and optimization of simulated light delivery systems for photoacoustic assessment of peripheral nerve injury [11960-169]
11960 13	A PMUT-based photoacoustic system as a microfluidic concentration detector [11960-170]
	ADVANCES IN PHANTOMS AND PHANTOM STUDIES
11960 14	Quantitative photoacoustic imaging of simulated carotid plaques in a neck phantom [11960-63]
	CONTRAST AGENTS, MOLECULAR AND QUANTITATIVE IMAGING
11960 15	Generation and applications of broadband high-frequency laser ultrasound with nanostructured materials [11960-72]
11960 16	Optoacoustic visualization of individual core-shell microparticles in vivo [11960-73]

OPTICAL SENSING OF PRESSURE/DISPLACEMENT 11960 17 Photoacoustic raster scan imaging using an optomechanical ultrasound sensor in silicon **photonics** [11960-85] 11960 18 A photoacoustic microscopy system using MEMS and fibre tip transducers for all-optical **control** [11960-87] **ADVANCES IN ULTRASOUND DETECTION** 11960 19 Dual-modal photoacoustic and ultrasound microscopy using optically-transparent and high-NA PVDF transducer [11960-88] A novel translucent ultrasound transducer approach for dual-modality ultrasound and 11960 1A photoacosutic imaging [11960-89] 11960 1B An optically-transparent PVDF transducer array for photoacoustic tomography [11960-90] ADVANCES IN ENDOSCOPY AND MICROSCOPY 11960 1C Feasibility of laparoscopic photoacoustic imaging system based on diffusing side-illumination fibers [11960-94]