Opto-Acoustic Methods and Applications in Biophotonics IV

Vasilis Ntziachristos Roger Zemp Editors

24–25 June 2019 Munich, Germany

Sponsored by The Optical Society (United States) SPIE

Published by SPIE

Volume 11077

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 Opto-Acoustic Methods and Applications in Biophotonics IV, edited by Vasilis Ntziachristos, Roger Zemp, Proceedings of SPIE-OSA Vol. 11077 (SPIE, Bellingham, WA, 2019) Seven-digit Article CID Number.

ISSN: 1605-7422

ISSN: 2410-9045 (electronic)

ISBN: 9781510628472

ISBN: 9781510628489 (electronic)

Copublished by

SPII

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time)· Fax +1 360 647 1445 SPIE.org

and

The Optical Society

2010 Massachusetts Ave., N.W., Washington, D.C., 20036 USA Telephone 1 202/223-8130 (Eastern Time) Fax 1 202/223-1096 http://www.osa.org

Copyright © 2019, Society of Photo-Optical Instrumentation Engineers and The Optical Society.

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 copying fees. The Transactional Reporting Service base fee for this volume is \$21.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online 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. The CCC fee code is 1605-7422/19/\$21.00.

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: Proceedings of SPIE follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article 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

vii ix	Authors Conference Committee
	CLINICAL APPLICATIONS II
11077 05	Optoacoustic guidance for stem cell therapy [11077-4]
11077 07	High-frequency photoacoustic and ultrasound imaging of systemic sclerosis patients [11077-6]
11077 08	Tumor ablation and volumetric optoacoustic monitoring with a short-pulsed laser source [11077-7]
11077 09	In-situ temperature monitoring with photoacoustics during photothermal therapy and perspectives for glioblastoma treatment monitoring [11077-8]
	ALGORITHMS AND QUANTITATIVE IMAGING
11077 OB	Analysis of different approaches for blood oxygenation determination from multispectral optoacoustic measurements [11077-10]
11077 0D	Photoacoustic computed tomography for joint reconstruction of initial pressure and sound speed in vivo using a feature coupling method [11077-12]
11077 OE	Use of angular distribution of differential photoacoustic cross-section data for estimating source size [11077-13]
	NOVEL DETECTORS AND SYSTEMS I
11077 OH	Probing the optical readout characteristics of Fabry-Pérot ultrasound sensors through realistic modelling [11077-16]
11077 OI	Optical phase shifted pulse interferometry for parallel multi-channel ultrasound detection [11077-17]
11077 OK	Multimodal imaging through a multimode fiber [11077-19]

NOVEL DETECTORS AND SYSTEMS II

11077 OL	Annular illumination photoacoustic probe for needle guidance in medical interventions [11077-20]
11077 ON	Developments on using supercontinuum sources for high resolution multi-imaging instruments for biomedical applications [11077-22]
11077 OP	Out-of-plane artifact removal in photoacoustic imaging using transducer array displacement [11077-24]
11077 0Q	Photoacoustic tomography setup using LED illumination [11077-25]
	MICROSCOPY
11077 0X	Generation and monitoring of cavitation with an optical resolution photoacoustic microscope [11077-33]
11077 0Y	Dual-wavelength nanosecond pulsed-laser using stimulated Raman scattering for fast functional photoacoustic microscopy [11077-34]
	POSTER SESSION
11077 11	Optoacoustic angiography of experimental tumors [11077-26]
11077 13	A robust modified delay-and-sum algorithm for photoacoustic tomography imaging with apodized sensors [11077-38]
11077 14	Pulse interferometry with a free-space Fabry-Pérot for shot-noise-limited detection of ultrasound [11077-39]
11077 15	Photoacoustic assisted device guidance and thermal lesion imaging for radiofrequency ablation [11077-40]
11077 16	Laser-induced ultrasound transmitters for 3D photoacoustic and ultrasound tomography [11077-41]
11077 1B	Fundamental study for identification and elimination of reflection artifacts with photoacoustic spectrum [11077-47]
11077 1C	Combined photoacoustic and fluorescence label-free microscopy for the ex-vivo investigation of ocular tissues [11077-48]
11077 1E	Acoustic resolution photoacoustic microscopy with large area optical ultrasound detection [11077-50]
11077 1G	Large area all-optical ultrasound imaging using robotic control [11077-52]

Non-invasive in-vivo sensing of metabolites with a novel optoacoustic spectroscope in the SWIR [11077-53]
Model for the description of remote photoacoustic sensing using speckle-analysis [11077-54]
Evaluation of arthritis with model rats using photoacoustic imaging system [11077-55]
Multiphysics simulation approach for photo-acoustics temperature monitoring in rodent's head during photothermal therapy [11077-56]
Acoustic differentiation of dental soft and hard tissues using remote speckle-analysis during Er:YAG ablation [11077-57]
Intraplaque haemorrhage detection using single-wavelength PAI and singular value decomposition in the carotid artery [11077-58]
Probing intervertebral discs with photoacoustics [11077-61]
Remote speckle-sensing for improved differentiation between different types of tissues [11077-62]
Camera-based photoacoustic remote sensing microscopy [11077-63]