

PROGRESS IN BIOMEDICAL OPTICS AND IMAGING

Vol. 24 No. 16

Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XXVII

Joseph A. Izatt
James G. Fujimoto
Editors

30 January – 1 February 2023
San Francisco, California, United States

Sponsored and Published by
SPIE

Volume 12367

Proceedings of SPIE, 1605-7422, V. 12367

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XXVII,
edited by Joseph A. Izatt, James G. Fujimoto, Proc. of SPIE Vol. 12367,
1236701 · © 2023 SPIE · 1605-7422 · doi: 10.1117/12.2676907

Proc. of SPIE Vol. 12367 1236701-1

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 SPIDigitalLibrary.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 *Optical Coherence Tomography and Coherence Domain Optical Methods in Biomedicine XXVII*, edited by Joseph A. Izatt, James G. Fujimoto, Proc. of SPIE 12367, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 1605-7422

ISSN: 2410-9045 (electronic)

ISBN: 9781510658394

ISBN: 9781510658400 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2023 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.

SPIE. DIGITAL LIBRARY

SPIDigitalLibrary.org

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

vii *Conference Committee*

OCT ENDOSCOPY

- 12367 02 **Development of a hand-held OCT laryngoscope for reconstruction of 4-D vocal fold dynamics**
[12367-3]
- 12367 03 **Synchronous high-speed OCT imaging with sensorless brushless DC motor and FDML laser in a phase-locked loop** [12367-6]

NEW LIGHT SOURCES

- 12367 04 **Novel 1.6 MHz swept source for real-time volumetric in-vivo OCT imaging of the human retina**
[12367-8]
- 12367 05 **850 nm FDML: performance and challenges** [12367-9]
- 12367 06 **MHz time stretch swept source using a commercial erbium-doped fiber amplifier** [12367-10]
- 12367 07 **1190 nm Fourier domain mode locked (FDML) laser for optical coherence tomography (OCT)**
[12367-11]
- 12367 08 **A dual resonance sweeping regime in dispersion tuned akinetic swept source at 1550 nm**
[12367-12]

OPHTHALMIC NEW TECHNOLOGY

- 12367 09 **Optimization of intraoperative spectrally encoded coherence tomography and reflectometry for ophthalmic surgery** [12367-18]

BLOOD FLOW

- 12367 0A **Sub-diffusion flow velocimetry with number fluctuation optical coherence tomography**
[12367-24]
- 12367 0B **Scanning dynamic light scattering optical coherence tomography for measurement of high omnidirectional flow velocities** [12367-26]

NOVEL IMAGE SCANNING APPROACHES

- 12367 0C **Large area robotically assisted optical coherence tomography (LARA-OCT) for skin imaging with MHz-OCT surface tracking [12367-29]**
- 12367 0D **High-speed automatically aligning tabletop optical beam scanning device for OCT [12367-33]**
- 12367 0E **Multiple scattering suppression by multi-focus averaging in Jones-matrix optical coherence tomography [12367-34]**

NOVEL SAMPLE ARM DESIGN

- 12367 0F **Real-time line-field OCT using low-cost high-speed camera [12367-38]**
- 12367 0G **DMD-based structured illumination full-field optical coherence tomography [12367-40]**

OCT NEW TECHNOLOGY

- 12367 0H **Visualization of backscattering photon distribution with beam-offset OCT [12367-46]**
- 12367 0I **Rotational distortion and compensation in optical coherence tomography [12367-47]**
- 12367 0J **Fast iterative method empowered by GPU acceleration for Fourier-domain optical coherence tomography image reconstruction [12367-48]**

NOVEL CONTRAST

- 12367 0K **Visible-light optical coherence microscopy for corneal imaging [12367-49]**
- 12367 0L **Classifying tumor heterogeneity of human esophageal cancer biopsies by dynamic contrast OCT with deep learning [12367-52]**
- 12367 0M **Attenuation coefficient measurements with OCT Monte Carlo simulations compared with experimental OCT measurements on intralipid [12367-55]**
- 12367 0N **Early identification of low-grade acute radiation dermatitis using in vivo optical coherence tomography (OCT) images of human head and neck [12367-56]**

PSOCT

- 12367 0O **Epidermal-dermal segmentation and polarization feature analysis using advanced Jones matrix optical coherence tomography** [12367-60]

OPTICAL COHERENCE ELASTOGRAPHY

- 12367 0P **High-resolution 3D biomechanical mapping of embryos with reverberant optical coherence elastography (Rev-OCE)** [12367-63]
- 12367 0Q **Phase analysis strategies for MHz OCE in the large displacement regime** [12367-66]

MACHINE LEARNING AND IMAGE PROCESSING

- 12367 0R **Morphological segmentation and fractal analysis for the classification of colon polyps from en face optical coherence tomography (OCT) images** [12367-69]
- 12367 0S **Stable classification of diabetic structures from incorrectly labeled optical coherence tomography angiography en face images using multi instance learning** [12367-70]
- 12367 0T **Real-time neural-network-based denoising for intraoperative 4D-OCT** [12367-71]
- 12367 0U **Complex conjugate artifact removal in FD-OCT using generative adversarial network** [12367-74]

IN VITRO AND SMALL ANIMAL

- 12367 0V **Revealing the in vivo process of newt lens regeneration with OCT and OCTA** [12367-80]
- 12367 0W **Graphene-enabled optical cardiac control in *Drosophila melanogaster*** [12367-81]
- 12367 0X **Characterization of age-related follicle changes in mice ovaries using optical coherence tomography** [12367-83]

DIGITAL POSTERS

- 12367 0Y **Learning OCT segmentation from a single label** [12367-89]

POSTER SESSION

- 12367 0Z **Common-path optical coherence tomography using Bessel beam axicon probe for malignancy identification** [12367-84]
- 12367 10 **Design and fabrication of a long-term stable model eye for OCT retinal imaging** [12367-86]
- 12367 11 **Integrated 840nm high-power dual-polarization SLED source** [12367-87]
- 12367 12 **Evaluating vessel mechanics with optical coherence tomography based digital image correlation** [12367-94]
- 12367 13 **B-scan-wise multi-focus averaging method to suppress multiple scattering signal** [12367-100]
- 12367 14 **OCTSharp: an open-source C# software for OCT** [12367-101]
- 12367 15 **Uncertainty measurement and confidence calibration for calcium detection in optical coherence images** [12367-103]
- 12367 16 **Characterization of SiN/SiO₂-based MEMS-VCSEL at 1550 nm for optical coherence tomography** [12367-106]
- 12367 17 **3D motion tracking using optical coherence tomography based on circular scan patterns** [12367-107]

Conference Committee

Symposium Chairs

Sergio Fantini, Tufts University (United States)
Paola Taroni, Politecnico di Milano (Italy)

Symposium Co-chairs

Jennifer K. Barton, The University of Arizona (United States)
Wolfgang Drexler, Medizinische Universität Wien (Austria)

Program Track Chairs

Tuan Vo-Dinh, Duke University (United States)
Anita Mahadevan-Jansen, Vanderbilt University (United States)

Conference Chairs

Joseph A. Izatt, Duke University (United States)
James G. Fujimoto, Massachusetts Institute of Technology
(United States)

Conference Program Committee

Peter E. Andersen, Technical University of Denmark (Denmark)
Kostadinka Bizheva, University of Waterloo (Canada)
Stephen A. Boppart, University of Illinois at Urbana-Champaign
(United States)
Zhongping Chen, Beckman Laser Institute and Medical Clinic
(United States)
Johannes de Boer, Vrije Universiteit Amsterdam (Netherlands)
Wolfgang Drexler, Medizinische Universität Wien (Austria)
Grigory V. Gelikonov, Institute of Applied Physics (Russian Federation)
Christoph K. Hitzenberger, Medizinische Universität Wien (Austria)
Robert A. Huber, Universität zu Lübeck (Germany)
Rainer A. Leitgeb, Medizinische Universität Wien (Austria)
Xingde Li, Johns Hopkins University (United States)
Yingtian Pan, Stony Brook University (United States)
Adrian G. H. Podoleanu, University of Kent (United Kingdom)
Andrew M. Rollins, Case Western Reserve University (United States)
Marinko V. Sarunic, Simon Fraser University (Canada)

Guillermo J. Tearney, Wellman Center for Photomedicine
(United States)
Valery V. Tuchin, Saratov State University (Russian Federation) and
Tomsk State University (Russian Federation) and Institute of Precision
Mechanics and Control of the RAS (Russian Federation)
Ruikang K. Wang, University of Washington (United States)
Maciej Wojtkowski, Nicolaus Copernicus University (Poland)
Yoshiaki Yasuno, University of Tsukuba (Japan)