

PROGRESS IN BIOMEDICAL OPTICS AND IMAGING

Vol. 24 No. 39

# ***High-Speed Biomedical Imaging and Spectroscopy VIII***

**Kevin K. Tsia**  
**Keisuke Goda**  
*Editors*

**28–30 January 2023**  
**San Francisco, California, United States**

*Sponsored by*  
SPIE

*Cosponsored by*  
Hitachi High-Technologies (Japan)

*Published by*  
SPIE

**Volume 12390**

Proceedings of SPIE, 1605-7422, V. 12390

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

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](http://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 *High-Speed Biomedical Imaging and Spectroscopy VIII*, edited by Kevin K. Tsia, Keisuke Goda, Proc. of SPIE 12390, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 1 605-7422

ISSN: 2410-9045 (electronic)

ISBN: 9781510658851

ISBN: 9781510658868 (electronic)

Published by

**SPIE**

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

Telephone +1 360 676 3290 (Pacific Time)

[SPIE.org](http://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](http://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](http://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

v *Conference Committee*

---

## HIGH-SPEED FLUORESCENCE IMAGING

---

12390 02 **Speckle flow structured illumination microscopy for dynamic super-resolution imaging**  
[12390-3]

---

## AI IMAGE CONSTRUCTION AND ANALYTICS

---

12390 03 **On-the-fly Raman microscopy guaranteeing the accuracy of diagnosis by reinforcement learning (Invited Paper)** [12390-5]

12390 04 **Image restoration of FACED microscopy by generative adversarial network** [12390-7]

12390 05 **Large-scale, batch-effect-free augmented quantitative phase imaging by generative learning**  
[12390-10]

---

## HIGH-SPEED MULTIPHOTON IMAGING

---

12390 06 **Design and characterization of two-photon line excitation array detection (2p-LEAD) microscopy for monitoring in vivo neuronal activity** [12390-13]

12390 07 **Kilohertz two-photon SLIDE microscopy using a newly developed 780 nm excitation laser**  
[12390-14]

---

## NOVEL HIGH-SPEED IMAGING TECHNOLOGY

---

12390 08 **Ultrafast phase imaging of propagating current flows in myelinated axons and electromagnetic pulses in dielectrics** [12390-23]

---

## HIGH-SPEED VIBRATIONAL IMAGING

---

12390 09 **Video-rate wide-field broadband coherent anti-Stokes Raman scattering microscopy**  
[12390-26]

---

**IMAGE CYTOMETRY**

---

- 12390 0A **Deciphering the efficacy of antiplatelet drugs under vascular stenosis by high-speed on-chip optofluidic imaging** [12390-33]
- 12390 0B **Imaging flow cytometry for modern particle analysis** [12390-36]

---

**HIGH-SPEED FLUORESCENCE LIFETIME IMAGING**

---

- 12390 0C **Single-shot photoluminescence lifetime imaging for fast wide-field optical thermometry** [12390-38]

---

**HIGH-SPEED OPTICAL COHERENCE TOMOGRAPHY**

---

- 12390 0D **High speed 4D in-vivo OCT imaging of the human brain: creating high density datasets for machine learning toward identification of malign tissue in real time** [12390-41]
- 12390 0E **Toward sub-5  $\mu\text{m}$  axial resolution OCT from a multiple-MHz swept source** [12390-42]

---

**POSTER SESSION**

---

- 12390 0F **High-speed photoacoustic monitoring of vascular changes during acute hyperglycemia** [12390-47]
- 12390 0G **High-speed fluorescence molecular tomography reconstructions through a sparsity constrained neural network** [12390-49]
- 12390 0H **An end-to-end adaptive neural network for process-aware snapshot compressive temporal imaging** [12390-50]
- 12390 0J **FPGA-based CNN accelerator for high-speed biomedical application** [12390-56]