Front Matter: Volume 9720
High-Speed Biomedical Imaging and Spectroscopy: Toward Big Data Instrumentation and Management

Kevin K. Tsia
Keisuke Goda
Editors

13–14 February 2016
San Francisco, California, United States

Sponsored by
Hamamatsu Corporation (United States)
PiPhotonics, Inc. (Japan)
Hitachi High-Technology Corporation (Japan)

Published by
SPIE

Volume 9720

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

v Authors
vii Conference Committee

SESSION 1  ULTRAFAST IMAGING

9720 03 Multi-aperture ultra-high-speed imaging with lateral electric field charge modulators (Invited Paper) [9720-2]
9720 04 Pixel super-resolution of time-stretch imaging by an equivalent-time sampling concept (PiPhotonics Best Paper Award) [9720-3]
9720 06 Scan-less, line-field confocal microscopy by combination of wavelength/space conversion with dual optical comb [9720-5]

SESSION 2  COMPUTATIONAL IMAGING

9720 07 Parallel phase-shifting digital holography and its application to high-speed 3D imaging of dynamic object (Invited Paper) [9720-6]
9720 08 Improving image quality in compressed ultrafast photography with a space- and intensity-constrained reconstruction algorithm [9720-7]
9720 09 Three-wavelength digital holography using spatial frequency-division multiplexing and dual reference arms [9720-8]
9720 0A 4D phase-space multiplexing for fluorescence microscopy [9720-9]

SESSION 3  BIG DATA INSTRUMENTATION AND MANAGEMENT

9720 0C Gigapixel imaging with microlens arrays (Hitachi High-Tech Best Paper Award) [9720-11]
9720 0D All-IP-Ethernet architecture for real-time sensor-fusion processing [9720-12]
9720 0E A computational approach to real-time image processing for serial time-encoded amplified microscopy [9720-13]

SESSION 4  HIGH-SPEED NONLINEAR IMAGING

9720 0J A CMOS image sensor using high speed lock-in pixels for stimulated Raman scattering [9720-18]
SESSION 5  4D IMAGING

9720 0O  GPU-based computational adaptive optics for volumetric optical coherence microscopy (Hamamatsu Best Paper Award) [9720-22]

9720 0P  Selective-plane illumination microscopy for high-content volumetric biological imaging [9720-23]

SESSION 6  LIGHT-SHEET MICROSCOPY

9720 0R  Whole-animal imaging with high spatio-temporal resolution (Invited Paper) [9720-25]

SESSION 7  INSTRUMENTATION FOR HIGH-SPEED IMAGING AND SPECTROSCOPY

9720 0T  Enhanced speed in fluorescence imaging using beat frequency multiplexing (Invited Paper) [9720-27]

9720 0U  A light sheet confocal microscope for image cytometry with a variable linear slit detector [9720-28]

SESSION 8  IMAGING FLOW CYTOMETRY

9720 0X  High-throughput time-stretch microscopy with morphological and chemical specificity (Hamamatsu Best Paper Award) [9720-31]

9720 10  Imaging flow cytometer using computation and spatially coded filter (Hitachi High-Tech Best Paper Award) [9720-34]

9720 11  Ultrafast quantitative time-stretch imaging flow cytometry of phytoplankton (PiPhotonics Best Paper Award) [9720-35]

POSTER SESSION

9720 14  A study on the characteristics of the Analog Mean-Delay (AMD) method for high-speed Fluorescence Lifetime Imaging Microscopy (FLIM) [9720-38]

9720 18  Entropy analysis of OCT signal for automatic tissue characterization [9720-42]

9720 1C  One shot confocal microscopy based on wavelength/space conversion by use of multichannel spectrometer [9720-47]

9720 1D  Wide-band and fast wavelength-swept optical parametric oscillator based on dispersion tuning technology in photonic crystal fiber at 1 μm [9720-48]
Authors

Numbers in the index correspond to the last two digits of the six-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first four digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Adie, Steven G., 0O
Amat, Fernando, 0R
Arai, Yasuhiko, 09
Awatsuji, Yasuhiro, 07
Bellfield, Kevin D., 18
Benson, Devin, 0U
Chan, Antony C. S., 04
Chen, Hongwei, 1D
Chen, Jin, 1D
Chen, Minghua, 1D
Chen, Yujia, 08
Chhetri, Raghav K., 0R
Di Carlo, Dino, 0X
Endo, Yutaka, 0E
Fritsch, Ingrid, 0U
Gao, Liang, 08
Goda, Keisuke, 0E, 0T, 0X
Guo, Qiang, 1D
Hamad, Syed, 0T
Han, Yuanyuan, 10
Hase, Eiji, 06, 1C
Hasegawa, Satoki, 0E
Hashimoto, Mamoru, 0J
Hiraki, Kei, 0D
Hirayama, Ryuki, 0E
Hiyama, Daisuke, 0E
Höckendorf, Burkhard, 0R
Hsieh, Yi-Da, 06
Huang, Bo, 0P
Hubbi, Basil, 18
Hunter, Courtney, 0U
Hutcheson, Joshua A., 0U
Ichikawa, Ryuji, 1C
Ideguchi, Takuro, 0X
Inaba, Mary, 0D
Kagawa, Keiichiro, 03, 0J
Kaku, Toru, 09
Kawahito, Shoji, 03, 0J
Keller, Philipp J., 0R
Khan, Foysal Z., 0U
Kim, Byungyeon, 14
Kobayashi, Hirofumi, 0T
Koizumi, Kenichi, 0D
Kondo, Shuya, 0D
Kuroshima, Mai, 0E
Lai, Queenie T. K., 11
Lam, Edmund Y., 04
Lau, Andy K. S., 11
Lee, Seungroag, 14
Lei, Cheng, 0E, 0X
Lemon, William C., 0R
Liang, Jinyang, 08
Looe, DeXing, 0J
Liu, Hsiou-Yuan, 0A
Lo, Yu-Hwa, 10
Ma, Cheng, 08
Maki, Masanori, 0E
Mars, Karel, 0J
Matoba, Osamu, 07
McGorty, Ryan, 0P
Mikami, Hideharu, 0T
Minamikawa, Takeo, 06, 1C
Miyamoto, Shoji, 06, 1C
Mochizuki, F., 03
Morimoto, Kenta, 09
Muldoon, Timothy J., 0U
Mulligan, Jeffrey A., 0D
Nozawa, Taisuke, 0X
Okawa, Minoru, 0E
Okada, Genki, 0E
Orth, Antony, 0C
Ota, Sadao, 0X
Ozeki, Yasuyuki, 0E, 0T, 0X
Park, Byungjun, 14
Powless, Amy J., 0U
Qiu, Yi, 18
Schonbrun, Ethan, 0C
Seo, M.-W., 03
Shimobaba, Tomoyoshi, 0E
Sugie, Takahisa, 0E
Takara, Tatsuki, 09
Takasawa, Taishi, 0J
Takeshita, Shingo, 09
Tang, Anson H. L., 11
Tang, Han, 0O
Tezuka, Hiroshi, 0D
Tomari, Hisanobu, 0D
Tsai, Kevin K., 04, 11
Tsumura, Norimichi, 0E
Ugawa, Masashi, 0X
Unracht, Gabrielle R., 0D
Wall, Laura, 0A
Wan, Yinan, 0R
Wang, Lihong V., 08
Wang, Yahui, 18
Wang, Yexin, 07
Wang, Yisen, 0T
Conference Committee

Symposium Chairs

James G. Fujimoto, Massachusetts Institute of Technology (United States)
R. Rox Anderson, Wellman Center for Photomedicine, Massachusetts General Hospital (United States) and Harvard School of Medicine (United States)

Program Track Chairs

Ammosi Periasamy, University of Virginia (United States)
Daniel L. Farkas, University of Southern California (United States) and Spectral Molecular Imaging, Inc. (United States)

Conference Chairs

Kevin K. Tsia, The University of Hong Kong (Hong Kong, China)
Keisuke Goda, The University of Tokyo (Japan)

Conference Co-chairs

Bahram Jalali, University of California, Los Angeles (United States)
Edmund Y. Lam, The University of Hong Kong (Hong Kong, China)
Kenneth Y. Wong, The University of Hong Kong (Hong Kong, China)

Conference Program Committee

Steven G. Adie, Cornell University (United States)
Mohammad Hossein Asghari, University of California, Los Angeles (United States)
Hongwei Chen, Tsinghua University (China)
Mark Foster, Johns Hopkins University (United States)
Yasuyuki Ozeki, The University of Tokyo (Japan)
Tomoyoshi Shimobaba, Chiba University (Japan)
Peter T. C. So, Massachusetts Institute of Technology (United States)
Lei Tian, University of California, Berkeley (United States)
Chao Wang, University of Kent (United Kingdom)
Lihong V. Wang, Washington University in St. Louis (United States)
Zeev Zalevsky, Bar-Ilan University (Israel)
Session Chairs

1. **Ultrafast Imaging**  
   *Kevin K. Tsia*, The University of Hong Kong (Hong Kong, China)

2. **Computational Imaging**  
   *Mark A. Foster*, Johns Hopkins University (United States)

3. **Big Data Instrumentation and Management**  
   *Yasuyuki Ozeki*, The University of Tokyo (Japan)

4. **High-Speed Nonlinear Imaging**  
   *Hideharu Mikami*, The University of Tokyo (Japan)

5. **4D Imaging**  
   *Steven G. Adie*, Cornell University (United States)

6. **Light-Sheet Microscopy**  
   *Kenneth K. Y. Wong*, The University of Hong Kong (Hong Kong, China)

7. **Instrumentation for High-Speed Imaging and Spectroscopy**  
   *Cheng Lei*, The University of Tokyo (Japan)

8. **Imaging Flow Cytometry**  
   *Keisuke Goda*, The University of Tokyo (Japan)