

PROCEEDINGS OF SPIE

# ***Computational Imaging V***

**Lei Tian**  
**Jonathan C. Petrucci**  
**Chrysanthe Preza**  
*Editors*

**27 April – 8 May 2020**  
**Online Only, United States**

*Sponsored and Published by*  
SPIE

**Volume 11396**

Proceedings of SPIE 0277-786X, V. 11396

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 *Computational Imaging V*, edited by Lei Tian, Jonathan C. Petrucci, Chrysanthe Preza, Proceedings of SPIE Vol. 11396 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510635692

ISBN: 9781510635708 (electronic)

Published by

**SPIE**

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

Telephone +1 360 676 3290 (Pacific Time) Fax +1 360 647 1445

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

Copyright © 2020, Society of Photo-Optical Instrumentation Engineers.

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](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. The CCC fee code is 0277-786X/20/\$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.

**SPIE. DIGITAL  
LIBRARY**

[SPIDigitalLibrary.org](http://SPIDigitalLibrary.org)

---

**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

---

## AI IN COMPUTATIONAL IMAGING

---

11396 03     **A data-driven approach to sampling matrix selection for compressive sensing** [11396-2]

---

## UNCONVENTIONAL COMPUTATIONAL IMAGING

---

11396 07     **Computational reconfigurable imaging spectrometer (CRISP) (Invited Paper)** [11396-6]

---

## COMPUTATIONAL IMAGING IN BIOMEDICAL IMAGING

---

11396 0A     **Extended retinex and optimized image sharpening for hidden detail uncovering, visual range improvement, and image enhancement** [11396-10]

---

## COMPUTATIONAL SPATIO-TEMPORAL IMAGING

---

11396 0B     **Blending physics with artificial intelligence (Invited Paper)** [11396-11]

---

## COMPUTATIONAL MICROSCOPY

---

11396 0I     **3D deconvolution in Fourier integral microscopy** [11396-18]

---

## COMPRESSIVE IMAGING

---

11396 0N     **Hardware parallel architecture proposed to accelerate the orthogonal matching pursuit compressive sensing reconstruction** [11396-23]

---

## COMPUTATIONAL IMAGING WITH DIFFRACTIVE OPTICS

---

11396 0O     **Compact vortex wavefront coding camera (Invited Paper)** [11396-24]

11396 0P     **A computational super-resolution technique based on coded aperture imaging** [11396-25]

- 11396 0Q **Total variation vs L1 regularization: a comparison of compressive sensing optimization methods for chemical detection** [11396-26]
- 11396 0R **Experimental demonstration of multi-spectral imaging of vegetation with a diffractive plenoptic camera** [11396-27]
- 11396 0S **A generalized approach for digital holographic recording and reconstruction** [11396-28]