

PROCEEDINGS OF SPIE

Optoelectronic Imaging and Multimedia Technology VI

Qionghai Dai
Tsutomu Shimura
Zhenrong Zheng
Editors

21–23 October 2019
Hangzhou, China

Sponsored by
SPIE
COS—Chinese Optical Society

Cooperating Organizations

Tsinghua University (China) • Peking University (China) • University of Science and Technology of China (China) • Zhejiang University (China) • Tianjin University (China) • Beijing Institute of Technology (China) • Beijing University of Posts and Telecommunications (China) • Nankai University (China) • Changchun University of Science and Technology (China) • University of Shanghai for Science and Technology (China) • Capital Normal University (China) • Huazhong University of Science and Technology (China) • Beijing Jiaotong University (China) • China Jiliang University (China) • Shanghai Institute of Optics and Fine Mechanics, CAS (China) • Changchun Institute of Optics, Fine Mechanics and Physics, CAS (China) • Institute of Semiconductors, CAS (China) • Institute of Optics and Electronics, CAS (China) • Institute of Physics, CAS (China) • Shanghai Institute of Technical Physics, CAS (China) • China Instrument and Control Society (China) • Japan Optical Society (Japan) • Korea Optical Society (Korea, Republic of) • Australia Optical Society (Australia) • Singapore Optical Society (Singapore) • European Optical Society

Supporting Organizations

China Association for Science and Technology (CAST) (China)
Department of Information of National Nature Science Foundation, China (NSFC) (China)

Published by
SPIE

Volume 11187

Proceedings of SPIE 0277-786X, V. 11187

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.

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 *Optoelectronic Imaging and Multimedia Technology VI*, edited by Qionghai Dai, Tsutomu Shimura, Zhenrong Zheng, Proceedings of SPIE Vol. 11187 (SPIE, Bellingham, WA, 2019) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510630918

ISBN: 9781510630925 (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

Copyright © 2019, 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. 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/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.

SPIE. DIGITAL LIBRARY

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

vii	<i>Authors</i>
ix	<i>Symposium Committees</i>
xiii	<i>Conference Committee</i>

DEPTH AND LIGHT FIELD

11187 02	High-resolution and real-time spectral-depth imaging with a compact system (Invited Paper) [11187-1]
11187 03	Realizing high angular resolution multi-view and light-field displays with multi-projection technique [11187-2]
11187 04	Monocular depth estimation based on unsupervised learning [11187-3]
11187 05	A learning-based method using epipolar geometry for light field depth estimation [11187-4]
11187 06	Light field SLAM based on ray-space projection model [11187-5]

COMPUTER VISION

11187 07	Dynamic-stride-net: deep convolutional neural network with dynamic stride (Invited Paper) [11187-6]
11187 08	No-reference image quality assessment based on an objective quality database and deep neural networks [11187-7]
11187 09	Video quality assessment based on LOG filtering of videos and spatiotemporal slice images [11187-8]
11187 0A	No-reference video quality assessment based on spatiotemporal slice images and deep convolutional neural networks [11187-9]
11187 0B	An efficient stereo matching based on superpixel segmentation [11187-10]

COMPUTATIONAL OPTICS

11187 0D	Optical coding of SPAD array and its application in compressive depth and transient imaging [11187-13]
----------	--

- 11187 OE **Lensless wide-field imaging and depth sensing through a turbid scattering layer by round-trip field estimation** [11187-14]
- 11187 OG **Single-pixel depth imaging** [11187-16]

COMPUTATIONAL ACQUISITION AND ANALYSIS I

- 11187 OI **Joint-designed achromatic diffractive optics for full-spectrum computational imaging (Invited Paper)** [11187-17]
- 11187 OK **Hole filling algorithm for image array of one-dimensional integrated imaging** [11187-19]

COMPUTATIONAL ACQUISITION AND ANALYSIS II

- 11187 OM **High-SNR single-pixel phase imaging in the UV+VIS+NIR range (Invited Paper)** [11187-21]
- 11187 ON **Underwater image color correction algorithm based on scattering statistical characteristics** [11187-22]
- 11187 OO **Effective 3D object reconstruction from densely sampled circular light fields** [11187-23]
- 11187 OQ **No-reference quality assessment for synthesized images based on local geometric distortions** [11187-25]
- 11187 OS **Light field planar homography and its application** [11187-27]
- 11187 OT **Solving computer vision tasks with diffractive neural networks** [11187-70]

COMPUTER VISION I

- 11187 OU **Abnormal events detection method for surveillance video using an improved autoencoder with multi-modal input (Invited Paper)** [11187-28]
- 11187 OV **Multispectral demosaicing via non-local low-rank regularization** [11187-29]
- 11187 OW **Attention-guided GANs for human pose transfer** [11187-30]
- 11187 OY **Supervoxel based point cloud segmentation algorithm** [11187-32]
- 11187 OZ **Intermediate deep-feature compression for multitasking** [11187-33]

COMPUTER VISION II

- 11187 10 **Interactive gigapixel video streaming via multiscale acceleration (Invited Paper)** [11187-34]
- 11187 12 **Semantic image inpainting with dense and dilated deep convolutional autoencoder adversarial network** [11187-36]
- 11187 13 **Multiple hidden-targets recognizing and tracking based on speckle correlation method** [11187-37]

IMAGE PROCESSING

- 11187 14 **Deep-learning for super-resolution full-waveform lidar (Invited Paper)** [11187-38]
- 11187 16 **Viewport-adaptive 360-degree video coding using non-uniform tile for virtual reality communication** [11187-40]
- 11187 17 **Cloud and snow detection from remote sensing imagery based on convolutional neural network** [11187-41]
- 11187 18 **Surface defect recognition of varistor based on deep convolutional neural networks** [11187-43]

POSTER SESSION

- 11187 19 **Facial action units recognition by de-expression residue learning** [11187-42]
- 11187 1A **Effect of defocus blur on the signal distribution of camera-based remote photoplethysmography** [11187-44]
- 11187 1B **Optical hash function based on the interaction between multiple scattering media and coherent radiation** [11187-45]
- 11187 1C **Binocular camera trap for wildlife detection** [11187-46]
- 11187 1E **Infrared object image instance segmentation based on improved mask-RCNN** [11187-48]
- 11187 1F **Structural light 3D reconstruction algorithm based on deep learning** [11187-49]
- 11187 1G **Spectral sensitivity estimation of color digital camera based on color checker** [11187-50]
- 11187 1H **An L0 regularized framelet based model for high-density mixed-impulse noise and Gaussian noise removal** [11187-51]

- 11187 1J **Stereo matching using convolution neural network and LIDAR support point grid** [11187-53]
- 11187 1L **Measuring the point spread function of a wide-field fluorescence microscope** [11187-55]
- 11187 1N **A competition-based image saliency model** [11187-57]
- 11187 1O **Generation of elemental image array based on photon mapping** [11187-58]
- 11187 1P **Brain MRI image classification based on transfer learning and support vector machine**
[11187-59]
- 11187 1Q **Multifunctional image processor based on rank differences signals weighing-selection
processing method and their simulation** [11187-60]
- 11187 1R **Fast bundle adjustment using adaptive moment estimation** [11187-61]
- 11187 1T **A Lite Asymmetric DenseNet for effective object detection based on convolutional neural
networks (CNN)** [11187-63]
- 11187 1U **Image inpainting using layered fusion and exemplar-based** [11187-65]
- 11187 1V **BNU-LCSAD: a video database for classroom student action recognition** [11187-66]
- 11187 1W **Improvement of semi-supervised learning in real application scenarios** [11187-67]
- 11187 1X **Efficient spectral confocal meta-lens in the near infrared** [11187-69]