PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 8200

, "Front Matter: Volume 8200," Proc. SPIE 8200, 2011 International Conference on Optical Instruments and Technology: Optoelectronic Imaging and Processing Technology, 820001 (1 December 2011); doi: 10.1117/12.921662

SPIE.

Event: International Conference on Optical Instruments and Technology (OIT2011), 2011, Beijing, Beijing, China

PROCEEDINGS OF SPIE

*2011 International Conference on Optical
Instruments and Technology*

Optoelectronic Imaging and Processing Technology

**Toru Yoshizawa
Ping Wei
Jesse Zheng**
Editors

**6–9 November 2011
Beijing, China**

Sponsored by
CIS — China Instrument and Control Society
COS — The Chinese Optical Society
SPIE

Cooperating Organizations
Opto-Electronic – Mechanic Technology and System Integration Chapter, CIS (China) • Beijing
Institute of Technology (China) • University of Shanghai for Science and Technology (China)
Capital Normal University (China) • Optical Instrument Chapter, CIS (China) • Committee on
Optoelectronic Technology, COS (China) • Beijing Hamamatsu Photon Techniques Inc. (China)
Tianjin University (China) • Zhejiang University (China) • Tsinghua University (China)
Chongqing University (China) • Nanjing University (China) • Instrument Society of America
(China) • Institute of Measurement and Control (United Kingdom) • Hong Kong Institution of
Engineers (China) • The Society of Measurement and Control (Japan)

Published by
SPIE

Volume 8200

Proceedings of SPIE, 0277-786X, v. 8200

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

2011 International Conference on Optical Instruments and Technology: Optoelectronic Imaging and Processing Technology,
edited by Toru Yoshizawa, Ping Wei, Jesse Zheng, Proc. of SPIE Vol. 8200, 820001 · © 2011 SPIE · CCC code:
0277-786X/11/\$18 · doi: 10.1117/12.921662

Proc. of SPIE Vol. 8200 820001-1

The papers included 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. The papers published in these proceedings 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 this book:

Author(s), "Title of Paper," in *2011 International Conference on Optical Instruments and Technology: Optoelectronic Imaging and Processing Technology*, edited by Toru Yoshizawa, Ping Wei, Jesse Zheng, Proceedings of SPIE Vol. 8200 (SPIE, Bellingham, WA, 2011) Article CID Number.

ISSN 0277-786X

ISBN 9780819488411

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 © 2011, 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 \$18.00 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/11/\$18.00.

Printed in the United States of America.

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, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first 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, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four 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. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID number.

Contents

ix	<i>Symposium Committee</i>
xi	<i>Conference Committee</i>
xiii	<i>Introduction</i>

SESSION 1

8200 02	High-performance adaptive optics system with long-term stability using liquid-crystal-on-silicon spatial light modulator for high-resolution retinal imaging [8200-07] H. Huang, T. Inoue, H. Toyoda, T. Hara, Hamamatsu Photonics K.K. (Japan)
8200 03	Label-free imaging of intracellular motility by low-coherent quantitative phase microscope in reflection geometry [8200-11] T. Yamauchi, H. Iwai, Y. Yamashita, Hamamatsu Photonics K.K. (Japan)
8200 04	Real-time infrared imaging simulation in sea background based on field tests [8200-38] Z. Zhang, C. Wang, S. Yue, Huazhong Institute of Electro-Optics (China) and Wuhan National Lab. for Optoelectronics (China)
8200 05	Adaptive homochromatic disturbance elimination and feature selection based mean-shift vehicle tracking method [8200-32] J. Ding, B. Lei, P. Hong, C. Wang, Huazhong Institute of Electro-Optics (China) and Wuhan National Lab. for Optoelectronics (China)
8200 06	Vignetting correction for IRFPA-based train axle temperature measurement system [8200-30] G. Liu, D. Yan, X. Hu, H. Zhang, L. Zhu, Beijing Institute of Technology (China)
8200 07	Weak point target detection in the complicated infrared background [8200-33] P. Hong, C. Wang, Z. Zhang, Huazhong Institute of Electro-Optics (China) and Wuhan National Lab. for Optoelectronics (China)
8200 08	Reconstruction and processing of medical electronic endoscopic image based on white LED illumination [8200-54] J. Chen, L. Wang, H. Duan, Zhejiang Univ. (China)
8200 09	Restoring wavefront coded iris image through the optical parameter and regularization filter [8200-92] Y. Li, Y. He, G. Feng, Y. Hou, Y. Liu, Beijing Institute of Technology (China)
8200 0A	Spectral calibration of the real-time data gathering and spectrum rebuilding system based on FPGA [8200-104] N. Zhang, L. Zhang, X. Liu, W. Cao, Beijing Institute of Technology (China)

SESSION 2

- 8200 0B **A handheld laser range-gated imaging instrument for underwater rescue and observation** [8200-105]
Q. Zhang, W. Jin, S. Qiu, L. Li, Beijing Institute of Technology (China)
- 8200 0C **Optical design of wide waveband compact imaging spectrometer with fast speed** [8200-100]
L. Xu, Y. Ji, W. Shen, M. Tang, Soochow Univ. (China) and Key Lab. of Advanced Optical Manufacture Technologies (China)
- 8200 0D **New design method based on sagittal flat-field equipment of Offner type imaging spectrometer** [8200-101]
Y. Ji, R. Xue, L. Xu, R. Shi, H. He, W. Shen, Soochow Univ. (China)
- 8200 0E **An automatic peak detection algorithm for Raman spectroscopy based on wavelet transform** [8200-55]
Z. Cai, J. Wu, Soochow Univ. (China)

SESSION 3

- 8200 0F **Partially overlapped range images registration based on Fringe pattern profilometry** [8200-80]
X. He, J. Xi, Y. Yu, Univ. of Wollongong (Australia)
- 8200 0G **3D face recognition based on a modified ICP method** [8200-81]
K. Zhao, J. Xi, Y. Yu, J. F. Chicharo, Univ. of Wollongong (Australia)
- 8200 0H **Absolute phase calculation from one composite RGB fringe pattern image by wavelet transform algorithm** [8200-50]
Z. Wang, Z. Jing, Z. Zhang, Hebei Univ. of Technology (China); T. Guo, Tianjin Univ. (China); S. Zhang, Hebei Univ. of Technology (China); X. Hu, Tianjin Univ. (China)
- 8200 0I **Fluctuation elimination of fringe pattern to improve the accuracy of phase calculation** [8200-51]
S. Huang, Z. Zhang, Hebei Univ. of Technology (China); T. Guo, Tianjin Univ. (China); S. Zhang, Hebei Univ. of Technology (China); X. Hu, Tianjin Univ. (China)

SESSION 4

- 8200 0J **A specific measurement matrix in compressive imaging system** [8200-18]
F. Wang, P. Wei, Beijing Institute of Technology (China); J. Ke, Univ. of Hong Kong (Hong Kong, China)
- 8200 0K **Measurement and study on signal-to-noise ratio of a spaceborne camera** [8200-12]
Y. Chen, J. Zhou, X. Chen, Y. Ji, W. Shen, Soochow Univ. (China)
- 8200 0L **Complete calibration of a phase-based 3D imaging system based on fringe projection technique** [8200-59]
S. Meng, H. Ma, Z. Zhang, Hebei Univ. of Technology (China); T. Guo, Tianjin Univ. (China); S. Zhang, Hebei Univ. of Technology (China); X. Hu, Tianjin Univ. (China)

- 8200 OM **An approach of system calibration for UAV photogrammetry** [8200-84]
P. Liu, Shenzhen Institutes of Advanced Technology (China); X. Chen, Shenzhen Institutes of Advanced Technology (China) and Xinjiang Institute of Ecology and Geography (China); L. Yang, Xinjiang Institute of Ecology and Geography (China)

SESSION 5

- 8200 ON **The decoding system of semi-active laser guidance based on FPGA** [8200-46]
C. Qi, L. Feng, Y. Feng, B. Wang, B. Chen, X. Luo, Beijing Institute of Technology (China)
- 8200 OO **A wireless video monitoring system based on 3G communication technology** [8200-65]
Z.-H. Xia, X.-S. Wang, Yangtze Univ. (China)
- 8200 OP **Pork grade evaluation using hyperspectral imaging techniques** [8200-62]
R. Zhou, B. Cai, S. Wang, H. Ji, H. Chen, China Jiliang Univ. (China)

POSTER SESSION

- 8200 OQ **Study of combined filter based on wavelet transform to denoise stripe images of electronic speckle shearography pattern interferometry** [8200-05]
Z. Liu, Beijing Institute of Technology (China) and Science and Technology on Optical Radiation Lab. (China); C. Jing, Science and Technology on Optical Radiation Lab. (China); Y. Zhang, Beijing Institute of Technology (China)
- 8200 OR **Research on removing cloud from optical images** [8200-08]
X. Zhu, Changzhou Institute of Technology (China) F. Wu, Changzhou Institute of Technology (China) and Soochow Univ. (China)
- 8200 OS **High dynamic range infrared image detail enhancement based on histogram statistical stretching and gradient filtering** [8200-14]
B. Liu, W. Jin, X. Wang, C. Xu, Beijing Institute of Technology (China)
- 8200 OT **A novel method of drift-scanning stars suppression based on the standardized linear filter** [8200-15]
J. Lin, X. Ping, G. Hou, D. Ma, Zhengzhou Information Science and Technology Institute (China)
- 8200 OU **A novel contrast enhancement algorithm in IR imaging systems** [8200-17]
X. Chen, Beijing Institute of Technology (China) and North System Engineering Institute (China); S. Yu, Y. Li, C. Di, Y. Cao, North System Engineering Institute (China)
- 8200 OV **Target detection against strong light based on gate viewing** [8200-19]
X. Wang, Y. Zhou, S. Fan, Y. Liu, Institute of Semiconductors (China)
- 8200 OW **Analysis of vibration influence on synthetic aperture lidar imaging** [8200-22]
X. Lv, S. Hao, J. Leng, State Key Lab. of Pulsed Power Laser Technology (China)
- 8200 OX **Lifetime computing algorithms based on exponential pattern retrieve and polynomial fitting in fluorescence lifetime imaging microscopy** [8200-23]
C. Liu, Y. Zhou, X. Wang, Y. Liu, Institute of Semiconductors (China)

- 8200 0Y **Image segmentation algorithm for wheel set measuring based on region growing** [8200-25]
Q. Shi, K. Wu, Hangzhou Dianzi Univ. (China)
- 8200 0Z **Eye-safety analysis of infrared laser imaging for security surveillance** [8200-27]
J. Yang, Sr., Changchun Univ. of Science and Technology (China) and Optoelectronic System Lab., Institute of Semiconductors (China); X. Wang, Optoelectronic System Lab., Institute of Semiconductors (China); X. Shi, Changchun Univ. of Science and Technology (China); Y. Zhou, Optoelectronic System Lab., Institute of Semiconductors (China)
- 8200 10 **The study of real-time denoising algorithm based on parallel computing for the MEMS IR imager** [8200-28]
C. Gong, M. Hui, L. Dong, Y. Zhao, Beijing Institute of Technology (China)
- 8200 11 **A new mixed noise filtering method for laser image** [8200-34]
X. Kang, W. Zhu, K. Li, M. Zhang, Beijing Institute of Technology (China)
- 8200 12 **Research on blind restoration for mix blurred image based on super-resolution method** [8200-39]
L. Zhao, L. Yan, Beijing Institute of Technology (China)
- 8200 13 **Image enhancement of restored motion blurred images** [8200-40]
L. Zhao, Beijing Institute of Technology (China)
- 8200 14 **Three-dimensional shape measurement of specular surfaces by orthogonal composite fringe reflection** [8200-41]
P. Xie, M. Tang, X. Wei, Soochow Univ. (China)
- 8200 15 **Lidar reflective tomography imaging for space object** [8200-42]
F. Qu, Y. Hu, D. Wang, Electronic Engineering Institute (China)
- 8200 16 **Research on vision-based error detection system for optic fiber winding** [8200-43]
W. Lu, H. Li, D. Yang, M. Zhang, Beihang Univ. (China)
- 8200 17 **High-speed, high-resolution, real-time road shape scanning measurement** [8200-48]
P. Ren, P. Wei, Beijing Institute of Technology (China)
- 8200 18 **A color image segmentation algorithm by integrating watershed with automatic seeded region growing and merging** [8200-58]
G. Xu, Y. Bu, Anhui Univ. of Technology (China); L. Wang, Zhejiang Univ. (China); H. Li, Anhui Univ. of Technology (China)
- 8200 1A **Evaluation and denoising of high-speed image noise based on power spectrum and wavelet denoising** [8200-66]
W. Zhu, J. Jiang, M. Liu, X. Kang, Beijing Institute of Technology (China); L. Ren, China North Industries Group Corp. (China)
- 8200 1B **A novel method for gray centroid of sunlight based on image recognition** [8200-68]
F. Yu, Z. Lin, C. Wu, Beijing Institute of Space Mechanics & Electricity (China); Y. Zhao, Beijing Institute of Technology (China)
- 8200 1C **Measuring BRDF using a single still digital camera** [8200-73]
H. Xiong, J. Xu, J. Wang, Guangdong Univ. of Technology (China)

- 8200 1D **Research on vision-based profile measurement of micro special-shaped component** [8200-77]
T. Geng, H. Wu, Y. Li, Harbin Engineering Univ. (China)
- 8200 1E **Research on the measurement method of geometric parameters of microstructure fiber end based on machine vision** [8200-85]
T. Geng, J. Diao, Y. Yang, Harbin Engineering Univ. (China)
- 8200 1F **Research on a near-lossless and high proportion image compression method based on WCP algorithm** [8200-86]
T. Geng, X. Han, Harbin Engineering Univ. (China)
- 8200 1G **Multifocus image fusion with trace-based structure tensor** [8200-88]
F. Luo, B. Lu, C. Miao, Henan Polytechnic Univ. (China)
- 8200 1H **Multiple targets tracking in infrared image sequences based on joint probabilistic data association** [8200-91]
D. Wu, Z. Peng, Univ. of Electronic Science and Technology of China (China)
- 8200 1I **The experiment study of image acquisition system based on 3D machine vision** [8200-93]
H. Zhou, Z. Xiao, X. Zhang, Z. Wei, Guilin Univ. of Electronic Technology (China)
- 8200 1J **An interactive region merging method** [8200-94]
R. Wu, Minjiang Univ. (China)
- 8200 1K **Scale parameter-estimating method for adaptive fingerprint pore extraction model** [8200-96]
Y. Yi, L. Cao, Tsinghua Univ. (China); W. Guo, Y. Luo, Chinese People's Public Security Univ. (China); Q. He, G. Jin, Tsinghua Univ. (China)
- 8200 1L **Motion-blur parameter estimation of remote sensing image based on quantum neural network** [8200-102]
K. Gao, X. Li, Y. Zhang, Y. Liu, Key Lab. of Photoelectronic Imaging Technology and System (China) and Beijing Institute of Technology (China)
- 8200 1M **Sequence arrangement of wavelet transform for nonuniformity correction in infrared focal-plane arrays** [8200-111]
X. Xie, Harbin Institute of Technology (China) and Heilongjiang Institute of Science and Technology (China); W. Zhang, M. Zhao, X. Zhi, F. Wang, Harbin Institute of Technology (China)
- 8200 1N **Design of the typical altered mineral spectral feature database system on the area of oil and gas migration** [8200-112]
X. Liu, Beijing Institute of Technology (China); X. Chen, Q. Li, G. Ni, Beijing Institute of Technology (China)

Author Index

Symposium Committee

General Chairs

Songlin Zhuang, University of Shanghai for Science and Technology (China)

Brian Culshaw, University of Strathclyde (United Kingdom)

Conference Cochairs

Yuri Chugui, New Siberia Academy of Sciences (Russian Federation)

Arthur Chiou, National Yang-Ming University (Taiwan, China)

Shenghua Ye, Tianjin University (China)

Honorary Chairs

Daheng Wang, Chinese Academy of Sciences (China)

Guoguang Mu, Nankai University (China)

Bingkun Zhou, Tsinghua University (China)

Technical Program Chair

Guofan Jin, Tsinghua University (China)

Technical Program Cochairs

Jinxue Wang, SPIE

Yimo Zhang, Tianjin University (China)

Local Organizing Committee Chair

Youhua Wu, China Instrument and Control Society (China)

Local Organizing Committee Cochairs

Guoqiang Ni, Beijing Institute of Technology (China)

Daoyin Yu, Tianjin University (China)

Yulin Xi, Beijing Hamamatsu Photon Techniques Inc. (China)

General Secretary

Youhua Wu, China Instrument and Control Society (China)

Administrative Vice General Secretary

Boyu Ding, Beijing Institute of Technology (China)

Vice General Secretaries

Yuejin Zhao, Beijing Institute of Technology (China)

Tiegen Liu, Tianjin University (China)

Qionghui Feng, University of Shanghai for Science and Technology
(China)

Cunlin Zhang, Capital Normal University (China)

Local Organizing Committee

Duanyi Xu, Tsinghua University (China)

Weimin Chen, Chongqing University (China)

Hongda Chen, Institute of Semiconductors (China)

Shangzhong Jin, China Jiliang University (China)

Libo Yuan, Harbin Engineering University (China)

Chunqing Gao, Beijing Institute of Technology (China)

Shiqiao Qin, National University of Defense Technology (China)

Tian Lan, Beijing Institute of Technology (China)

Cuiling Li, Beijing Institute of Technology (China)

Liquan Dong, Beijing Institute of Technology (China)

Conference Committee

Conference Chairs

Toru Yoshizawa, Saitama Medical University (Japan)
Ping Wei, Beijing Institute of Technology (China)
Jesse Zheng, Photontech Instruments Corporation (Canada)

Program Committee

Tingzhu Bai, Beijing Institute of Technology (China)
Yi Dong, Shanghai Jiao Tong University (China)
Ruowei Gu, Opton Co., Ltd. (Japan)
Tangjun Li, Beijing Jiaotong University (China)
Peilin Liu, Shanghai Jiao Tong University (China)
Yinglong Liu, Central South University (China)
Cunwei Lu, Fukuoka Institute of Technology (Japan)
Tsutomu Shimura, The University of Tokyo (Japan)
Pingtao Wang, O&E Co., Ltd. (Japan)
Shengli Wu, Xi'an Jiaotong University (China)
Jingyun Zhang, Areo-creative Corporation (USA)
Qingchuan Zhang, University of Science and Technology of China (China)

Session Chairs

Session 1

Ping Wei, Beijing Institute of Technology (China)
Lingxue Wang, Beijing Institute of Technology (China)

Session 2

Jesse Zheng, Photontech Instruments Corporation (Canada)

Session 3

Jesse Zheng, Photontech Instruments Corporation (Canada)

Session 4

Jesse Zheng, Photontech Instruments Corporation (Canada)

Session 5

Jesse Zheng, Photontech Instruments Corporation (Canada)

Introduction

These proceedings are from the 2011 International Conference on Optical Instrument and Technology (OIT2011), held in Beijing, China, 7–9 November 2011. The conference was the third event following the success of OIT'08 and OIT'09 and was sponsored and supported by SPIE, China Instrument and Control Society (CIS), and the Chinese Optical Society (COS).

OIT2011 was a professional conference which was combined and focused on instrument science and related technology, and involved in many technical aspects such as detection; observation; information collection, transfer and storage; communication; economization on energy; environmental protection; inspection and prevention of food security, traffic safety and mine safety; measure and control for aviation and space engineering, etc.

These proceedings, a collection of six volumes, contain the accepted oral and poster papers presented at OIT2011. It is truly a great pleasure for me that the most recent progress in optical instrumentation technology is reported in the OIT2011 proceedings. I firmly believe that the papers included in these volumes will provide reference information in the most up-to-date techniques of optical instrumentation technology.

The OIT2011 conference collected over 330 papers from different countries or regions of the world. Over 300 authors came from more than 12 countries. This conference consists of eight oral sessions (and a one-day poster session): Optical Systems and Modern Optoelectronic Instruments; Optical Device & Integration; Optical Sensor and Applications; Opto-electronic Imaging and Processing Technology; Optoelectronic Measurement Technology and System; Solid State Lighting and Display Technologies; Holography, Speckle Pattern Interferometry and Application; Micro/Nano Manufacturing and Metrology. Published in these six volumes of the Proceedings of SPIE are close to 330 papers. The technical fields of the presented papers at the conference cover a lot of current advanced technologies. The cutting-edge technologies and applications of optical instruments are discussed. Quite a few invited papers describe exciting achievements in the fields of optical instrument technology. It is evident that the OIT2011 conference has provided an excellent platform for participants and colleagues in research and development to share the technical progress and to develop new partnerships or broaden new markets.

SPIE has given great support to organize this international conference by collaborating with us in the whole organizing process from abstract collection to the proceedings publication. COS has provided great support and assistance.

Finally, on behalf of CIS and conference general chairs, I would like to heartily thank our supporters and committee members for all they have done for this conference. Thanks also go to all authors for their contributions, to all of the participants and friends for their interest, especially those who have traveled great distances and taken time from their busy schedules to attend the conference. Thanks also go to the staff of CIS for their support. I am also grateful to the SPIE staff for their support and collaboration in publishing these six volumes.

Songlin Zhuang

Chairman, China Instrument and Control Society (CIS)