

PROCEEDINGS OF SPIE

# ***Fifth International Conference on Graphic and Image Processing (ICGIP 2013)***

**Yulin Wang  
Xudong Jiang  
Ming Yang  
David Zhang  
Xie Yi**  
*Editors*

**26–27 October 2013  
Hong Kong, China**

*Organized by*  
International Association of Computer Science and Information Technology (IACSIT)

*Sponsored by*  
The Hong Kong Polytechnic University (Hong Kong, China)  
Wuhan University (China)  
Nanyang Technological University (Singapore)  
Southern Polytechnic State University (United States)

*Published by*  
SPIE

**Volume 9069**

Proceedings of SPIE 0277-786X, V. 9069

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

Fifth International Conference on Graphic and Image Processing (ICGIP 2013), edited by Yulin Wang,  
Xudong Jiang, Ming Yang, David Zhang, Xie Yi, Proc. of SPIE Vol. 9069, 906901 · © 2014 SPIE  
CCC code: 0277-786X/14/\$18 · doi: 10.1117/12.2054189

Proc. of SPIE Vol. 9069 906901-1

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 *Fifth International Conference on Graphic and Image Processing (ICGIP 2013)*, edited by Yulin Wang, Xudong Jiang, Ming Yang, David Zhang, Xie Yi, Proceedings of SPIE Vol. 9069 (SPIE, Bellingham, WA, 2014) Article CID Number.

ISSN: 0277-786X

ISBN: 9781628410013

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 © 2014, 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](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/14/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.



[SPIDigitalLibrary.org](http://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>Conference Committee</i>
xi	<i>Introduction</i>

---

## IMAGE SYSTEMS, SIGNAL PROCESSING, AND SECURITY

---

9069 02	<b>Mammographic mass detection based on extended concentric morphology model</b> [9069-1] Y. Li, H. Chen, Beijing Jiaotong Univ. (China)
9069 03	<b>Realistic facial animation generation based on facial expression mapping</b> [9069-2] H. Yu, Univ. of Portsmouth (United Kingdom); O. Garrod, R. Jack, P. Schyns, Univ. of Glasgow (United Kingdom)
9069 04	<b>Simulation of ink diffusion on Xuan paper</b> [9069-3] D. Fan, H. Li, East China Normal Univ. (China)
9069 05	<b>Image super resolution with adaptive edge enhancement algorithm</b> [9069-4] J. Ngermplubpla, O. Chitsobhuk, King Mongkut's Institute of Technology Ladkrabang (Thailand)
9069 06	<b>Graph-based image completion using patch offsets and structure feature</b> [9069-5] W. Xue, R. Zhang, Univ. of Science and Technology of China (China)
9069 07	<b>Fingertips detection for human computer interaction system</b> [9069-6] Md. J. Alam, Deakin Univ. (Australia); G. Nasierding, Xinjiang Normal Univ. (China); A. Sajjanhar, M. Chowdhury, Deakin Univ. (Australia)
9069 08	<b>A geometric distortion correction method for lithographic watermarked authentication images</b> [9069-7] Y. Xie, J. Li, J. Wang, C. Liu, Hunan Univ. of Technology (China)
9069 09	<b>Parameter identification of blur image based on image gradient</b> [9069-8] X. Peng, X. Zhao, Z. Wang, National Univ. of Defense Technology (China)
9069 0A	<b>DCT-based just noticeable distortion for color image/video</b> [9069-10] K.-C. Liu, Taiwan Hospitality and Tourism College (Taiwan)
9069 0B	<b>Semi-automatic 2D-to-3D conversion of human-centered videos enhanced by age and gender estimation</b> [9069-11] M. B. Fard, U. Bayazit, Istanbul Technical Univ. (Turkey)
9069 0C	<b>Anisotropic progressive photon mapping</b> [9069-12] X. Liu, Institute of Software (China) and Univ. of Chinese Academy of Sciences (China); C. Zheng, Institute of Software (China)

- 9069 OD **The extraction of vascular axis based on signed distance function** [9069-13]  
Q. Hong, L. Chen, B. Wang, Q. Wu, Xiamen Univ. (China)
- 9069 OE **Study on global cloud computing research trend** [9069-14]  
F. Ma, Guizhou Normal Univ. (China) and Wuhan Univ. (China); N. Zhan, Wuhan Univ. (China)
- 9069 OF **A survey on the visualization and reconstruction of vasculatures** [9069-15]  
Q. Hong, Xiamen Univ. (China)
- 9069 OG **Automated identification of mitochondrial regions in complex intracellular space by texture analysis** [9069-16]  
T. D. Pham, Univ. of Aizu (Japan)
- 9069 OH **H.264/AVC digital fingerprinting based on spatio-temporal just noticeable distortion** [9069-17]  
K. Ait Saadi, Ctr. de Développement des Technologies Avancées (Algeria); A. Bouridane, Northumbria Univ. (United Kingdom); A. Guessoum, Saad Dahlab Univ. Blida (Algeria)
- 9069 OI **Pipeline inwall 3D measurement system based on the cross structured light** [9069-20]  
D. Shen, Z. Lin, L. Xue, Q. Zheng, Z. Wang, Shanghai Univ. (China)
- 9069 OJ **Analysis of artificially illuminated static indoor scenes** [9069-21]  
W. K. Lai, B. K. Yeap, L. L. Lim, Univ. Tunku Abdul Rahman (Malaysia); T. H. Maul, The Univ. of Nottingham Malaysia Campus (Malaysia)
- 9069 OK **Hepatic vessel segmentation from computed tomography using three-dimensional hyper-complex edge detection operator** [9069-22]  
Y. Ma, X. Li, South China Normal Univ. (China)
- 9069 OL **A study of extraction of petal region on flower picture using HSV color information** [9069-23]  
Y. Yanagihara, R. Nakayama, Ehime Univ. (Japan) and Daikin Industries, Ltd. (Japan)
- 9069 OM **Totally blind image quality assessment evaluator** [9069-24]  
S. Abdalmajeed, J. Shuhong, Harbin Engineering Univ. (China); L. Wei, Beijing Institute of Astronautical System Engineering (China)
- 9069 ON **Iterative contextual CV model for liver segmentation** [9069-25]  
H. Ji, J. He, X. Yang, Shanghai Jiao Tong Univ. (China) and Key Lab. of System Control and Information Processing (China)
- 9069 OO **Estimation of human emotions using thermal facial information** [9069-26]  
H. Nguyen, K. Kotani, F. Chen, Japan Advanced Institute of Science and Technology (Japan); B. Le, Univ. of Science (Viet Nam)
- 9069 OP **Analyzing the effect of the distortion compensation in reversible watermarking** [9069-28]  
S. Kim, H. J. Kim, Korea Univ. (Korea, Republic of)
- 9069 OQ **Reversible watermarking using edge based difference modification** [9069-29]  
X. Qu, S. Kim, H. Kim, Korea Univ. (Korea, Republic of)

- 9069 OR **Anomaly detection in hyperspectral imagery based on low-rank and sparse decomposition** [9069-30]  
X. Cui, Y. Tian, L. Weng, Y. Yang, Institute of Automation (China)
- 9069 OS **A method for affine invariant curve smoothing** [9069-31]  
T. Nishida, T. Toriu, Osaka City Univ. (Japan)
- 9069 OT **Touch interface for markless AR based on Kinect** [9069-32]  
C.-T. Hsieh, T.-K. Kuo, Tamkang Univ. (Taiwan); H.-C. Wang, Y.-K. Wu, L.-C. Chang, Institute for Information Industry (Taiwan)
- 9069 OU **Tensor decomposition-based color image watermarking** [9069-33]  
Y. He, Beijing Institute of Technology (China) and Xi'an Univ. of Technology (China); W. Liang, Beijing Institute of Technology (China); J. Liang, Xi'an Univ. of Technology (China); M. Pei, Beijing Institute of Technology (China)
- 9069 OV **Short-term forecasting of cloud images using local features** [9069-34]  
W. Jiang, F. Su, Beijing Univ. of Posts and Telecommunications (China); J. Zhang, IBM Research–China (China)
- 9069 OW **Belief propagation stereo matching algorithm using ground control points** [9069-36]  
Y. Yang, Q. Liang, L. Niu, Q. Zhang, Communication Univ. of China (China)
- 9069 OX **Line drawing simplification by stroke translation and combination** [9069-37]  
Y. Chien, W.-C. Lin, T.-S. Huang, J.-H. Chuang, National Chiao Tung Univ. (Taiwan)
- 9069 OY **Research on the three-dimensional measurement system based on the laser speckle projection** [9069-41]  
L. Liang, W. Zhao, T. Yue, P. Duan, China Aerodynamics Research and Development Ctr. (China)
- 9069 OZ **Robust visual tracking via spatio-temporal cue integration** [9069-42]  
Y. He, M. Pei, M. Yang, Y. Wu, W. Liang, Beijing Institute of Technology (China)
- 9069 10 **Low-complexity demosaicing via multiscale gradients** [9069-44]  
C.-Y. Su, Y.-H. Chen, National Taiwan Normal Univ. (Taiwan)
- 9069 11 **Statistical based MQ arithmetic coder** [9069-46]  
N. Noikaew, O. Chitsobhuk, King Mongkut's Institute of Technology Ladkrabang (Thailand)
- 9069 12 **Automatic image enhancement based on multi-scale image decomposition** [9069-47]  
L. Feng, Z. Wu, L. Pei, X. Long, BeiHang Univ. (China)
- 9069 13 **Offline signature verification using local binary pattern and octave pattern** [9069-48]  
S. Ahlawat, A. Goel, S. Prasad, P. Singh, Laxmi Niwas Mittal Institute of Information Technology (India)
- 9069 14 **An evaluation of color features for a resistor color classification under various illumination situations** [9069-49]  
Y. Mitani, Ube National College of Technology (Japan); Y. Hamamoto, Yamaguchi Univ. (Japan)

- 9069 15 **Adaptive pixel-selection using chaotic map lattices for image cryptography** [9069-51]  
J. Sittigorn, K. Paithoonwattanakij, C. Surawatpunya, King Mongkut's Institute of Technology Ladkrabang (Thailand)
- 9069 16 **A robust and fast line segment detector based on top-down smaller eigenvalue analysis** [9069-52]  
D. Liu, Y. Wang, Z. Tang, X. Lu, Peking Univ. (China)
- 9069 17 **Performance evaluation in color face hallucination with error regression model in MPCA subspace method** [9069-55]  
K. Asavaskulkiet, Mahidol Univ. (Thailand)
- 9069 18 **Vector features for image matching and image registration** [9069-57]  
J. Liang, Y. Zhou, East China Univ. of Science and Technology (China)
- 9069 1A **A new approach to preserve privacy data mining based on fuzzy theory in numerical database** [9069-59]  
R. Cui, H. J. Kim, Korea Univ. (Korea, Republic of)
- 9069 1B **Mass classification in mammogram with semi-supervised relief based feature selection** [9069-60]  
X. Liu, J. Liu, Wuhan Univ. of Science and Technology (China) and Hubei Province Key Lab. of Intelligent Information Processing and Real-time Industrial System (China); Z. Feng, Zhejiang Univ. of Technology (China); X. Xu, J. Tang, Wuhan Univ. of Science and Technology (China) and Hubei Province Key Lab. of Intelligent Information Processing and Real-time Industrial System (China)
- 9069 1C **Efficient color edge detection based on synthetic weighted multi-structure element morphology** [9069-62]  
P. Samutrak, J. Werapun, King Mongkut's Institute of Technology Ladkrabang (Thailand)
- 9069 1D **Highlight area inpainting guided by illumination model** [9069-63]  
Y. Wang, Z. Jiang, J. Shi, BeiHang Univ. (China)
- 9069 1E **A real-time orientation feature descriptor for portable devices** [9069-64]  
P. Yang, Z. Jiang, H. Feng, D. Zhao, BeiHang Univ. (China)
- 9069 1F **Rolling shutter image compensation based on humanoid robot NAO** [9069-65]  
S. Zhao, B. Zhao, F. Pan, D. Lan, L. Jiang, X. Hu, Northeastern Univ. (China)
- 9069 1G **Analysis on key problems of mountain torrent disaster loss assessment system in Liaohe River Basin** [9069-66]  
J. Chen, Nanchang Institute of Technology (China)
- 9069 1H **Smoke detection using GLCM, wavelet, and motion** [9069-88]  
T. Srisuwan, M. Ruchanurucks, Kasetsart Univ. (Thailand)

- 9069 1I **A GPU-based computer-assisted microscopy system for assessing the importance of different families of histological characteristics in cancer diagnosis** [9069-92]  
D. Glotsos, S. Kostopoulos, Technological Educational Institute of Athens (Greece); K. Sidiropoulos, Brunel Univ. (United Kingdom); P. Ravazoula, Univ. Hospital of Patras (Greece); I. Kalatzis, P. Asvestas, D. Cavouras, Technological Educational Institute of Athens (Greece)
- 9069 1J **Cutting line determination for plant propagation** [9069-93]  
L.-Y. Lo, National Cheng Kung Univ. (Taiwan); C.-C. Hsia, Industrial Technology Research Institute (Taiwan); H.-H. Sun, National Cheng Kung Univ. (Taiwan); H.-J. Chen, Industrial Technology Research Institute (Taiwan); X.-T. Wu, M.-C. Hu, National Cheng Kung Univ. (Taiwan)

---

#### ALGORITHMS, MACHINE LEARNING, AND APPLICATIONS

---

- 9069 1K **Local spatial binary pattern: a new feature descriptor for content-based image retrieval** [9069-67]  
Y. Xia, S. Wan, L. Yue, Univ. of Science and Technology of China (China)
- 9069 1L **Automatic spatiotemporal matching of detected pleural thickenings** [9069-68]  
K. Chaisaowong, RWTH Aachen Univ. (Germany) and King Mongkut's Univ. of Technology North Bangkok (Thailand); S. K. Keller, RWTH Aachen Univ. (Germany); T. Kraus, Univ. Hospital Aachen (Germany)
- 9069 1M **Automatic extraction of power lines by particle filtering from aerial images** [9069-69]  
F. Ye, F. Li, S. Hu, Nanchang Univ. (China)
- 9069 1N **Edge-preserving smoothing for image decomposition via a hybrid approach** [9069-70]  
Y. Wang, H. Liu, Z. Wu, Peking Univ. (China)
- 9069 1O **Automatic facial expression recognition based on features extracted from tracking of facial landmarks** [9069-71]  
D. Ghimire, J. Lee, Jeonbuk National Univ. (Korea, Republic of)
- 9069 1P **A new method for solving overfitting problem of gentle AdaBoost** [9069-72]  
S. Wu, H. Nagahashi, Tokyo Institute of Technology (Japan)
- 9069 1Q **Designing a serious game for historical heritage: a case study of Heerlen Roman bathhouse** [9069-73]  
W. Qi, NingBo Univ. of Technology (China) and Open Univ. Nederland (Netherlands)
- 9069 1R **A geometrical defect detection method for non-silicon MEMS part based on HU moment invariants of skeleton image** [9069-74]  
X. Cheng, X. Jin, Z. Zhang, J. Lu, Beijing Institute of Technology (China)
- 9069 1S **Robust normal estimation of point cloud with sharp features via subspace clustering** [9069-75]  
P. Luo, Z. Wu, C. Xia, L. Feng, B. Jia, BeiHang Univ. (China)

- 9069 1T **Font generation of personal handwritten Chinese characters** [9069-76]  
J.-W. Lin, Tunghai Univ. (Taiwan); C.-Y. Wang, C.-L. Ting, R.-I. Chang, National Taiwan Univ. (Taiwan)
- 9069 1U **Geodesic based conformal mesh parameterization** [9069-77]  
Q. Zou, Shenyang Institute of Automation (China) and Univ. of Chinese Academy of Sciences (China); J. Zhao, Shenyang Institute of Automation (China); Y. Zhao, Shenyang Institute of Automation (China) and Univ. of Chinese Academy of Sciences (China); G. Liu, Shenyang Institute of Automation (China); H. Jin, Shenyang Institute of Automation (China) and Univ. of Chinese Academy of Sciences (China)
- 9069 1V **Line segment linking algorithm based on gradient orientation** [9069-79]  
B. Li, W. Wang, H. Ye, Tsinghua Univ. (China)
- 9069 1W **Strand structures detection for 2D shapes based on visibility** [9069-80]  
S. Wang, Z. Li, S. Miao, Y. Du, W. Qu, Dalian Maritime Univ. (China); J. Cao, Dalian Univ. of Technology (China)
- 9069 1X **Elastic cone for Chinese calligraphy** [9069-81]  
F. Cai, H. Li, East China Normal Univ. (China)
- 9069 1Y **Algebraic pattern recognition** [9069-82]  
M. R. Przybytek, Univ. of Warsaw (Poland)
- 9069 1Z **Image segmentation using random features** [9069-83]  
G. Bull, J. Gao, M. Antolovich, Charles Sturt Univ. (Australia)
- 9069 20 **Realistic page-turning of electronic books** [9069-84]  
C. Fan, H. Li, Y. Bai, East China Normal Univ. (China)
- 9069 21 **Simplified calculation of distance measure in DP algorithm** [9069-85]  
T. Hu, X. Ren, Y. Lu, Shenzhen Institute of Information Technology (China) and Shenzhen Key Lab. of Visual Media Processing and Transmission (China)
- 9069 22 **Based on GIS technology flood disaster assessment study of Fuhe River Basin** [9069-86]  
D. Wu, X. Zhao, J. Chen, Nanchang Institute of Technology (China)
- 9069 23 **Edge-guided filtering scheme for decomposition-based tone mapping** [9069-89]  
X. Wu, Z. Su, X. Luo, Sun Yat-sen Univ. (China)
- 9069 24 **Analysis of mammogram images based on texture features of curvelet sub-bands** [9069-90]  
S. J. S. Gardezi, I. Faye, Univ. Teknologi Petronas (Malaysia); Md. M. Eltoukhy, Univ. Teknologi Petronas (Malaysia) and Suez Canal Univ. (Egypt)
- 9069 25 **Quality assessment of color images based on the measure of just noticeable color difference** [9069-91]  
C.-H. Chou, Y.-H. Hsu, Tatung Univ. (Taiwan)

*Author Index*

# Conference Committee

## *Honorary Chair*

**David Zhang**, The Hong Kong Polytechnic University (Hong Kong, China)

## *Conference Chairs*

**Yulin Wang**, Wuhan University (China)

**Xudong Jiang**, Nanyang Technological University (Singapore)

**Ming Yang**, Southern Polytechnic State University (United States)

## *Program Committee*

**Sipi Dubey**, Chhattisgarh Swami Vivekanand Technical University (India)

**Iwan Setyawan**, Satya Wacana Christian University (Indonesia)

**Cheih-Ying Chen**, National Pingtung University of Education  
(Taiwan, China)

**Vít Voženílek**, Palacky University (Czech Republic)

## *Technical Committee*

**Tuan D. Pham**, University of Aizu (Japan)

**Chung-Yen Su**, National Taiwan Normal University (Taiwan, China)

**Ulug Bayazit**, Istanbul Technical University (Turkey)

**Zhuangzhi Wu**, Beihang University (China)

**Morshed Chowdhury**, Deakin University (Australia)

**Kraisorn Chaisaowong**, RWTH Aachen University (Germany)

**Rachael E. Jack**, Glasgow University (United Kingdom)

**Hassan Saleh**, Egyptian Atomic Energy Authority (Egypt)

**Mohamed Khider**, USTHB (Algeria)

**Thabit Sultan Mohammed**, Dhofar University (Oman)



## Introduction

The Organizing Committee warmly welcomed our distinguished delegates and guests to the 2013 Fifth International Conference on Graphic and Image Processing (ICGIP 2013) held 26–27 October 2013 in Hong Kong.

The ICGIP 2013 was organized and sponsored by International Association of Computer Science and Information Technology (IACSIT). The ICGIP 2013 was organized to gather members of our international community scientists so that researchers from around the world can present their leading-edge work, expanding our community's knowledge and insight into the significant challenges currently being addressed in that research. The conference program committee was itself quite diverse and truly international, with membership from the Americas, Europe, Asia, Africa, and Oceania.

These proceedings record the fully refereed papers presented at the conference. The main conference themes and tracks were graphic and image processing. The main goal of these events was to provide international scientific forums for exchange of new ideas in a number of fields that interact in-depth through discussions with their peers from around the world. Both inward research; core areas of graphic and image processing and outward research; multi-disciplinary, inter-disciplinary, and applications were covered during these events.

The conference solicited and gathered technical research submissions related to all aspects of major conference themes and tracks. All the submitted papers in the Proceedings have been peer reviewed by the reviewers drawn from the scientific committee, external reviewers and an editorial board depending on the subject matter of the paper. Reviewing and initial selection were undertaken electronically. After the rigorous peer-review process, the submitted papers were selected on the basis of originality, significance, and clarity for the purpose of the conference. The selected papers and additional late-breaking contributions to be presented as lectures made an exciting technical program. The conference program was extremely rich, featuring high-impact presentations.

The high quality of the program—guaranteed by the presence of an unparalleled number of internationally recognized top experts, can be assessed when reading the contents of the program. The conference was therefore a unique event, where attendees were able to appreciate the latest results in their field of expertise, and to acquire additional knowledge in other fields. The program was structured to favor interactions among attendees coming from many diverse horizons, scientifically, geographically, from academia and from industry.

We would like to thank the program chairs, organization staff, and the members of the program committees for their work.

We are grateful to all those who have contributed to the success of ICGIP 2013. We hope that all participants and other interested readers benefit scientifically from the Proceedings and also find it stimulating in the process.

We hope that you had a unique, rewarding, and enjoyable weekend at ICGIP 2013 in Hong Kong.

**Yulin Wang**