Front Matter: Volume 7872
Parallel Processing for Imaging Applications

John D. Owens
I-Jong Lin
Yu-Jin Zhang
Giordano B. Beretta
Editors

24–25 January 2011
San Francisco, California, United States

Sponsored and Published by
IS&T—The Society for Imaging Science and Technology
SPIE
Contents

SESSION 1 PARALLEL IMAGING SYSTEMS

7872 02 Using a commercial graphical processing unit and the CUDA programming language to accelerate scientific image processing applications [7872-01]
R. P. Broussard, R. W. Ives, U.S. Naval Academy (United States)

7872 03 Automatic distribution of vision-tasks on computing clusters [7872-02]
T. Müller, B. A. Tran, A. Knoll, Technische Univ. München (Germany)

7872 04 Highly scalable digital front end architectures for digital printing [7872-03]
D. Staas, Hewlett-Packard Co. (United States)

7872 05 Parallel training and testing methods for complex image processing algorithms on distributed, heterogeneous, unreliable, and non-dedicated resources [7872-04]
R. Usamentiaga, D. F. García, J. Molleda, I. Sainz, F. G. Builes, Univ. de Oviedo (Spain)

7872 06 Integrated parallel printing systems with hypermodular architecture (Invited Paper) [7872-05]
D. Biegelsen, L. Crawford, M. Do, D. Duff, C. Eldershaw, M. Fromherz, H. Hindi, Palo Alto Research Ctr., Inc. (United States); G. Koit, Xerox Corp. (United States); D. Larner, Palo Alto Research Ctr., Inc. (United States); B. Mandel, S. Moore, Xerox Corp. (United States); B. Preas, W. Ruml, G. Schmitz, L. Swartz, R. Zhou, Palo Alto Research Ctr., Inc. (United States)

SESSION 2 FROM IMAGE TO STRUCTURE I

7872 07 Parallel processing considerations for image recognition tasks (Invited Paper) [7872-06]
S. J. Simske, Hewlett-Packard Labs. (United States)

7872 08 GPGPU real-time texture analysis framework [7872-07]
M. A. Akhloufi, F. Gariepy, G. Champagne, Ctr. de Robotique et de Vision Industrielles (Canada)

7872 09 A parallel implementation of 3D Zernike moment analysis [7872-08]
D. Berjón, S. Arnaldo, F. Morán, Univ. Politécnica de Madrid (Spain)

7872 0A A novel parallel algorithm for airport runway segmentation in satellite images using priority directional region growing strategy based on ensemble learning [7872-09]
F. Duan, Y.-J. Zhang, Tsinghua Univ. (China)

7872 0B Visualization assisted by parallel processing [7872-10]
B. Lange, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France); H. Rey, X. Vasques, IBM (France); W. Puech, N. Rodriguez, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France)
SESSION 3  FROM IMAGE TO STRUCTURE II

7872 0C  A parallel impulse-noise detection algorithm based on ensemble learning for switching median filters [7872-11]
F. Duan, Y.-J. Zhang, Tsinghua Univ. (China)

SESSION 4  FROM STRUCTURE TO IMAGE I

7872 0D  GPU color space conversion [7872-12]
P. Chase, G. Vondran, Hewlett-Packard Co. (United States)

7872 0E  Acceleration of the Retinex algorithm for image restoration by GPGPU/CUDA [7872-13]
Y.-K. Wang, W.-B. Huang, Fu Jen Catholic Univ. (Taiwan)

7872 0F  Performance evaluation of Canny edge detection on a tiled multicore architecture [7872-14]
A. Z. Brethorst, N. Desai, D. P. Enright, R. Scrofano, The Aerospace Corp. (United States)

SESSION 5  FROM STRUCTURE TO IMAGE II

7872 0G  Video transcoding using GPU accelerated decoder [7872-15]
W.-L. Hsu, Advanced Micro Devices, Inc. (United States)

7872 0H  Real-time image deconvolution on the GPU [7872-16]
J. T. Klosowski, S. Krishnan, AT&T Labs. Research (United States)

7872 0I  Stitching giga pixel images using parallel computing [7872-17]
R. Kooper, P. Bajcsy, Univ. of Illinois at Urbana-Champaign (United States); N. M. Hernández, Univ. of La Laguna (Spain)

SESSION 6  SPEED VS. ACCURACY TRADE-OFF I

7872 0J  GPU-completeness: theory and implications [7872-18]
I.-J. Lin, Hewlett-Packard Labs. (United States)

7872 0K  A parallel error diffusion implementation on a GPU [7872-20]
Y. Zhang, Univ. of California, Davis (United States); J. L. Recker, Hewlett-Packard Labs. (United States); R. Ulichney, Hewlett-Packard Co. (United States); G. B. Beretta, I. Tastl, I.-J. Lin, Hewlett-Packard Labs. (United States); J. D. Owens, Univ. of California, Davis (United States)

7872 0L  Experience with imaging algorithms on multiple core CPUs [7872-21]
R. Moore, 3M Co. (United States)
SESSION 7  SPEED VS. ACCURACY TRADE-OFF II

7872 0M  Evaluation of CPU and GPU architectures for spectral image analysis algorithms [7872-22]  
V. Fresse, Univ. de Lyon (France), CNRS, Lab. Hubert Curien (France), and Univ. de Saint-Etienne, Jean-Monnet (France); D. Houzet, GIPSA Lab. (France); C. Gravier, Univ. de Lyon (France), Univ. de Saint-Etienne, Jean-Monnet (France), and TELECOM Saint-Etienne (France)

7872 0N  Computational scalability of large size image dissemination [7872-23]  
R. Kooper, P. Bajcsy, Univ. of Illinois at Urbana-Champaign (United States)

SESSION 8  IMAGING APPLICATIONS

7872 0P  Real-time 3D flash ladar imaging through GPU data processing [7872-25]  
C. M. Wong, C. Bracikowski, B. K. Baldauf, S. A. Havstad, Northrop Grumman Aerospace Systems (United States)

7872 0Q  Advanced MRI reconstruction toolbox with accelerating on GPU [7872-26]  
X.-L. Wu, Y. Zhuo, Univ. of Illinois at Urbana-Champaign (United States); J. Gai, Beckman Institute, Univ. of Illinois at Urbana-Champaign (United States); F. Lam, M. Fu, J. P. Haldar, W.-M. Hwu, Z.-P. Liang, B. P. Sutton, Univ. of Illinois at Urbana-Champaign (United States)

7872 0R  Accelerating image recognition on mobile devices using GPGPU [7872-27]  
M. Bordallo López, Univ. of Oulu (Finland); H. Nykänen, Visidon Ltd. (Finland); J. Hannuksela, O. Silvén, Univ. of Oulu (Finland); M. Vehviläinen, Nokia Research Ctr. (Finland)

7872 0S  Multi-view stereo reconstruction via voxel clustering and optimization of parallel volumetric graph cuts [7872-28]  
Y.-F. Zhu, Y.-J. Zhang, Tsinghua Univ. (China)

7872 0T  A GPU accelerated PDF transparency engine [7872-29]  
J. Recker, I.-J. Lin, I. Tastl, Hewlett-Packard Labs. (United States)

INTERACTIVE PAPER SESSION

7872 0U  Infrared small target tracking based on SOPC [7872-30]  
T. Hu, Hefei Electronic Engineering Institute (China); X. Fan, Hefei Electronic Engineering Institute (China) and Science and Technology Univ. of China (China); Y.-J. Zhang, Tsinghua Univ. (China); Z. Cheng, B. Zhu, Hefei Electronic Engineering Institute (China)

Author Index
Conference Committee

Symposium Chair

Sabine E. Süsstrunk, École Polytechnique Fédérale de Lausanne (Switzerland)

Symposium Cochair

Majid Rabbani, Eastman Kodak Company (United States)

Conference Chairs

John D. Owens, University of California, Davis (United States)
I-Jong Lin, Hewlett-Packard Laboratories (United States)
Yu-Jin Zhang, Tsinghua University (China)

Editor

Giordano B. Beretta, Hewlett-Packard Laboratories (United States)

Program Committee

Yen-Kuang Chen, Intel Corporation (United States)
Ngai-Man Cheung, Stanford University (United States)
Ajay Divakaran, Sarnoff Corporation (United States)
Mei Han, Google Inc. (United States)
Michael Houston, Advanced Micro Devices, Inc. (United States)
Wen-Mei Hwu, University of Illinois at Urbana-Champaign (United States)
Christopher R. Johnson, The University of Utah (United States)
Kurt W. Keutzer, University of California, Berkeley (United States)
Ron Kimmel, Technion-Israel Institute of Technology (Israel)
David P. Luebke, NVIDIA Corporation (United States)
Thomas Malzbender, Hewlett-Packard Laboratories (United States)
Marilyn C. Wolf, Georgia Institute of Technology (United States)
Robert A. Ulichney, Hewlett-Packard Laboratories (United States)

Session Chairs

1 Parallel Imaging Systems

Erwin Oertli, NVIDIA Corporation (United States)
2  From Image to Structure I
   Robert A. Ulichney, Hewlett-Packard Laboratories (United States)

3  From Image to Structure II
   Robert A. Ulichney, Hewlett-Packard Laboratories (United States)

4  From Structure to Image I
   Yu-Jin Zhang, Tsinghua University (China)

5  From Structure to Image II
   Ngai-Man Cheung, Stanford University (United States)

6  Speed vs. Accuracy Trade-off I
   Bill Buzbee, Google Inc. (United States)

7  Speed vs. Accuracy Trade-off II
   Bill Buzbee, Google Inc. (United States)

8  Imaging Applications
   Mei Han, Google Inc. (United States)