https://doi.org/10.2352/ISSN.2470-1173.2020.10.IPAS-A10

IS&T International Symposium on
Electronic Imaging
SCIENCE AND TECHNOLOGY

26 January 2020 — 30 January 2020 • Burlingame, CA, USA

PROCEEDINGS

Image Processing: Algorithms and Systems XVIII

Editors: **Sos S. Agaian**, College of Staten Island, CUNY (United States),
Karen 0. Egiazarian, Tampere Univ. of Technology (Finland),
Atanas P. Gotchev, Tampere Univ. of Technology (Finland)

These papers represent the program of Electronic Imaging 2020,
held 26 January — 30 January 2020, at the Hyatt Regency San Francisco Airport in Burlingame, CA.

Society for Imaging Science and Technology
7003 Kilworth Lane • Springfield, VA 22151 USA
703/642-9090; 703/642-9094 fax
info@imaging.org; www.imaging.org

ISSN 2470-1173
https://doi.org/10.2352/ISSN.2470-1173.2020.10.IPAS-A10
Manuscripts are reproduced from PDFs as submitted and approved by authors; no editorial changes have been made.

Image Processing: Algorithms and Systems XVIII

Conference overview

Image Processing: Algorithms and Systems continues the tradition of the past conference Nonlinear Image Processing and Pattern Analysis in exploring new image processing algorithms. It also reverberates the growing call for the integration of the theoretical research on image processing algorithms with the more applied research on image processing systems.

Specifically, the conference aims to:

- Promote knowledge of machine vision and image processing systems
- Promote understanding of quantum imaging practices
- Build modern imaging systems for new and emerging applications
- Inspire image-guided intervention
- Boost deep learning algorithm use in image processing products
- Inspire practical applications of the technology
- Facilitate the rapid transfer of research results to industry

Award
Best Paper

Paper authors listed as of 1 January 2020;
refer to manuscript for final authors.
Titles that are not listed with the proceedings
files were presentation-only.

IMAGE PROCESSING: ALGORITHMS AND SYSTEMS XVII

Monday, January 27, 2020

10:10 – 10:45 am Coffee Break

Image Processing with Machine Learning

Session Chairs: Sos Agaian, CSI City University of New York and The Graduate Center (CUNY) (United States); Karen Egiazarian, Tampere University (Finland); and Atanas Gotchev, Tampere University (Finland)

10:45 am – 12:30 pm
Harbour A/B

10:45
Conference Welcome

10:50 IPAS-025
Pruning neural networks via gradient information, *Pavlo Molchanov, NVIDIA Corporation (United States)*

11:10 IPAS-026
Real-world fence removal from a single-image via deep neural network, *Takuro Matsui, Takuro Yamaguchi, and Masaaki Ikehara, Keio University (Japan)*

11:30 IPAS-027
Adaptive context encoding module for semantic segmentation, *Congcong Wang[1], Faouzi Alaya Cheikh[1], Azeddine Beghdadi[2], and Ole Jakob Elle[3,4]; [1]Norwegian University of Science and Technology (Norway), [2]Universite Paris 13 (France), [3]Oslo University Hospital (Norway), and [4]University of Oslo (Norway)*

11:50 IPAS-028
CNN-based classification of degraded images, *Kazuki Endo[1], Masayuki Tanaka[1,2], and Masatoshi Okutomi[1]; [1]Tokyo Institute of Technology and [2]National Institute of Advanced Industrial Science and Technology (Japan)*

12:10 IPAS-029
A deep learning-based approach for defect detection and removing on archival photos, *Roman Sizyakin[1], Viacheslav Voronin[1,2], Nikolay Gapon[1], Evgeny Semenishchev[1,2], and Alexander Zelenskii[2]; [1]Don State Technical University and [2]Moscow State University of Technology "STANKIN" (Russian Federation)*

12:30 – 2:00 pm Lunch

PLENARY: Frontiers in Computational Imaging

Session Chairs: Radka Tezaur, Intel Corporation (United States), and Jonathan Phillips, Google Inc. (United States)

2:00 – 3:10 pm
Grand Peninsula Ballroom D

Imaging the Unseen: Taking the First Picture of a Black Hole, *Katie Bouman, assistant professor, Computing and Mathematical Sciences Department, California Institute of Technology (United States)*

For abstract and speaker biography, see page 7

Medical Image Processing

Session Chairs: Sos Agaian, CSI City University of New York and The Graduate Center (CUNY) (United States), and Atanas Gotchev, Tampere University (Finland)

3:30 – 4:30 pm
Harbour A/B

3:30 IPAS-062
An active contour model for medical image segmentation using a quaternion framework, *Viacheslav Voronin[1,2], Evgeny Semenishchev[1,2], Alexander Zelenskii[2], Marina Zhdanova[2], and Sos Agaian[3]; [1]Don State Technical University (Russian Federation), [2]Moscow State University of Technology "STANKIN" (Russian Federation), and [3]CSI City University of New York and The Graduate Center (CUNY) (United States)*

3:50 IPAS-063
Improving 3D medical image compression efficiency using spatiotemporal coherence, *Matina Zerva, Michalis Vrigkas, Lisimachos Kondi, and Christophoros Nikou, University of Ioannina (Greece)*

4:10 IPAS-064
Pathology image-based lung cancer subtyping using deep-learning features and cell-density maps, *Mustafa Jaber[1], Christopher Szeto[2], Bing Song[2], Liudmila Beziaeva[3], Stephen Benz[2], and Shahrooz Rabizadeh[2]; [1]NantOmics, [2]ImmunityBio, and [3]NantHealth (United States)*

5:00 – 6:00 pm All-Conference Welcome Reception

Tuesday, January 28, 2020

7:30 – 8:45 am Women in Electronic Imaging Breakfast; pre-registration required

Scene Understanding

Session Chairs: Sos Agaian, CSI City University of New York and The Graduate Center (CUNY) (United States), and Karen Egiazarian, Tampere University (Finland)

8:50 – 10:10 am
Harbour A/B

8:50 IPAS-094
Two-step cascading algorithm for camera-based night fire detection, *Minji Park, Donghyun Son, and ByoungChul Ko, Keimyung University (Republic of Korea)*

9:10 IPAS-095
Introducing scene understanding to person re-identification using a spatio-temporal multi-camera model, *Xin Liu, Herman Groot, Egor Bondarev, and Peter de With, Eindhoven University of Technology (the Netherlands)*

9:30 IPAS-096
Use of retroreflective markers for object detection in harsh sensing conditions, *Laura Goncalves Ribeiro, Olli Suominen, Sari Peltonen, and Atanas Gotchev, Tampere University (Finland)*

9:50 IPAS-097
A novel image recognition approach using multiscale saliency model and GoogLeNet, *Guoan Yang, Xi'an Jiaotong University (China)*

10:00 am – 7:30 pm Industry Exhibition - Tuesday

10:10 – 10:50 am Coffee Break

Image and Video Processing

Session Chairs: Sos Agaian, CSI City University of New York and The Graduate Center (CUNY) (United States); Karen Egiazarian, Tampere University (Finland); and Atanas Gotchev, Tampere University (Finland)

10:50 am – 12:30 pm
Harbour A/B

10:50 IPAS-133
Edge detection using the Bhattacharyya distance with adjustable block space, *Jiho Yoon and Chulhee Lee, Yonsei University (Republic of Korea)*

11:10 IPAS-134
Color interpolation algorithm for a periodic white-dominant RGBW color filter array, *Kyeonghoon Jeong, Jonghyun Kim, and Moon Gi Kang, Yonsei University (Republic of Korea)*

11:30 IPAS-135
Computational color constancy under multiple light sources, *Jaeduk Han, Soonyoung Hong, and Moon Gi Kang, Yonsei University (Republic of Korea)*

11:50 IPAS-136
Per clip Lagrangian multiplier optimisation for HEVC, *Daniel Ringis, François Pitié, and Anil Kokaram, Trinity College (Ireland)*

12:10 IPAS-137
An expandable image database for evaluation of full-reference image visual quality metrics, *Mykola Ponomarenko[1], Oleg Ieremeiev[2], Vladimir Lukin[2], and Karen Egiazarian[1]; [1]Tampere University (Finland) and [2]National Aerospace University (Ukraine)*

12:30 – 2:00 pm Lunch

PLENARY: Automotive Imaging

Session Chairs: Radka Tezaur, Intel Corporation (United States), and Jonathan Phillips, Google Inc. (United States)

2:00 – 3:10 pm
Grand Peninsula Ballroom D

Imaging in the Autonomous Vehicle Revolution, *Gary Hicok, senior vice president, hardware development, NVIDIA Corporation (United States)*

For abstract and speaker biography, see page 7

3:10 – 3:30 pm Coffee Break

Image Filtering and Enhancement

Session Chairs: Karen Egiazarian, Tampere University (Finland), and Atanas Gotchev, Tampere University (Finland)

3:30 – 5:30 pm
Harbour A/B

3:30 IPAS-177
Fractional contrast stretching for image enhancement of aerial and satellite images (JIST-first), *Thaweesak Trongtirakul[1], Werapon Chiracharit[1], and Sos Agaian[2]; [1]King Mongkut's University of Technology Thonburi (Thailand) and [2]CSI City University of New York and The Graduate Center (CUNY) (United States)*

3:50 IPAS-178
Image debanding using iterative adaptive sparse filtering, *Neeraj Gadgil, Qing Song, and Guan-Ming Su, Dolby Laboratories (United States)*

4:10 IPAS-179
Hyperspectral complex-domain image denoising: Cube complex-domain BM3D (CCDBM3D) algorithm, *Vladimir Katkovnik, Mykola Ponomarenko, Karen Egiazarian, Igor Shevkunov, and Peter Kocsis, Tampere University (Finland)*

4:30 IPAS-180
Color restoration of multispectral images: Near-infrared (NIR) filter-to-color (RGB) image, *Thaweesak Trongtirakul[1], Werapon Chiracharit[1], and Sos Agaian[2]; [1]King Mongkut's University of Technology Thonburi (Thailand) and [2]CSI City University of New York and The Graduate Center (CUNY) (United States)*

4:50 IPAS-181
Non-blind image deconvolution based on "ringing" removal using convolutional neural network, *Takahiro Kudo, Takanori Fujisawa, and Masaaki Ikehara, Keio University (Japan)*

5:10 IPAS-182
OEC-CNN: A simple method for over-exposure correction in photographs, *Zhao Gao[1], Eran Edirisinghe[1], and Viacheslav Chesnokov[2]; [1]Loughborough University and [2]ARM Limited (United Kingdom)*

5:30 – 7:30 pm Symposium Demonstration Session

Wednesday, January 29, 2020

10:00 am – 3:30 pm Industry Exhibition - Wednesday

10:10 – 11:00 am Coffee Break

12:30 – 2:00 pm Lunch

PLENARY: VR/AR Future Technology

Session Chairs: Radka Tezaur, Intel Corporation (United States), and Jonathan Phillips, Google Inc. (United States)

2:00 – 3:10 pm
Grand Peninsula Ballroom D

Quality Screen Time: Leveraging Computational Displays for Spatial Computing, *Douglas Lanman, director, Display Systems Research, Facebook Reality Labs (United States)*

For abstract and speaker biography, see page 7

3:10 – 3:30 pm Coffee Break

Image Processing: Algorithms and Systems XVIII Interactive Papers Session

5:30 – 7:00 pm
Sequoia
The following works will be presented at the EI 2020 Symposium Interactive Papers Session.

IPAS-310

CNN performance dependence on linear image processing, *Khalid Omer, Luca Caucci, and Meredith Kupinski, The University of Arizona (United States)*

WITHDRAWN IPAS-311

Elastic graph-based semi-supervised embedding with adaptive loss regression, *Fadi Dornaika and Youssof El Traboulsi, University of the Basque Country (Spain)*

IPAS-312

Generative adversarial networks: A short review, *Habib Ullah[1], Sultan Daud Khan[1], Mohib Ullah[2], and Faouzi Alaya Cheikh[2]; [1]University of Ha'il (Saudi Arabia) and [2]Norwegian University of Science and Technology (Norway)*

IPAS-313

Multiscale convolutional descriptor aggregation for visual place recognition, *Raffaele Imbriaco, Egor Bondarev, and Peter de With, Eindhoven University of Technology (the Netherlands)*

5:30 – 7:00 pm EI 2020 Symposium Interactive Posters Session

5:30 – 7:00 pm Meet the Future:
A Showcase of Student and Young Professionals Research

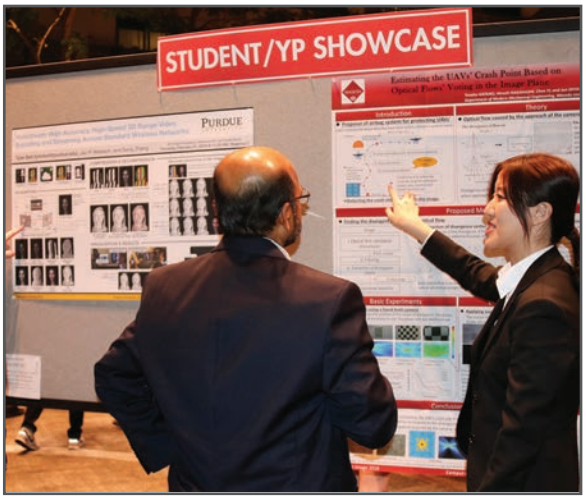
JOIN US AT THE NEXT EI!

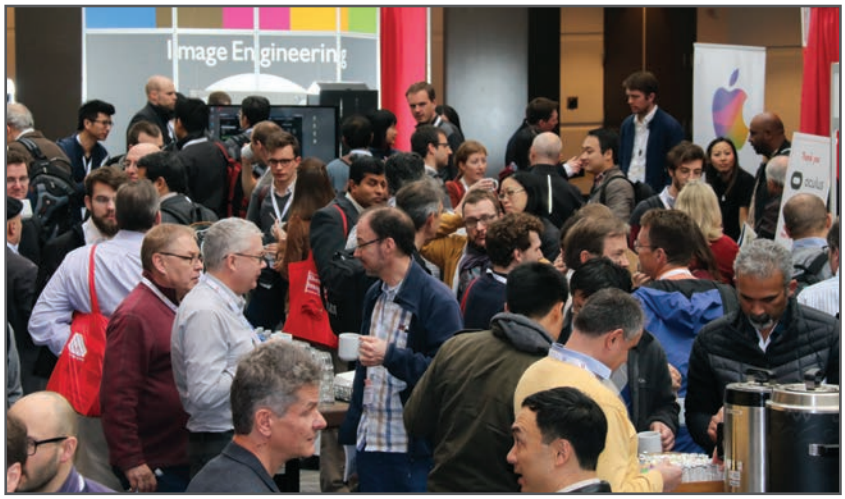
IS&T International Symposium on

Electronic Imaging

SCIENCE AND TECHNOLOGY

Imaging across applications . . . Where industry and academia meet!





• SHORT COURSES • EXHIBITS • DEMONSTRATION SESSION • PLENARY TALKS •
• INTERACTIVE PAPER SESSION • SPECIAL EVENTS • TECHNICAL SESSIONS •

www.electronicimaging.org

IS&T
imaging.org