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PROCEEDINGS

Image Processing: Algorithms and Systems XIX

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)

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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

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Image Processing: Algorithms and Systems XIX

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 integration of the theoretical research on image processing algorithms with the more applied research on image processing systems.

Specifically, the conference aims at highlighting the importance of the interaction between transform-, model-, and learning-based approaches for creating effective algorithms and building modern imaging systems for new and emerging applications.

Paper authors listed as of 1 January 2021; refer to manuscript for final authors. Titles that are not listed with the proceedings files were presentation-only.

Image Processing: Algorithms and Systems XIX

TUESDAY 19 JANUARY 2021

PLENARY: DEEP INTERNAL LEARNING—DEEP LEARNING WITH ZERO EXAMPLES

Session Chair: Charles Bouman, Purdue University (United States)
10:00 – 11:10

Deep internal learning—Deep learning with zero examples
Michal Irani, *professor, Department of Computer Science and Applied Mathematics, Weizmann Institute of Science (Israel)*

Michal Irani is a professor at the Weizmann Institute of Science. Her research interests include computer vision, AI, and deep learning. Irani's prizes and honors include the Maria Petrou Prize (2016), the Helmholtz "Test of Time Award" (2017), the Landau Prize in AI (2019), and the Rothschild Prize in Mathematics and Computer Science (2020). She also received the ECCV Best Paper Awards (2000 and 2002), and the Marr Prize Honorable Mention (2001 and 2005).

THURSDAY 21 JANUARY 2021

PLENARY: THE DEVELOPMENT OF INTEGRAL COLOR IMAGE SENSORS AND CAMERAS

Session Chair: Jonathan B. Phillips, Google Inc. (United States)
10:00 – 11:10

The development of integral color image sensors and cameras
Kenneth A. Parulski, *expert consultant: mobile imaging (United States)*

Kenneth Parulski is an expert consultant to mobile imaging companies and leads the development of ISO standards for digital photography. He joined Kodak in 1980 after graduating from MIT and retired in 2012 as research fellow and chief scientist in Kodak's digital photography division. His work has been recognized with a Technical Emmy and other major awards. Parulski is a SMPTE fellow and an inventor on more than 225 US patents.

MONDAY 25 JANUARY 2021

PLENARY: MAKING INVISIBLE VISIBLE

Session Chair: Jonathan B. Phillips, Google Inc. (United States)
10:00 – 11:10

Making invisible visible
Ramesh Raskar, *associate professor, MIT Media Lab (United States)*

Ramesh Raskar is an associate professor at MIT Media Lab and directs the Camera Culture research group. His focus is on AI and imaging for health and sustainability. They span research in physical (e.g., sensors, health-tech), digital (e.g., automated and privacy-aware machine learning), and global (e.g., geomaps, autonomous mobility) domains. He received the Lemelson Award (2016), ACM SIGGRAPH Achievement Award (2017), DARPA Young Faculty Award (2009), Alfred P. Sloan Research Fellowship (2009), TR100 Award from MIT Technology Review (2004), and Global Indus Technovator Award (2003). He has worked on special research projects at Google [X] and Facebook and co-founded/advised several companies.

TUESDAY 26 JANUARY 2021

VIDEO PROCESSING

Moderator: Jarmo Koponen, University of Eastern Finland, Ita-Suomen yliopisto, Kuopio, Pohjois-Savo, FI, Academic Finland (Finland) / **Session Chair:** Karen Egiazarian, Tampere University (Finland)
10:15 – 11:15

10:15 IPAS-258
Virtual adversarial training in feature space to improve unsupervised video domain adaptation, *Artjoms Gorpincenko, Geoff French, and Michal Mackiewicz, University of East Anglia (United Kingdom)*

10:35 IPAS-259
HEVC rate-distortion optimization with source modeling, *Ahmed Hamza[1], Mohamed Abdelazim[1], Abdelrahman Abdelazim[2], and Djamel Ait-Boudaoua[1]; [1]University of Portsmouth (United States) and [2]Blackpool and the Fylde College (United Kingdom)*

10:55 IPAS-260
A polar coordinate perspective on motion search in video coding, *Jingning Han, Paul Wilkins, and Yaowu Xu, Google Inc. (United States)*

IMAGE ANALYSIS

Moderator: Artjoms Gorpincenko, University of East Anglia (United Kingdom) / **Session Chair:** Atanas Gotchev, Tampere University (Finland)
11:45 – 12:45

11:45 IPAS-234
Real-time vehicle orientation classification and viewpoint-aware vehicle re-identification, *Tamas Oliver Kocsis, Tunc Alkanat, Egor Bondarev, and Peter de With, Eindhoven University of Technology (the Netherlands)*

12:05 IPAS-235
Text recognition of cardboard pharmaceutical packages by utilizing machine vision, *Jarmo Koponen, Keijo Haataja, and Pekka Toivanen, University of Eastern Finland (Finland)*

CONFERENCE INTERACTIVE POSTER

IPAS-226

IPAS POSTER: Projection methods for finding intersection of two convex sets and their use in signal processing problems, *Zuzana Bilkova[1,2];*

IMAGE DENOISING

Moderator: Jingning Han, Google Inc. (United States) / **Session Chair:** Karen Egiazarian, Tampere University (Finland)
13:15 – 14:15

13:15 IPAS-237

Decision-making on image denoising expedience, *Andrii Rubel[1], Oleksii Rubel[1], Vladimir Lukin[1], and Karen Egiazarian[2]; [1]National Aerospace University (Ukraine) and [2]Tampere University (Finland)*

13:35 IPAS-238

Benchmark of similar blocks search under noisy conditions, *Oleksii Rubel[1,2], Rostyslav Tsekhmystrc[1], Vladimir Lukin[1], and Karen Egiazarian[2]; [1]National Aerospace University (Ukraine) and [2]Tampere University (Finland)*

13:55 IPAS-239

Graph adversarial learning for noisy skeleton-based action recognition, *Henglin Shi, Wei Peng, Xin Liu, and Guoying Zhao, University of Oulu (Finland)*

MACHINE LEARNING FOR IMAGE PROCESSING

Moderator: Ikuro Sato, Denso IT Laboratory, Inc. (Japan) / **Session Chair:** Sos Agaian, CSI City University of New York and The Graduate Center (CUNY) (United States)
18:15 – 19:15

18:15 IPAS-246

Deep learning features for discriminating between benign and malignant microcalcification lesions, *Juan Wang[1], Liang Lei[2], and Yongyi Yang[1]; [1]Illinois Institute of Technology (United States) and [2]Chongqing University of Science and Technology (China)*

18:35 IPAS-247

Breast cancer tissue sub-region classification from second harmonic generation imagery via machine learning, *Wencheng Wu[1], Beilei Xu[1], Edgar Bernal[1], Robert Hill[2], Danielle Desa[1], and Edward Brown[1]; [1]University of Rochester and [2]Harmonigenic Inc. (United States)*

18:55 IPAS-248

Computer vision-based classification of schizophrenia patients from retinal imagery, *Diana Joseph, Adriann Lai, Steven Silverstein, Rajeev Ramchandran, and Edgar Bernal, University of Rochester (United States)*

IMAGE PROCESSING

Moderator: Diana Joseph, University of Rochester School of Medicine and Dentistry (United States) / **Session Chair:** Sos Agaian, CSI City University of New York and The Graduate Center (CUNY) (United States)
19:45 – 20:45

19:45 IPAS-240

Does end-to-end trained deep model always perform better than non-end-to-end counterpart?, *Ikuro Sato[1,2], Guoqing Liu[1], Kohta Ishikawa[1], Teppei Suzuki[1], and Masayuki Tanaka[2]; [1]Denso IT Laboratory, Inc. and [2]Tokyo Institute of Technology (Japan)*

20:05 IPAS-241

FPGA-based fast algorithm of correcting saturated pixel in image, *Jun Fu, Institute of Image Processing, School of Electronics & Information Engineering (China)*

WEDNESDAY 27 JANUARY 2021

PLENARY: REVEALING THE INVISIBLE TO MACHINES WITH NEUROMORPHIC VISION SYSTEMS: TECHNOLOGY AND APPLICATIONS OVERVIEW

Session Chair: Radka Tezaur, Intel Corporation (United States)
10:00 – 11:10

Revealing the invisible to machines with neuromorphic vision systems: Technology and applications overview
Luca Verre, *CEO and cc-founder, Prophesee (France)*

Luca Verre is cc-founder and CEO of Prophesee, the inventor of the world's most advanced neuromorphic vision systems. Verre is a World Economic Forum technology pioneer. His experience includes project and product management, marketing, and business development roles at Schneider Electric. Prior to Schneider Electric, Verre worked as a research assistant in photonics at the Imperial College of London. Verre holds a MSc in physics, electronic and industrial engineering from Politecnico di Milano and Ecole Centrale and an MBA from Institut Européen d'Administration des Affaires, INSEAD.