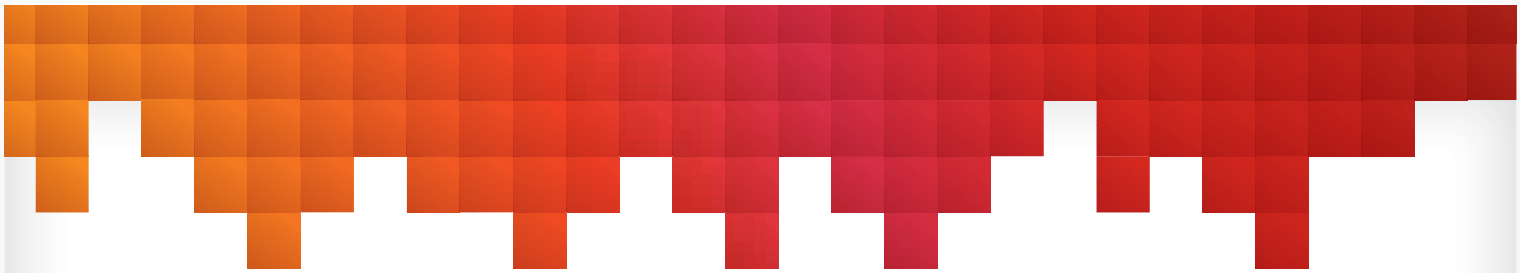
# IS&T / SPIE Electronic Imaging

## SCIENCE AND TECHNOLOGY

## 23-27 January 2011



## Technical Program

**Conferences and Courses**
23–27 January 2011

Hyatt Regency Hotel
San Francisco Airport, California, USA

**electronicimaging.org**

IS&T
imaging.org

SPIE

# Welcome

On behalf of IS&T—The Society for Imaging Science and Technology and SPIE, we would like to welcome you to the 23rd annual Symposium on Electronic Imaging. Imaging is pervasive in the human experience, be it photographs that we take in our everyday lives to those that are used in space exploration, medical imaging, entertainment, science, or national security.

This week at Electronic Imaging 2011, you will hear the latest research from the world's leading experts in imaging, image processing, sensors, applications, and imaging science and technology. You will also have many opportunities to develop both your career and business by networking with leading researchers and entrepreneurs in the field. Electronic Imaging 2011 is the premier international imaging symposium where you are on the forefront of research and innovation, and we look forward to seeing you this week.

*Symposium Chair:*
**Sabine Süsstrunk,** École Polytechnique Fédérale de Lausanne (Switzerland)

*Symposium Cochair:*
**Majid Rabbani,** Eastman Kodak Co. (United States)

*Symposium Steering Committee:*
**Sabine Süsstrunk,** Symposium Chair, École Polytechnique Fédérale de Lausanne (Switzerland)
**Majid Rabbani,** Symposium Cochair, Eastman Kodak Co.
**Jan P. Allebach,** Past Symposium Chair, Purdue Univ.
**Nitin Sampat,** Rochester Institute of Technology
**Suzanne E. Grinnan,** IS&T Executive Director
**Jeanne Anderson,** SPIE Event Manager
**Ron L. Scotti,** SPIE Science & Technology Advisor

*Short Course Chairs*
**Gaurav Sharma,** Univ. of Rochester
**Geoff Woolfe,** Canon Information Systems Research Australia Pty. Ltd. (Australia)

IS&T / SPIE

# Electronic Imaging

## SCIENCE AND TECHNOLOGY

**Technical Program**

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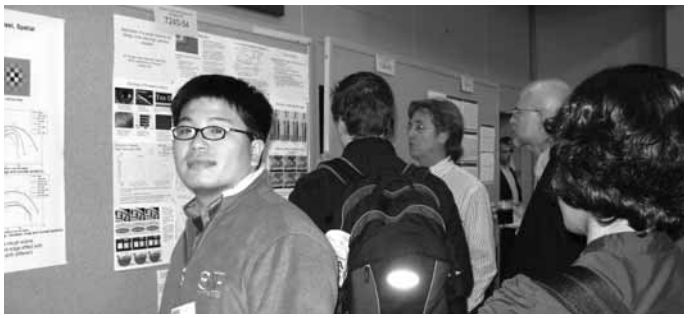
San Francisco Airport, California, USA

IS&T and SPIE would like to express deep appreciation to the symposium chairs, conference chairs, program committees, and session chairs who have so generously given of their time and advice to make this symposium possible. The symposium, like our other conferences and activities, would not be possible without the dedicated contribution of our participants and members.

This program is based on commitments received up to the time of publication and is subject to change without notice.

# Contents





## Technical Conferences

# Special Events

## 3D Theatre

*Grand Peninsula Ballroom A*

Monday 24 January. . . . . 5:30 to 7:30 pm

*Session Chairs:* **Andrew J. Woods,** Curtin Univ. (Australia); **Chris Ward,** Lightspeed Design, Inc.

This ever-popular session, part of the Stereoscopic Displays and Applications conference, allows attendees to see large-screen examples of 3D content from around the world. Program announced at the conference. 3D glasses provided.

## Interactive Paper and Symposium Demonstration Session

*Grand Peninsula Ballroom E*

Tuesday 25 January . . . . . 5:30 to 8:00 pm

### Interactive Paper Set Up, Viewing, and Presentations

**Author Set Up:**
Monday 24 January. . . . . 8 to 10 am

**General Viewing:**
Monday 24 January and Tuesday 25 January . . 10 am to 4 pm

**Interactive Paper Session:**

Tuesday 25 January . . . . . 5:30 to 7:00 pm

Conference attendees are encouraged to attend the Interactive Paper and Symposium Demonstration Session where Interactive Paper authors display their posters and are available to answer questions and engage in in-depth discussions about their papers. Light refreshments are provided. Please note that conference registration badges are required for entrance and that posters may be previewed by all attendees beginning Monday/Tuesday 10:00 am to 4:00 pm.

### Symposium Demonstration Session

*Grand Peninsula Ballroom E*

Tuesday 25 January . . . . . 5:30 to 8:00 pm

The highly-successful, interactive, hands-on demonstration of hardware, software, display, and research products related to all the topics covered by the Electronic Imaging Symposium will again take place in conjunction with the Interactive Papers session.

This annual demonstration—which traditionally has showcased the largest and most diverse collection of stereoscopic research and products in one location—represents a unique networking opportunity, a time when attendees can see the latest research in action, compare commercial products, ask questions of technically knowledgeable demonstrators, and even make purchasing decisions about a range of EI products.

## All-Conference Reception

*Grand Peninsula Ballroom A*

Wednesday 26 January. . . . . 7:00 to 9:00 pm

The All-Conference Reception provides a wonderful opportunity to get to know and interact with Electronic Imaging colleagues. Plan to join us for this relaxing and enjoyable event.

## Attend the Photonics West Exhibition in San Francisco

Take advantage of free shuttle service on Thursday 27 January, from the Hyatt Regency San Francisco Airport Hotel to the free 1,200-company Photonics West Exhibition at The Moscone Center in San Francisco. Exhibition and shuttle registration is free. Please preregister to secure shuttle transportation and to have a badge waiting for you at the exhibition.

Register for the free Photonics West Exhibition and sign up for the free shuttle. The shuttle is on a first-come, first-served basis. Time slots will be confirmed based on minimum signups for any given time. Your confirmation will verify the final departure and return times offered.

## Plenary Session and Society Award Presentations

*Grand Peninsula Ballroom A*

Tuesday 25 January . . . . . 8:20 to 9:20 am

**Welcome**. . . . . 8:20 to 8:25 am
**Plenary Presentation**. . . . . 8:25 to 9:10 am
**Society Award Announcements**. . . . . 9:10 to 9:20 am

*Plenary Presentation:*

## New Dimensions in Visual Quality

**Al Bovik,** Lab. for Image and Video Engineering (LIVE), The Univ. of Texas at Austin

*Abstract:* In this talk, I will discuss my personal view of the future of research of automated visual quality assessment algorithms. I will begin by proposing that the Full Reference Image and Video Quality Assessment (FR I/VQA) problems are nearly solved, or at least progress on them has plateaued, with further improvements incremental and requiring more sophisticated perceptual models. As one of the "new dimensions" of QA work, I will discuss a "great unsolved problem" in I/VQA - the general-purpose Blind or No-Reference (NR) I/VQA problem. I will describe our recent efforts on framing and solving this problem. I will also discuss another ongoing "new dimension" of QA research: 3D Stereo I/VQA, or SI/VQA. I will preview our current efforts in the creation of large databases for SI/VQA, including the results of a large-scale human study that we have conducted. I will also describe our efforts on SI/VQA algorithm development. Given current trends in video product commercialization, these new dimensions of QA research are of considerable relevance to emerging technologies and consumer products in the pervasive mobile, Internet, digital TV, and cinematic spaces, amongst many others.

*Biography:* **Al Bovik** is the Curry/Cullen Trust Endowed Chair Professor at The University of Texas at Austin. He is well known for his fundamental work in perceptual image and video processing and modeling of visual perception. Al is particularly noted in recent years for his pioneering work on image and video quality assessment. Al has received a number of major awards from the IEEE Signal Processing Society, including: the Best Paper Award (2009); the Education Award (2007); the Technical Achievement Award (2005), the Distinguished Lecturer Award (2000); and the Meritorious Service Award (1998). He is a Fellow of the IEEE, a Fellow of the Optical Society of America (OSA), and a Fellow of the Society of Photo-Optical and Instrumentation Engineers (SPIE).

## Plenary Session and Conference Award Presentations

*Grand Peninsula Ballroom A*

Wednesday 26 January. . . . . 8:20 to 9:20 am

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**Conference Award Announcements** . . . . . 9:10 to 9:20 am

*Plenary Presentations:*

## Problems in Biological Imaging: Opportunities for Signal Processing

**Jelena Kovacevic,** Department of Biomedical Engineering, Department of Electrical and Computer Engineering Director, Center for Bioimage Informatics Carnegie Mellon University

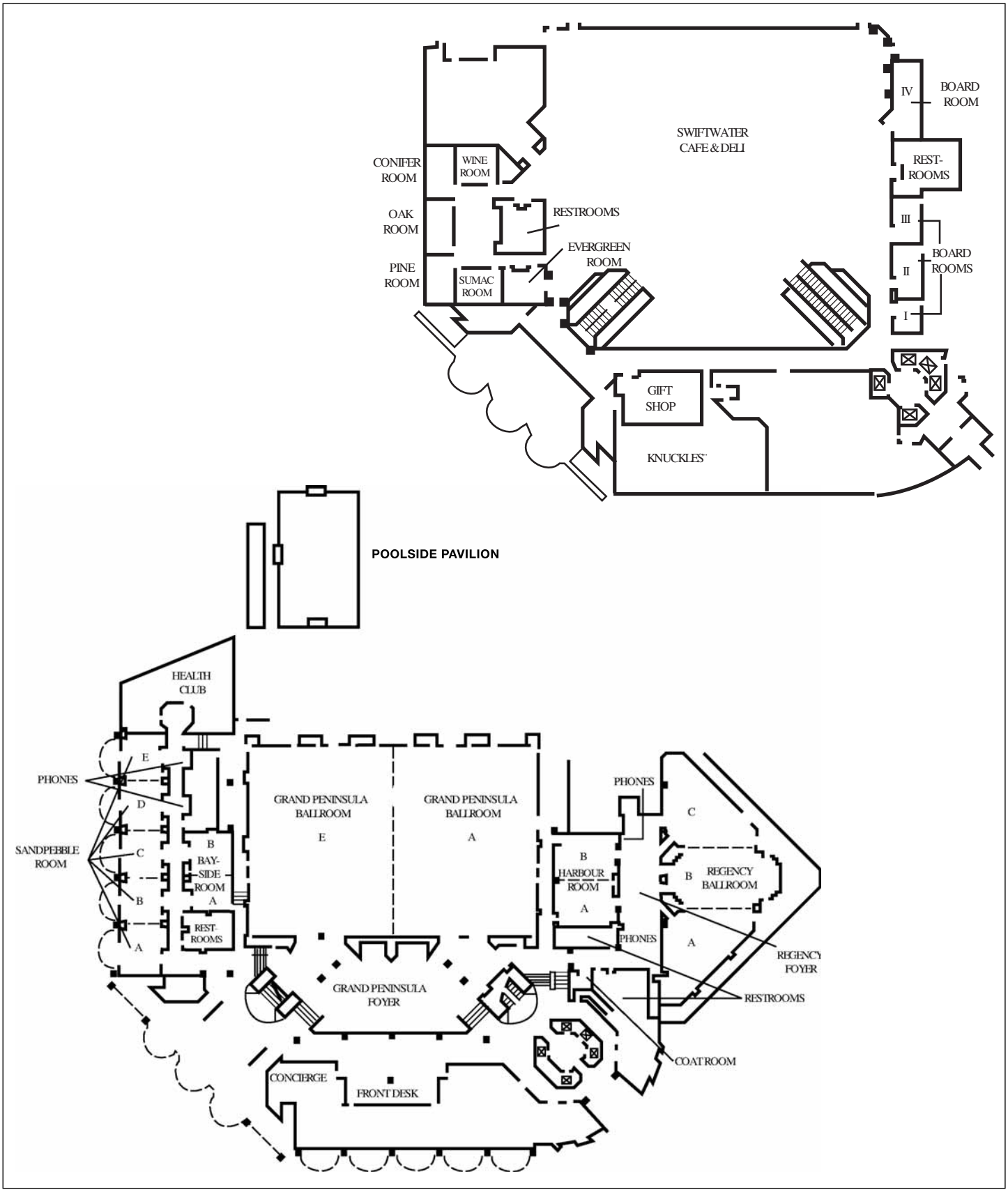
*Abstract:* In recent years, the focus in biological sciences has shifted from understanding single parts of larger systems, sort of vertical approach, to understanding complex systems at the cellular and molecular levels, horizontal approach. Thus the revolution of "omics" projects, genomics and now proteomics. Understanding complexity of biological systems is a task that requires acquisition, analysis and sharing of huge databases, and in particular, high-dimensional databases. Processing such huge amount of bioimages visually by biologists is inefficient, time-consuming and error-prone. Therefore, we would like to move towards automated, efficient and robust processing of such bioimage data sets. Moreover, some information hidden in the images may not be readily visually available. Thus, we do not only help humans by using sophisticated algorithms for faster and more efficient processing but also because new knowledge is generated through use of such algorithms.

The ultimate dream is to have distributed yet integrated large bioimage databases which would allow researchers to upload their data, have it processed, share the data, download data as well as platform-optimized code, etc, and all this in a common format. To achieve this goal, we must draw upon a whole host of sophisticated tools from signal processing, machine learning and scientific computing. I will address some of these issues in this presentation, especially those where signal processing expertise can play a significant role.

*Biography:* **Jelena Kovacevic** received a PhD degree from Columbia University. She then joined Bell Labs, followed by Carnegie Mellon University in 2003, where she is currently a Professor in the Departments of BME and ECE. She received the Belgrade October Prize and the E.I. Jury Award at Columbia University. She is a co-author on an SP Society award-winning paper and is a coauthor of the book "Wavelets and Subband Coding." Dr. Kovacevic is a Fellow of the IEEE and was the Editor-in-Chief of the IEEE Transactions on Image Processing. Her research interests include multiresolution techniques and applications.

# Meeting Room Locations

## Hyatt Regency San Francisco Airport



## Electronic Imaging 2011

Hyatt Regency San Francisco Airport Hotel
1333 Bayshore Hwy. Burlingame, CA 94010

## Short Course Registration and Course Notes

**Course-only registration**

Sunday 23 January . . . . . 7:00 am to 10:00 am

Courses and workshops are priced separately. Course-only registration includes your selected course(s), course notes, coffee breaks, and admittance to the exhibition. Course prices include California state tax.

**Short Courses Notes**

Short courses will take place in various meeting rooms at the Hyatt Regency San Francisco Airport Hotel. Room assignments are noted on the course admission tickets and distributed with registration materials.

## Onsite Registration Hours

*Hyatt Regency San Francisco Airport Hotel, Grand Peninsula Foyer*

Conference and course registration

Sunday 23 January . . . . . 10:00 am to 4:00 pm
Monday 24 January. . . . . 7:00 am to 4:00 pm
Tuesday 25 January . . . . . 7:30 am to 4:00 pm
Wednesday 26 January . . . . . 7:30 am to 4:00 pm
Thursday 27 January . . . . . .7:30 am to noon

Conference registration includes: Access to all symposium conferences, Interactive Paper and Demonstration Sessions, Exhibition, Coffee breaks, All-Conference Reception, and Choice of conference proceedings: Printed or CD-ROM. Short Courses are not automatically included; you can add a course registration with your conference registration.

## Speaker AV Prep Room and Hours

Open during Registration Hours

Each conference room has an LCD projector, screen, lapel microphone, and laser pointer. All presenters are encouraged to visit the Speaker AV Prep Room to confirm that their presentation, whether using a memory device or laptop, is compatible with the audiovisual equipment supplied in the conference rooms.

Speakers who have requested special equipment, prior to the request deadline, are asked to report to the AV Prep Room to confirm their requested equipment is available.

## Interactive Paper Set Up

Authors are asked to set up their poster papers between 8:00 and 10:00 am on Monday. Pushpins are provided; other supplies can be obtained at the Conference Registration Desk. Posters will be on display Monday and Tuesday. Authors must remove poster papers at the conclusion of the Interactive Session; posters not removed are considered unwanted and will be removed by staff and discarded. Neither sponsoring Society assumes responsibility for posters left up before or after the Interactive Paper Session.

## Internet Availability

The Hyatt Regency San Francisco offers wireless Internet services in each guest room for a charge of $9.99 per 24-hour period. There is no free wireless service in public areas.

A computer dedicated to printing out boarding passes, at no charge, is located next to the Concierge Desk in the lobby.

## Business Center

Hyatt Regency San Francisco Airport offers a full service 24-hour business center with the following amenities:

Internet access with printers - 20 minutes @ $5.00

Wireless NIC cards for rent or purchase

Copy services in black and white (Notes: Currently there are no options for color copying) - $.25 per copy ($1.25 minimum)

Color copies are available at the local FedEx Office Print & Ship

Computers available for use - 20 minutes @ $5.00

Facsimile services - no charge

Shipping services and supplies

The business center is located in the lobby of the hotel, adjacent to the registration desk.

## Cashier

IS&T cashier can assist with registration payments, adding a short course, receipts, and badge corrections.

## Message Center

There will be a message board next to the conference registration desk. Attendees are asked to check the board daily for any messages.

## IS&T Bookstore and Membership Booth

Open Sunday through Thursday during registration hours.

IS&T publishes and/or distributes technical materials on a broad range of subjects pertinent to the field of electronic imaging. In addition to titles from leading scientific publishers, IS&T showcases proceedings from its Digital Printing Technologies, Digital Fabrication, Archiving and Color Imaging conferences, as well as selected books on related topics. Information on upcoming meetings and membership, and gratis copies of journals are also available.

## SPIE Bookstore

Open during registration hours.

The SPIE Bookstore is your source for the latest SPIE Press books, Proceedings and educational and professional development materials.

## Child Care Services

American Childcare is the preferred babysitting services for the hotel. They are accredited. Phone: 415-285-2300.

IS&T/SPIE do not imply an endorsement or recommendation of these services. They are provided on an “information only” basis for your further analysis and decision. Other services may be available.

IS&T / SPIE

# Electronic Imaging

## SCIENCE AND TECHNOLOGY

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**Bernice E. Rogowitz,** Visual Perspectives Consulting (United States)

**Juha Röning,** Univ. of Oulu (Finland)

**Amir Said,** Hewlett-Packard Labs. (United States)

**Nicu Sebe,** Univ. degli Studi di Trento (Italy)

**Cees G. M. Snoek,** Univ. van Amsterdam (Netherlands)

**Robert L. Stevenson,** Univ. of Notre Dame (United States)

**David G. Stork,** Ricoh Innovations, Inc. (United States)

**Christian Viard-Gaudin,** Univ. of Nantes (France)

**Ralf Widenhorn,** Portland State Univ. (United States)

**Patrick J. Wolfe,** Harvard Univ. (United States)

**Pak Chung Wong,** Pacific Northwest National Lab. (United States)

**Andrew J. Woods,** Curtin Univ. (Australia)

**Feng Xiao,** Fairchild Imaging (United States)

**Yu-Jin Zhang,** Tsinghua Univ. (China)

SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY

## 3D Imaging, Interaction, and Measurement

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## Visual Information Processing and Communication

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# Course Daily Schedule

| SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY |
|---|---|---|---|---|
| **3D Imaging, Interaction, and Measurement** | | | | |
| SC060 **Stereoscopic Display Application Issues** *(Merritt, Woods)* 8:30 am to 5:30 pm, $530 / $630 | | SC927 **3D Imaging** *(Agam)* 8:30 am to 12:30 pm, $325 / $375 | | |
| SC1029 **DLP Projection Technology** *(Ramanath)* 8:30 am to 12:30 pm, $325 / $375 | | | | |
| **Digital Imaging Sensors and Applications** | | | | |
| SC762 **Device Simulation for Image Quality Evaluation** *(Farrell, Catrysse, Wandell)* 8:30 am to 5:30 pm,$530 / $630 | SC504 **Introduction to CCD and CMOS Imaging Sensors and Applications** *(Janesick)* 8:30 am to 5:30 pm, $670 / $770 | SC916 **Digital Camera and Sensor Evaluation Using Photon Transfer** *(Janesick)* 8:30 am to 5:30 pm, $580 / $680 | SC807 **Digital Camera and Scanner Performance Evaluation: Science, Standards and Software** *(Burns, Williams)* 8:30 am to 5:30 pm, $530 / $630 | |
| SC1016 **Introduction to High Dynamic Range Imaging** *(Darmont)* 8:30 am to 12:30 pm, $325 / $375 | | | SC980 **Theory and Methods of Lightfield Photography** *(Georgiev, Lumsdaine)* 1:30 to 5:30 pm, $325 / $375 | |
| SC1021 **Mobile Computational Photography** *(Pulli, Ahonen, Gelfand, Tico)* 8:30 am to 5:30 pm, $530 / $630 | | | | |
| SC878 **Processing Pipeline for Color Imaging** *(Theuwissen)* 8:30 am to 5:30 pm, $530 / $630 | | | | |
| SC1022 **Biometrics - Introduction to Automated Human Recognition** *(Wayman)* 1:30 to 5:30 pm, $325 / $375 | | | | |
| SC967 **High Dynamic Range Imaging: Sensors and Architectures** *(Darmont)* 1:30 to 5:30 pm, $325 / $375 | | | | |
| SC871 **Noise, Image Processing, and their Influence on Resolution** *(Matherson, Wüller)* 1:30 to 5:30 pm, $325 / $375 | | | | |
| SC1027 **Smart Cameras and Visual Sensor Networks** *(Rinner)* 1:30 to 5:30 pm, $325 / $375 | | | | |
| **Image Processing** | | | | |
| SC965 **Joint Design of Optics and Image Processing for Imaging Systems** *(Stork)* 8:30 am to 12:30 pm, $325 / $375 | SC468 **Image Enhancement, Deblurring and Super-Resolution** *(Rabbani)* 8:30 am to 5:30 pm, $530 / $630 | | SC807 **Digital Camera and Scanner Performance Evaluation: Science, Standards and Software** *(Burns)* 8:30 am to 5:30 pm, $530 / $630 | |
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| SC762 **Device Simulation for Image Quality Evaluation** *(Farrell, Catrysse, Wandell)* 8:30 am to 5:30 pm, $530 / $630 | | | | |
| SC1015 **Understanding and Interpreting Images** *(Rabbani)* 8:30 am to 12:30 pm, $325 / $375 | | | | |
| SC1029 **DLP Projection Technology** *(Ramanath)* 8:30 am to 12:30 pm, $325 / $375 | | | | |

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| SC969 **Perception, Cognition, and Next Generation Imaging** *(Rogowitz)* 8:30 am to 12:30 pm, $325 / $375 | | | | |
| SC060 **Stereoscopic Display Application Issues** *(Merritt, Woods)* 8:30 am to 5:30 pm, $530 / $630 | | | | |
| SC1015 **Understanding and Interpreting Images** *(Rabbani)* 8:30 am to 12:30 pm, $325 / $375 | | | | |
| SC871 **Noise, Image Processing, and their Influence on Resolution** *(Matherson, Wüller)* 1:30 to 5:30 pm, $325 / $375 | | | | |
| SC1029 **DLP Projection Technology** *(Ramanath)* 8:30 am to 12:30 pm, $325 / $375 | | | | |
| SC1023 **Modern Data Visualization** (Grinstein) 1:30 to 5:30 pm, $325 / $275 | | | | |

## Multimedia Processing and Applications

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| SC1015 **Understanding and Interpreting Images** *(Rabbani)* 8:30 am to 12:30 pm, $325 / $375 | | | | |

**Register for Courses at the cashier desk.**

Monday-Thursday 24-27 January 2011 • Proceedings of SPIE Vol. 7863

# Stereoscopic Displays and Applications XXII

*Conference Chairs:* **Andrew J. Woods,** Curtin Univ. (Australia); **Nicolas S. Holliman,** Durham Univ. (United Kingdom); **Neil A. Dodgson,** Univ. of Cambridge (United Kingdom)

*Founding Chair:* **John O. Merritt,** the Merritt Group

*Program Committee:* **Gregg E. Favalora,** Optics for Hire; **Hideki Kakeya,** Univ. of Tsukuba (Japan); **Takashi Kawai,** Waseda Univ. (Japan); **Janusz Konrad,** Boston Univ.; **Vivian K. Walworth,** StereoJet, Inc.; **Chris Ward,** Lightspeed Design, Inc.; **Michael A. Weissman,** TrueVision Systems; **Samuel Z. Zhou,** IMAX Corp. (Canada)

*Cosponsored by* IMAX®

## Monday 24 January

### SESSION 1

**Grand Peninsula Ballroom A . . . . . Mon. 8:30 to 10:10 am**

#### Visual Comfort and Quality

*Session Chair*: **John O. Merritt,** The Merritt Group

8:30 am: **Adapting stereoscopic movies to the viewing conditions using depth-preserving and artifact-free novel view synthesis**, Frederic Devernay, Sylvain Duchêne, Adrian Ramos-Peon, INRIA Rhône-Alpes (France) . . . . . .[7863-01]

8:50 am: **Visual fatigue monitoring system based on eye-movement and eye-blink detection**, Donghyun Kim, Sunghwan Choi, Jaeseob Choi, Kwanghoon Sohn, Yonsei Univ. (Korea, Republic of) . . . . . .[7863-02]

9:10 am: **Factors impacting quality of experience in stereoscopic images**, Liyuan Xing, Junyong You, Norwegian Univ. of Science and Technology (Norway); Touradj Ebrahimi, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Andrew Perkis, Norwegian Univ. of Science and Technology (Norway). . . . . .[7863-03]

9:30 am: **Visual discomfort induced by fast salient object motion in stereoscopic video**, Seong-il Lee, Korea Advanced Institute of Science and Technology (Korea, Republic of); Yong Ju Jung, Samsung Advanced Institute of Technology (Korea, Republic of); Hosik Sohn, Yong Man Ro, Hyun Wook Park, Korea Advanced Institute of Science and Technology (Korea, Republic of). . . . . .[7863-04]

9:50 am: **3D video disparity adjustment for preference and prevention of discomfort,** Hao Pan, Chang Yuan, Scott J. Daly, Sharp Labs. of America, Inc. (United States). . . . . .[7863-05]

**Official SD&A Welcome . . . . . Mon. 10:10 to 10:20 am**

Coffee Break . . . . . .10:20 to 10:50 am

### SESSION 2

**Grand Peninsula Ballroom A . . . . . Mon. 10:50 to 11:30 am**

#### Combining Depth Cues

*Session Chair*: **Vivian K. Walworth,** StereoJet, Inc.

10:50 am: **Can the depth perception of stereoscopic images be influenced by 3D sound?**, Amy Turner, Nicolas S. Holliman, Durham Univ. (United Kingdom). . . . . .[7863-06]

11:10 am: **Evaluating motion parallax and stereopsis as depth cues for autostereoscopic displays,** Ulrich Leiner, Fraunhofer-Institut für Nachrichtentechnik Heinrich-Hertz-Institut (Germany); Marius Braun, Fachochschule für Technik und Wirtschaft Berlin (Germany) . . . .[7863-07]

**Grand Peninsula Ballroom A . . . . . Mon. 11:30 am**

#### Keynote Presentation I

The SD&A Keynote Presentation provides an opportunity to hear an eminent speaker discuss a topic of interest to the global stereoscopic community.

Final details of this exciting event were not available at the time this program went to print. Please check the sign board outside the SD&A conference room, or the conference website for final details.

Lunch Break . . . . . 12:30 to 2:00 pm

### SESSION 4

**Grand Peninsula Ballroom A . . . . . Mon. 2:00 to 3:20 pm**

#### View Synthesis

*Session Chair*: **Nicolas S. Holliman,** Durham Univ. (United Kingdom)

2:00 pm: **A multi-resolution multi-size windows disparity estimation approach**, Judit Martinez Bauza, Qualcomm Inc. (United States); Manish P. Shiralkar, Clemson Univ. (United States) . . . . . .[7863-09]

2:20 pm: **Warping error analysis and reduction for depth image based rendering in 3DTV**, Luat Do, Svitlana Zinger, Technische Univ. Eindhoven (Netherlands); Peter H. N. de With, CycloMedia Technology B.V. (Netherlands) . . . . . .[7863-10]

2:40 pm: **Novel view synthesis for dynamic scene using moving multi-camera array**, Takanori Yokoi, Nagoya Univ. (Japan); Norishige Fukushima, Nagoya Institute of Technology (Japan); Tomohiro Yendo, Mehrdad Panahpour Tehrani, Nagoya Univ. (Japan); Toshiaki Fujii, Tokyo Institute of Technology (Japan); Masayuki Tanimoto, Nagoya Univ. (Japan). . . . . .[7863-11]

3:00 pm: **Depth-based representations: which coding format for 3D video broadcast applications?**, Paul Kerbiriou, Guillaume Boisson, Korian Sidibe, Technicolor R&D France (France); Quan Huynh-Thu, Technicolor S.A. (France) . . . . . .[7863-12]

Coffee Break . . . . . 3:20 to 3:50 pm

### SESSION 5

**Grand Peninsula Ballroom A . . . . . Mon. 3:50 to 5:10 pm**

#### Multiview Systems

*Session Chair*: **Neil A. Dodgson,** Univ. of Cambridge (United Kingdom)

3:50 pm: **Multiview image compression based on a new basis representation**, Takehiro Yamada, Toshiaki Fujii, Tokyo Institute of Technology (Japan) . . . . . .[7863-13]

4:10 pm: **Design of tuneable anti-aliasing filters for multiview displays**, Atanas R. Boev, Robert Bregovic, Atanas P. Gotchev, Tampere Univ. of Technology (Finland) . . . . . .[7863-14]

4:30 pm: **Multiview image compression based on LDV scheme**, Benjamin Battin, Cédric Niquin, Philippe Vautrot, Univ. de Reims Champagne-Ardenne (France); Didier G. Debons, 3DTV Solutions (France); Laurent Lucas, Univ. de Reims Champagne-Ardenne (France) . .[7863-15]

4:50 pm: **Upsampling range camera depth maps using high-resolution vision camera and pixel-level confidence classification**, Chao Tian, Vinay A. Vaishampayan, AT&T Labs. Research (United States); Yifu Zhang, Texas A&M Univ. (United States) . . . . . .[7863-16]

Short Break . . . . . 5:10 to 5:30 pm

**Grand Peninsula Ballroom A . . . . . .Mon. 5:30 to 7:30 pm**

### 3D Theatre

Session Chairs: Andrew J. Woods, Curtin Univ. (Australia); Chris Ward, Lightspeed Design, Inc.This ever-popular session allows attendees to see large-screen examples of 3D content from around the world. Program announced at the conference. 3D glasses provided.

**SD&A Annual Dinner . . . . . .Mon. 8:00 to late**

The annual informal dinner for SD&A attendees. An opportunity to meet with colleagues and discuss the latest advances. There is no host for the dinner. Information on venue and cost will be provided on the day at the conference.

## Tuesday 25 January

**Grand Peninsula Ballroom A. . . . . Tues. 8:20 to 9:20 am**

### Plenary Session and Society Award Presentations

8:25 am: **New Dimensions in Visual Quality**, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

## SESSION 6

**Grand Peninsula Ballroom A . . . . . Tues. 9:30 to 10:30 am**

### Applications of Stereoscopic Displays

*Session Chair*: **Chris Ward,** Lightspeed Design, Inc.

9:30 am: **Attack of the s. mutans! A stereoscopic-3D multi-player direct-manipulation behavior-modification serious game for improving oral health in pre-teens**, Ari Hollander, Firsthand Technology Inc. (United States) . . . . . .[7863-17]

9:50 am: **Stereoscopic multi-perspective capture and display in the performing art**, Volker Kuchelmeister, The Univ. of New South Wales (Australia). . . . . .[7863-18]

10:10 am: **Machine vision and vitrectomy: three-dimensional high definition video for surgical visualization in vitreoretinal surgery**, Christopher D. Riemann M.D., Cincinnati Eye Institute and MedNet Technologies, Inc. (United States). . . . . .[7863-19]

Coffee Break . . . . . .10:30 to 11:10 am

## SESSION 7

**Grand Peninsula Ballroom A . . . . . .Tues. 11:10 am to 12:30 pm**

### Stereoscopic Display Developments

*Session Chair*: **Michael A. Weissman,** TrueVision Systems

11:10 am: **High image quality 3D displays with polarizer glasses based on active retarder technology**, Sung-Min Jung, Young-Bok Lee, Hyung-Ju Park, Jin-Woo Park, Dong-Hoon Lee, Woo-Nam Jeong, Jeong-Hyun Kim, In-Jae Chung, LG Display (Korea, Republic of) . . . . . .[7863-20]

11:30 am: **High brightness film projection system for stereoscopic movies**, Lenny Lipton, Oculus3D (United States). . . . . .[7863-21]

11:50 am: **New generation of universal active glasses**, Bernard Mendiburu, Volfoni (United States); Bertrand Caillaud, Gilles Jovene, Thierry Henkinet, Volfoni (France) . . . . . .[7863-22]

12:10 pm: **Continuously adjustable Pulfrich spectacles**, Kenneth M. Jacobs, Binghamton Univ. (United States); Ronald S. Karpf, ADDIS Inc. (United States). . . . . .[7863-23]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 8

**Grand Peninsula Ballroom A . . . . . Tues. 2:00 to 2:40 pm**

### Evaluating the Quality of the Stereoscopic Experience I: Joint Session with Conference 7865

*Session Chairs*: **Andrew J. Woods,** Curtin Univ. (Australia); **Christopher W. Tyler,** The Smith-Kettlewell Eye Research Institute

2:00 pm: **Visual discomfort with stereo displays: effects of viewing distance and direction of vergence-accommodation conflict**, Takashi Shibata, Univ. of California, Berkeley (United States) and Waseda Univ. (Japan); Joohwan Kim, David M. Hoffman, Martin S. Banks, Univ. of California, Berkeley (United States). . . . . .[7863-24]

2:20 pm: **Effects of 3D display on accommodative and vergent responses and subsequent visual discomfort and motion sickness,** Shunnan Yang, Pacific Univ. (United States) . . . . . .[7863-66]

**Regency Ballroom B. . . . . .Tues. 2:40 to 3:30 pm**

### Discussion Forum I: 3DTV Dangers: Truth or Fiction?

There has been a lot of recent discussion in the media about the potential dangers of 3DTVs and 3D Movies - and yet stereoscopes have been with us for over 150 years, 3D movies for over 50 years, and 3D viewing is also widely used in industry. 3DTV is, however, transitioning from a special event to a 24/7 experience and becoming available to a wider demographic. Where is the truth in the concerns being expressed, where are the falsehoods, and where are the gaps in our knowledge? The panelists will give their views on this important topic.

*Panel Moderator:*

**Lenny Lipton,** CTO, Oculus 3D

*Panel Members:*

**Marty Banks,** Univ. of California Berkeley

**Christopher Tyler,** Smith Kettlewell Eye Research Institute

**Christopher Riemann,** MD, Cincinnati Eye Institute

**Pete Ludé,** Senior Vice President, Engineering, Sony Electronics

Coffee Break . . . . . 3:30 to 4:00 pm

## SESSION 9

**Grand Peninsula Ballroom A . . . . . Tues. 4:00 to 5:20 pm**

### Evaluating the Quality of the Stereoscopic Experience II: Joint Session with Conference 7865

*Session Chairs*: **Christopher W. Tyler,** The Smith-Kettlewell Eye Research Institute; **Andrew J. Woods,** Curtin Univ. (Australia)

4:00 pm: **Effect of image scaling on stereoscopic movie experience**, Jukka P. Häkkinen, Jussi Hakala, Aalto Univ. School of Science and Technology (Finland); Miska Hannuksela, Nokia Research Ctr. (Finland); Pirkko Oittinen, Aalto Univ. School of Science and Technology (Finland). . . . . .[7863-25]

4:20 pm: **Examination of 3D visual attention in stereoscopic video content**, Quan Huynh-Thu, Luca Schiatti, Technicolor (France) .[7865-20]

4:40 pm: **Relationship between perception of image resolution and peripheral visual field in stereoscopic images**, Masahiko Ogawa, Kazunori Shidoji, Kyushu Univ. (Japan). . . . . .[7863-26]

5:00 pm: **Quantifying how the combination of blur and disparity affects the perceived depth,** Junle Wang, Marcus Barkowsky, Vincent Ricordel, Patrick Le Callet, Univ. de Nantes (France). . . . . .[7865-21]

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

## Interactive Paper and Symposium Demonstration Session

*Session Chairs*: **Neil A. Dodgson,** Univ. of Cambridge (United Kingdom); **Andrew J. Woods,** Curtin Univ. (Australia)

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging. There will be a special focus area of the demonstration dedicated to Stereoscopic Displays and Applications.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Human perception considerations for 3D content creation**, Almont Green, Almont Green Studios (United States). . . . . .[7863-49]

**System crosstalk issues on autostereoscopic displays**, Pei-Chia Wang, Sheue-Ling Hwang, Hsin-Ying Huang, Chih-Fei Chuang, National Tsing Hua Univ. (Taiwan). . . . . .[7863-50]

**Automatic 3D video format detection**, Tao Zhang, Zhe Wang, Jiefu Zhai, Technicolor (United States); Didier Doyen, Technicolor S.A. (France) . . . . . .[7863-51]

**Low-complexity 2D to 3D video conversion**, Ying Chen, Rong Zhang, Marta Karczewicz, Qualcomm Inc. (United States). . . . . .[7863-52]

**Development of a modular stereoscopic pre-visualisation and display framework**, Volker Kuchelmeister, The Univ. of New South Wales (Australia). . . . . .[7863-53]

**Color appearance in stereoscopy**, Davide Gadia, Alessandro Rizzi, Cristian Bonanomi, Daniele Marini, Univ. degli Studi di Milano (Italy); Alessandra Galmonte, Univ. degli Studi di Verona (Italy); Tiziano Agostini, Univ. degli Studi di Trieste (Italy) . . . . . .[7863-54]

**Coarse integral volumetric imaging with flat screen and wide viewing angle**, Shimpei Sawada, Atsuo Nakao, Hiroaki Kodaira, Hideki Kakeya, Univ. of Tsukuba (Japan). . . . . .[7863-55]

**Coarse integral imaging without pseudo image**, Tomoya Kurokawa, Hideki Kakeya, Univ. of Tsukuba (Japan) . . . . . .[7863-56]

**Free-viewpoint image generation from a video captured by a handheld camera**, Kota Takeuchi, Nagoya Univ. (Japan); Norishige Fukushima, Nagoya Institute of Technology (Japan); Tomohiro Yendo, Mehrdad Panahpour Tehrani, Nagoya Univ. (Japan); Toshiaki Fujii, Tokyo Institute of Technology (Japan); Masayuki Tanimoto, Nagoya Univ. (Japan) .[7863-57]

**New stereoscopic video shooting rule based on stereoscopic distortion parameters and comfortable viewing zone**, Wei Chen, Jérôme Fournier, France Telecom (France); Marcus Barkowsky, Patrick Le Callet, Univ. de Nantes (France) . . . . . .[7863-58]

**Reduced-view super multi-view display**, Junya Nakamura, Kosuke Tanaka, Tokyo Univ. of Agriculture and Technology (Japan); Chao-Hsu Tsai, Industrial Technology Research Institute (Taiwan); Yasuhiro Takaki, Tokyo Univ. of Agriculture and Technology (Japan) . . . . . .[7863-59]

**Psycho-physiological effects of visual artifacts by stereoscopic display systems**, Sanghyun Kim, Junki Yoshitake, Hiroyuki Morikawa, Takashi Kawai, Osamu Yamada, Akihiko Iguchi, Waseda Univ. (Japan). . . . . .[7863-60]

**2D viewing experience with fixed 3D displays**, Marja Salmimaa, Toni Jarvenpaa, Monika Polonen, Nokia Research Ctr. (Finland). . . . .[7863-62]

**Interestingness of stereoscopic images**, Jussi Hakala, Mikko Nuutinen, Pirkko Oittinen, Aalto Univ. School of Science and Technology (Finland). . . . . .[7863-63]

**Subjective evaluation of HDTV stereoscopic videos in IPTV scenarios using absolute category rating**, Kun Wang, Acreo AB (Sweden); Marcus Barkowsky, Romain Cousseau, Univ. de Nantes (France); Kjell E. Brunnström, Acreo AB (Sweden); Roger Olsson, Mid Sweden Univ. (Sweden); Patrick Le Callet, Univ. de Nantes (France); Mårten Sjöström, Mid Sweden Univ. (Sweden) . . . . . .[7863-64]

**Improved depth map estimation in stereo vision**, Hajer Fradi, Jean-Luc E. Dugelay, EURECOM (France) . . . . . .[7863-65]

**Is visual fatigue changing the perceived depth accuracy on an autostereoscopic display?**, Marcus Barkowsky, Romain Cousseau, Patrick Le Callet, Univ. de Nantes (France). . . . . .[7863-67]

**Interlaced MVD format for free viewpoint video**, Seok Lee, Seungsin Lee, Jaejoon Lee, Ho-Cheon Wey, Dusik Park, Chang-Yeong Kim, Samsung Advanced Institute of Technology (Korea, Republic of)[7863-68]

**Visual discomfort prediction for stereo contents**, Shan He, Tao Zhang, Technicolor (United States). . . . . .[7863-69]

**Three-dimensional holographic display using active shutter for head mounted display application**, Hyun-Eui Kim, Jae-Hyeung Park, Chungbuk National Univ. (Korea, Republic of) . . . . . .[7863-70]

**Pixel-offset position detection using lens array for integral three-dimensional display**, Hisayuki Sasaki, NHK Science & Technical Research Labs. (Japan); Masahiro Kawakita, National Institute of Information and Communications Technology (Japan) and NHK Science & Technical Research Labs. (Japan); Kenichiro Masaoka, Jun Arai, Makoto Okui, Fumio Okano, NHK Science & Technical Research Labs. (Japan); Yasuyuki Haino, Makoto Yoshimura, Masahito Sato, JVC KENWOOD Holdings, Inc. (Japan). . . . . .[7863-71]

**3D imaging for glasses free multi-view 3D displays**, Sabri Gurbuz, Masahiro Kawakita, National Institute of Information and Communications Technology (Japan); Sumio Yano, NHK Science & Technical Research Labs. (Japan); Shoichiro Iwasawa, Hiroshi Ando, National Institute of Information and Communications Technology (Japan). . . . . .[7863-72]

**Reduction of image blurring in an autostereoscopic multilayer liquid crystal display**, Hironobu Gotoda, National Institute of Informatics (Japan). . . . . .[7863-73]

**A new volmetric 3D display using multi-varifocal lens and high-speed 2D display**, Takanori Sonoda, Hirotsugu Yamamoto, Shiro Suyama, Univ. of Tokushima (Japan) . . . . . .[7863-74]

**A novel super-multi-view display containing 7.680 perspective views**, Armin Grasnick, Sunny Ocean Studios Pte. Ltd. (Singapore). . . .[7863-75]

**Use of camera drive in stereoscopic display of learning contents of introductory physics**, Shu Matsuura, Tokyo Gakugei Univ. (Japan). . . . . .[7863-76]

**Producing content for 3D home theater**, James J. Karns, XD Images (United States). . . . . .[7863-77]

**DWT-based stereoscopic image watermarking**, Mihai P. Mitrea, Afef Chammem, Françoise J. Prêteux, TELECOM & Management SudParis (France) . . . . . .[7863-78]

**Development of a new HD multi-view camera and processing system**, Changseob Park, Jun-Yong Lee, Jin-mo Kang, Korean Broadcasting System (Korea, Republic of); Keunsik Lee, Korean Broadcasting System (United States). . . . . .[7863-79]

**multi-view video codec based on KTA techniques**, Jungdong Seo, Kwanghoon Sohn, Yonsei Univ. (Korea, Republic of) . . . . . .[7863-80]

**On-screen-display (OSD) menu detection for proper stereo content reproduction for 3D TV**, Ekaterina V. Tolstaya, Victor V. Bucha, Michael Rychagov, Samsung Electronics Co., Ltd. (Russian Federation) .[7863-81]

**Real-time ray-space transfer of cylindrical objective space**, Tomohiro Yendo, Nagoya Univ. (Japan); Toshiaki Fujii, Tokyo Institute of Technology (Japan); Mehrdad Panahpour Tehrani, Masayuki Tanimoto, Nagoya Univ. (Japan). . . . . .[7863-82]

**Analysis of scene distortions in stereoscopic images due to the variation of the ideal viewing conditions**, Alberto Viale, Dario Villa, Daniele Marini, Univ. degli Studi di Milano (Italy) . . . . . .[7863-83]

**Analysis of resolution limitation of glasses-free 3D tabletop display**, Daniel Moldovan, Shunsuke Yoshida, Masahiro Kawakita, Hiroshi Ando, National Institute of Information and Communications Technology (Japan). . . . . .[7863-84]

**Image quality of up-converted 2D video from frame-compatible 3D video**, Filippo Speranza, Wa James Tam, Carlos A. Vázquez, André Vincent, Ronald Renaud, Robert Klepko, Communications Research Ctr. Canada (Canada). . . . . .[7863-85]

**System crosstalk measurement of a time-sequential 3D display using ideal shutter glasses**, Fu Hao Chen, Kuo-Chung Huang, Lang-Chin D. Lin, Chou-Lin Wu, Kuen Lee, Industrial Technology Research Institute (Taiwan) . . . . . .[7863-86]

**Guidance for horizontal image translation (HIT) on high definition stereoscopic video production**, David K. Broberg, Cable Television Labs., Inc. (United States) . . . . . .[7863-87]

## Wednesday 26 January

**Grand Peninsula Ballroom A . . . . . .Wed. 8:20 to 9:20 am**

### Plenary Session and Conference Award Presentations

8:25 am: **Problems in Biological Imaging: Opportunities for Signal Processing**, Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[EI11SE-102]

## SESSION 10

**Grand Peninsula Ballroom A . . . . . Wed. 9:30 to 10:30 am**

### Autostereoscopic Displays I

*Session Chair*: **Gregg E. Favalora,** Optics for Hire

9:30 am: **Implementation of autostereoscopic HD projection display with dense horizontal parallax**, Shoichiro Iwasawa, Masahiro Kawakita, National Institute of Information and Communications Technology (Japan); Sumio Yano, NHK Science & Technical Research Labs. (Japan); Hiroshi Ando, National Institute of Information and Communications Technology (Japan). . . . . .[7863-27]

9:50 am: **Full-parallax 360 degrees horizontal viewing integral imaging using anamorphic optics**, Munkh-Uchral Erdenebat, Ganbat Baasantseren, Jae-Hyeung Park, Nam Kim, Ki-Chul Kwon, Chungbuk National Univ. (Korea, Republic of) . . . . . .[7863-28]

10:10 am: **Optical characterization of autostereoscopic 3D displays**, Michael J. Sykora, 3M Co. (United States) . . . . . .[7863-29]

Coffee Break . . . . . .10:30 to 11:00 am

## SESSION 11

**Grand Peninsula Ballroom A . . . . . Wed. 11:00 to 11:40 am**

### Autostereoscopic Displays II

*Session Chair*: **Vivian K. Walworth,** StereoJet, Inc.

11:00 am: **Depth cube display using depth map**, Byoung-Sub Song, Sung-Wook Min, Jung-Hun Jung, Kyung Hee Univ. (Korea, Republic of) . . . . . .[7863-30]

11:20 am: **Surface representation of 3D objects for aerial 3D display,** Hiroyo Ishikawa, Hayato Watanabe, Satoshi Aoki, Hideo Saito, Keio Univ. (Japan); Satoru Shimada, Masayuki Kakehata, Yuji Tsukada, National Institute of Advanced Industrial Science and Technology (Japan); Hidei Kimura, Aerial Systems Inc. (Japan) and Burton Inc. (Japan) . . . .[7863-31]

**Grand Peninsula Ballroom A . . . . . .Wed. 11:40 am to 12:40 pm**

### Keynote Presentation II

*Abstract:* We have explored how light propagates from thin elements into a volume for viewing for both automultiscopic displays and holograms. In particular, devices that are typically connected with geometric optics, like parallax barriers, differ in treatment from those that obey physical optics, like holograms. However, the two concepts are often used to achieve the same effect of capturing or displaying a combination of spatial and angular information. Our work connects the two approaches under a general framework based in ray space, from which insights into applications and limitations of both parallax-based and holography-based systems are observed.

Both parallax barrier systems and the practical holographic displays are limited in that they only provide horizontal parallax. Mathematically, this is equivalent to saying that they can always be expressed as a rank-1 matrix (i.e, a matrix in which all the columns are linearly related). Knowledge of this mathematical limitation has helped us to explore the space of possibilities and extend the capabilities of current display types. In particular, we have designed a display that uses two LCD panels, and an optimisation algorithm, to produce a content-adaptive automultiscopic display (SIGGRAPH Asia 2010).

In other work we have developed a 6D optical system that responds to changes in viewpoint as well as changes in surrounding light. Our lenticular array alignment allows us to achieve such a system as a passive setup, omitting the need for electrical components. Unlike traditional 2D flat displays, our 6D displays discretize the incident light field and modulate 2D patterns in order to produce super-realistic (2D) images. By casting light at variable intensities and angles onto our 6D displays, we can produce multiple images as well as store greater information capacity on a single 2D film (SIGGRAPH 2008).

(Joint work with R Horstmeyer, Se Baek Oh, George Barbastathis, Doug Lanman, Matt Hirsch and Yunhee Kim)

*Biography:* **Ramesh Raskar** joined the Media Lab from Mitsubishi Electric Research Laboratories in 2008 as head of the Lab's Camera Culture research group. His research interests span the fields of computational photography, inverse problems in imaging and human-computer interaction. Recent inventions include transient imaging to look around a corner , next generation CAT-Scan machine, imperceptible markers for motion capture (Prakash), long distance barcodes (Bokode), touch+hover 3D interaction displays (BiDi screen), low-cost eye care devices (Netra) and new theoretical models to augment light fields (ALF) to represent wave phenomena.

In 2004, Raskar received the TR100 Award from Technology Review, which recognizes top young innovators under the age of 35, and in 2003, the Global Indus Technovator Award, instituted at MIT to recognize the top 20 Indian technology innovators worldwide. In 2009, he was awarded a Sloan Research Fellowship. In 2010, he received the Darpa Young Faculty award. He holds 42 US patents and has received four Mitsubishi Electric Invention Awards. He is currently co-authoring a book on Computational Photography.

Lunch Break . . . . . 12:40 to 2:00 pm

## SESSION 13

**Grand Peninsula Ballroom A . . . . . Wed. 2:00 to 3:40 pm**

### Crosstalk in Stereoscopic Displays

*Session Chair*: **Takashi Kawai,** Waseda Univ. (Japan)

2:00 pm: **How are crosstalk and ghosting defined in the stereoscopic literature?**, Andrew J. Woods, Curtin Univ. of Technology (Australia) . . . . . .[7863-33]

2:20 pm: **A simple method for measuring crosstalk in stereoscopic displays**, Michael A. Weissman, TrueVision Systems (United States); Andrew J. Woods, Curtin Univ. of Technology (Australia) . . . . . .[7863-34]

2:40 pm: **Ergonomic evaluation of crosstalk in stereoscopy through heart activity and forehead blood flow**, Satoshi Toyosawa, Hiroyuki Morikawa, Kouichi Nakano, Takashi Kawai, Waseda Univ. (Japan); Chin-Sen Chen, Hung-Lu Chang, Jinn-Cherng Yang, Industrial Technology Research Institute (Taiwan) . . . . . .[7863-35]

3:00 pm: **Optical characterization of shutter glasses stereoscopic 3D displays**, Pierre M. Boher, Thierry R. Leroux, Veronique Collomb-Patton, ELDIM (France) . . . . . .[7863-36]

3:20 pm: **The effect of crosstalk on depth magnitude in thin structures**, Inna Tsirlin, Robert S. Allison, Laurie M. Wilcox, York Univ. (Canada) . . . . . .[7863-37]

Coffee Break . . . . . 3:40 to 4:00 pm

## SESSION 14

**Grand Peninsula Ballroom A . . . . . Wed. 4:00 to 5:20 pm**

### 3D Perception and Interaction

*Session Chair*: **Hideki Kakeya,** Univ. of Tsukuba (Japan)

4:00 pm: **Effects of stereoscopic presentation on visually induced motion sickness**, Hiroyasu Ujike, Hiroshi Watanabe, National Institute of Advanced Industrial Science and Technology (Japan) . . . . . .[7863-38]

4:20 pm: **Vergence and accommodation to multiple-image-plane stereoscopic displays: 'Real world' responses with practical image-plane separations?**, Kevin J. MacKenzie, Ruth Dickson, Simon J. Watt, Bangor Univ. (United Kingdom). . . . . .[7863-39]

4:40 pm: **Both efficiency measures and perceived workload sensitive for manipulations in binocular disparity**, Maurice van Beurden, Wijnand Ijsselsteijn, Technische Univ. Eindhoven (Netherlands) . . . . . .[7863-40]

5:00 pm: **Comparison of relative (mouse-like) and absolute (tablet-like) interaction with a large stereoscopic work-space,** Melinos Averkiou, Neil A. Dodgson, Univ. of Cambridge (United Kingdom) . . . . . .[7863-41]

**Grand Peninsula Ballroom A . . . . Wed. 7:00 to 9:00 pm**

**All-Conference Reception**

The annual Electronic Imaging All-Conference Reception provides a wonderful opportunity to get to know and interact with new and old SD&A colleagues. Plan to join us for this relaxing and enjoyable event.

# Thursday 27 January

## SESSION 15

**Grand Peninsula Ballroom A . . . . . Thurs. 8:30 to 9:10 am**

### 3D Content

*Session Chair*: **Janusz Konrad,** Boston Univ.

8:30 am: **Optimal design and critical analysis of a high resolution video plenoptic demonstrator**, Valter Drazic, Jean-Jacques Sacré, Jérôme Bertrand, Arno Schubert, Technicolor (France). . . . . .[7863-42]

8:50 am: **Geometric and subjective analysis of stereoscopic I3A cluster images,** Mikko Kytö, Jussi Hakala, Pirkko Oittinen, Aalto Univ. School of Science and Technology (Finland) . . . . . .[7863-43]

**Grand Peninsula Ballroom A . . Thurs. 9:10 to 10:10 am**

**Discussion Forum II**

Coffee Break . . . . . .10:10 to 10:50 am

## SESSION 16

**Grand Peninsula Ballroom A. . . . . .Thurs. 10:50 am to 12:30 pm**

### Stereoscopic Production and Playback

*Session Chair*: **Samuel Z. Zhou,** IMAX Corp. (Canada)

10:50 am: **The Dynamic Floating Window: a new creative tool for 3D movies**, Brian R. Gardner, Independent 3D Consultant (United States) . . . . . .[7863-44]

11:10 am: **Stereo video inpainting**, Felix Raimbault, Anil Kokaram, Trinity College Dublin (Ireland) . . . . . .[7863-45]

11:30 am: **A modified non-local mean inpainting technique for occlusion filling in depth-image based rendering**, Lucio Azzari, Federica Battisti, Univ. degli Studi di Roma Tre (Italy); Atanas P. Gotchev, Tampere Univ. of Technology (Finland); Marco Carli, Univ. degli Studi di Roma Tre (Italy); Karen Egiazarian, Tampere Univ. of Technology (Finland) .[7863-46]

11:50 am: **A study on the stereoscopic codecs for non-real time 3DTV services**, BongHo Lee, Electronics and Telecommunications Research Institute (Korea, Republic of) . . . . . .[7863-47]

12:10 pm: **A modular cross-platform GPU-based approach for flexible 3D video playback,** Roger Olsson, Håkan Andersson, Mårten Sjöström, Mid Sweden Univ. (Sweden) . . . . . .[7863-48]

**Grand Peninsula Ballroom A . . . . . Thurs. 12:30 to 12:40 pm**

### SD&A Closing Remarks

Visit the SD&A conference website for the latest information about the SD&A conference: www.stereoscopic.org

# Conference 7864A

Monday-Tuesday 24-25 January 2011 • Part of Proceedings of SPIE Vol. 7864

# 3D Imaging Metrology

*Conference Chairs:* **J. Angelo Beraldin,** National Research Council Canada (Canada); **Geraldine S. Cheok,** National Institute of Standards and Technology; **Michael B. McCarthy,** National Physical Lab. (United Kingdom); **Ulrich Neuschaefer-Rube,** Physikalisch-Technische Bundesanstalt (Germany)

*Program Committee:* **Burcu Akinci,** Carnegie Mellon Univ.; **Jan Boehm,** Univ. College London (United Kingdom); **Robert Emmett Bridges,** FARO Technologies Inc.; **Simone Carmignato,** Univ. degli Studi di Padova (Italy); **Luc Cournoyer,** National Research Council Canada (Canada); **Sabry F. El-Hakim,** Carleton Univ. (Canada); **Guy Godin,** National Research Council Canada (Canada); **Gabriele Guidi,** Politecnico di Milano (Italy); **W. Darin Ingimarson,** Quantapoint, Inc.; **Kenichi Kanatani,** Okayama Univ. (Japan); **Derek D. Lichti,** Univ. of Calgary (Canada); **Alan M. Lytle,** National Institute of Standards and Technology; **Hans-Gerd Maas,** Technische Univ. Dresden (Germany); **Masaaki Mochimaru,** National Institute of Advanced Industrial Science and Technology (Japan); **Norbert Pfeifer,** Technische Univ. Wien (Austria); **Steven D. Phillips,** National Institute of Standards and Technology; **Paul W. Reed,** The Boeing Co.; **Stuart Robson,** Univ. College London (United Kingdom); **Robert Sablatnig,** Technische Univ. Wien (Austria); **Kamel S. Saidi,** National Institute of Standards and Technology; **Jonathan M. Saint Clair,** The Boeing Co.; **Marc Soucy,** InnovMetric Software, Inc. (Canada); **M. George Vosselman,** International Institute for Geo-Information Science and Earth Observation (Netherlands); **Gregory C. Walsh,** Leica Geosystems HDS, LLC

## Monday 24 January

### SESSION 1

**Sandpebble Room A . . . . . Mon. 8:20 to 10:10 am**

#### Theory and New Methods for 3D Metrology

*Session Chair*: **J. Angelo Beraldin,** National Research Council Canada (Canada)

8:20 am: **Traceable hierarchical procedures for dimensional metrology** *(Invited Paper)*, David K. MacKinnon, J. Angelo Beraldin, Luc Cournoyer, Benjamin Carrier, National Research Council Canada (Canada)[7864A-01]

8:50 am: **Harmonic distortion free distance estimation in ToF camera**, Byongmin Kang, Seong-Jin Kim, Keechang Lee, James D. K. Kim, Chang-Yeong Kim, Samsung Advanced Institute of Technology (Korea, Republic of) . . . . . [7864A-02]

9:10 am: **Separating true range measurements from multi-path and scattering interference in commercial range cameras**, Adrian A. Dorrington, John P. Godbaz, Michael J. Cree, Andrew D. Payne, Lee V. Streeter, The Univ. of Waikato (New Zealand) . . . . . [7864A-03]

9:30 am: **3D imaging studies of rigid-fiber sedimentation**, David W. Vahey, Tim Scott, U.S. Forest Service (United States); Emilio J. Tozzi, Univ. of California, Davis (United States); Daniel J. Klingenberg, Univ. of Wisconsin-Madison (United States) . . . . . [7864A-04]

9:50 am: **Depth upsampling method using the confidence map for a fusion of a high resolution color sensor and low resolution time-of-flight depth sensor**, Kwanghyuk Bae, Kyu-Min Kyung, Tae-Chan Kim, SAMSUNG Electronics Co., Ltd. (Korea, Republic of) . . . . . [7864A-05]

Coffee Break . . . . . .10:10 to 10:50 am

### SESSION 2

**Sandpebble Room A . . . . . Mon. 10:50 to 11:50 am**

#### Instruments and Methods for 3D Metrology from Images

*Session Chair*: **J. Angelo Beraldin,** National Research Council Canada (Canada)

10:50 am: **Instrument for 3D characterization of autostereoscopic displays**, Jessica Prevoteau, Univ. de Reims Champagne-Ardenne (France) and 3DTV Solutions (France); Sylvia Chalençon-Piotin, Univ. de Reims Champagne-Ardenne (France); Didier G. Debons, 3DTV Solutions (France); Laurent Lucas, Yannick Remion, Univ. de Reims Champagne-Ardenne (France) and 3DTV Solutions (France) . . . . . [7864A-06]

11:10 am: **Accurate stereo matching based on multiband imaging**, Motonori Doi, Atsushi Minami, Osaka Electro-Communication Univ. (Japan); Shoji Tominaga, Chiba Univ. (Japan). . . . . [7864A-07]

11:30 am: **Flash trajectory imaging of target 3D motion**, Xinwei Wang, Yan Zhou, Songtao Fan, Jun He, Yuliang Liu, Institute of Semiconductors (China) . . . . . [7864A-24]

Lunch Break . . . . . 11:50 to 2:00 pm

### SESSION 3

**Sandpebble Room A . . . . . Mon. 2:00 to 3:20 pm**

#### Measurement Standards and Calibration

*Session Chair*: **David K. MacKinnon,** National Research Council Canada (Canada)

2:00 pm: **The ASTM E57 file format for 3D imaging data exchange** *(Invited Paper)*, Daniel Huber, Carnegie Mellon Univ. (United States) . . . . . [7864A-10]

2:20 pm: **The impact of different alignment strategies on the overall performance of a white light scanner according to the uncertainty especial according to sphere spacing error specified in VDI 2634**, Erik Klaas, Breuckmann GmbH (Germany) . . . . . [7864A-11]

2:40 pm: **Simulation-based determination of local probing uncertainty for fringe projection measurements**, Johannes Weickmann, Albert A. Weckenmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . [7864A-12]

3:00 pm: **Low cost characterization of TOF range sensors resolution**, Gabriele Guidi, Michele Russo, Grazia Magrassi, Monica Bordegoni, Politecnico di Milano (Italy) . . . . . [7864A-13]

Coffee Break . . . . . 3:20 to 4:00 pm

4:00 pm: **Introducing the depth transfer curve for 3D capture system characterization**, Kalin Atanassov, Vikas Ramachandra, Sergio R. Goma, Qualcomm Inc. (United States) . . . . . [7864A-14]

## SESSION 4

**Sandpebble Room A . . . . . Mon. 4:20 to 5:00 pm**

### Measurement and Uncertainty I

*Session Chair*: **Ulrich Neuschaefer-Rube,** Physikalisch-Technische Bundesanstalt (Germany)

4:20 pm: **Assessment of the quality of as-is building information models generated from point clouds using deviation analysis**, Engin B. Anil, Pingbo Tang, Burcu Akinci, Daniel Huber, Carnegie Mellon Univ. (United States). . . . . [7864A-16]

4:40 pm: **Content-based depth estimation in focused plenoptic camera**, Sergio R. Goma, Kalin Atanassov, Qualcomm Inc. (United States); Todor G. Georgiev, Adobe Systems Inc. (United States) . . . . . [7864A-17]

## Tuesday 25 January

**Grand Peninsula Ballroom A . . . . Tues. 8:20 to 9:20 am**

### Plenary Session and Society Award Presentations

8:25 am: New Dimensions in Visual Quality, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

## SESSION 5

**Sandpebble Room A . . . . . Tues. 9:30 to 10:40 am**

### Measurement and Uncertainty II

*Session Chair*: **Michael B. McCarthy,** National Physical Lab. (United Kingdom)

9:30 am: **Measurement of micro gears: comparison of optical, tactile-optical, and CT-measurements** *(Invited Paper)*, Ulrich Neuschaefer-Rube, Markus Bartscher, Frank Härtig, Marko Neukamm, Physikalisch-Technische Bundesanstalt (Germany); Jürgen Goebbels, Bundesanstalt für Materialforschung und -prüfung (Germany) . . . . . [7864A-18]

10:00 am: **Method for measuring stereo camera depth accuracy based on stereoscopic vision**, Mikko Kytö, Mikko Nuutinen, Pirkko T. Oittinen, Aalto Univ. School of Science and Technology (Finland) . . . . . [7864A-19]

10:20 am: **Best practices for the 3D documentation of the Grotta Dei Cervi of Porto Badisco, Italy**, J. Angelo Beraldin, National Research Council Canada (Canada); Adriana Bandiera, Virginia Valzano, Univ. del Salento (Italy); Fabio Negro, CASPUR (Italy). . . . . [7864A-20]

Coffee Break . . . . . .10:40 to 11:10 am

## SESSION 6

**Sandpebble Room A . . . . . .Tues. 11:00 am to 11:50 pm**

### Artifact-based Characterization

*Session Chair*: **Ulrich Neuschaefer-Rube,** Physikalisch-Technische Bundesanstalt (Germany)

11:00 am: **NPL freeform artefact for verification of non-contact measuring systems** *(Invited Paper)*, Mike McCarthy, National Physical Lab. (United Kingdom) . . . . . [7864A-21]

11:30 am: **Proposed NRC-CNRC portable target case for short-range triangulation-based 3D imaging systems characterization**, Benjamin Carrier, David K. MacKinnon, Luc Cournoyer, J. Angelo Beraldin, National Research Council Canada (Canada) . . . . . [7864A-22]

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

# Conference 7864B

Wednesday-Thursday 26-27 January 2011 • Part of Proceedings of SPIE Vol. 7864

# 3D Image Processing (3DIP) and Applications II

*Conference Chair:* **Atilla M. Baskurt,** Univ. of Lyon (France)

*Program Committee:* **Mongi A. Abidi,** The Univ. of Tennessee; **Hugues Benoit-Cattin,** Univ. of Lyon (France); **Adrian G. Bors,** The Univ. of York (United Kingdom); **Saida Bouakaz,** Univ. of Lyon (France); **Mohamed Daoudi,** TELECOM Lille 1 (France); **Jean-Luc E. Dugelay,** EURECOM (France); **Florent Dupont,** Univ. of Lyon (France); **Afzal Godil,** National Institute of Standards and Technology; **Benoît M. Macq,** Univ. Catholique de Louvain (Belgium); **Serge Miguet,** Univ. of Lyon (France); **Levent Onural,** Bilkent Univ. (Turkey); **Eric Paquet,** National Research Council Canada (Canada); **Marc Pollefeys,** The Univ. of North Carolina at Chapel Hill and ETH Zurich (Switzerland); **Bülent Sankur,** Bogaziçi Üniv. (Turkey); **Peter Schelkens,** Vrije Univ. Brussel (Belgium); **Robert Sitnik,** Warsaw Univ. of Technology (Poland); **Michela Spagnuolo,** Consiglio Nazionale delle Ricerche (Italy); **Frédéric Truchetet,** Univ. de Bourgogne (France); **Stefano Tubaro,** Politecnico di Milano (Italy)

## Wednesday 26 January

**Grand Peninsula Ballroom A . . . . . Wed. 8:20 to 9:20 am**

### Plenary Session and Conference Award Presentations

8:25 am: **Problems in Biological Imaging: Opportunities for Signal Processing**, Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[EI11SE-102]

## SESSION 8

**Sandpebble Room A . . . . . Wed. 9:30 to 10:30 am**

### 3D Face Analysis, Reconstruction, Recognition

9:30 am: **3D shape descriptors for face segmentation and fiducial points detection: an anatomical-based analysis**, Augusto E. Salazar Jiménez, Univ. Nacional de Colombia Sede Medellín (Colombia); Alexander Cerón, Univ. Militar Nueva Granada (Colombia); Flavio A. Prieto Ortiz, Univ. Nacional de Colombia (Colombia). . . . . [7864B-25]

9:50 am: **An innovative approach in structured light systems**, Hussam Yousef, Regis Huez, Laurent Hussenet, Univ. de Reims Champagne-Ardenne (France) and IUT Reims Châlons Charleville (France); Michel Herbin, Univ. de Reims Champagne-Ardenne (France) and ENSAM (France) . . . . . [7864B-26]

10:10 am: **Automatic extraction of facial interest points based on 2D and 3D data**, Nesli Erdogmus, Jean-Luc E. Dugelay, EURECOM (France) . . . . . [7864B-27]

Coffee Break . . . . . .10:30 to 11:10 am

## SESSION 9

**Sandpebble Room A . . . . . Wed. 11:10 am to 12:30 pm**

### 3D Shape Modeling, Retrieval, Recognition

11:10 am: **Deformable shape retrieval using bag-of-feature techniques**, Hedi Tabia, Mohamed Daoudi, Jean-Philippe Vandeborre, TELECOM Lille 1 (France); Olivier Colot, Univ. des Sciences et Technologies de Lille (France) . . . . . [7864B-28]

11:30 am: **3D keypoint detectors and descriptors for 3D objects recognition with TOF camera**, Ayet Shaiek, Fabien Moutarde, MINES ParisTech (France). . . . . [7864B-29]

11:50 am: **Recovering primitives in 3D CAD meshes**, Roseline Bénière, Gérard Subsol, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France); Gilles Gesquière, Lab. des Sciences de l'Information et des Systèmes (France); François Le Breton, C4W (France); William Puech, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France) . . . . . [7864B-30]

12:10 pm: **Salient volumetric local features for 3D shape retrieval**, Afzal Godil, National Institute of Standards and Technology (United States) . . . . . [7864B-31]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 10

**Sandpebble Room A . . . . . Wed. 2:00 to 3:00 pm**

### 3D Urban Modeling

2:00 pm: **Automatic generation of 3D building models from orthogonal building footprint**, Kenichi Sugihara, Gifu Keizai Univ. (Japan); Xinxin Zhou, Nagoya Bunri Univ. (Japan); Takahiro Murase, Chukyo Gakuin Univ. (Japan). . . . . [7864B-32]

2:20 pm: **Automatic 3D high-fidelity traffic interchange modeling using 2D road GIS data**, Jie Wang, Yuzhong Shen, Old Dominion Univ. (United States) . . . . . [7864B-33]

2:40 pm: **3D obstacle detection from roadside laser scans**, Avideh Zakhor, Univ. of California, Berkeley (United States) . . . . . [7864B-34]

## SESSION 11

**Sandpebble Room A . . . . . Wed. 3:00 to 5:20 pm**

### 3D Image Processing

3:00 pm: **Feature vertices for 3D synchronization using Euclidean minimum spanning tree**, Nicolas Tournier, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France) and Stratégies S.A. (France); William Puech, Gérard Subsol, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France); Jean-Pierre Pedeboy, Stratégies S.A. (France) . . . . . [7864B-35]

Coffee Break . . . . . 3:20 to 4:00 pm

4:00 pm: **Probability distributions from Riemannian geometry, generalized hybrid Monte Carlo sampling, and path integrals**, Eric Paquet, National Research Council Canada (Canada); Herna L. Viktor, Univ. of Ottawa (Canada) . . . . . [7864B-36]

4:20 pm: **Compression method by using the motion estimation of residual image transformed from elemental image array in three-dimensional integral imaging**, Cheol Hwa Yoo, Ju-Han Lee, Hohyun Kang, Eun-Soo Kim, Kwangwoon Univ. (Korea, Republic of). . [7864B-37]

4:40 pm: **Detection of the aortic intimal tears by using 3D digital topology**, Christophe Lohou, Instituts Universitaires de Technologie (France); Bruno Miguel, CHU Clermont-Ferrand (France). . . . . [7864B-38]

5:00 pm: **3D reconstruction by using graph cuts in SEM images**, Sila Girgin, Institut Français du Pétrole (France); Stéphane Bres, Institut National des Sciences Appliquées de Lyon (France); Maxime Moreaud, Laurent C. Duval, Institut Français du Pétrole (France). . . . . [7864B-39]

## Thursday 27 January

## SESSION 12

**Sandpebble Room A . . . . . Thurs. 8:30 to 10:10 am**

### 3D Image Capture, Display, Quality Control

8:30 am: **Data processing path from multimodal 3D measurement to realistic virtual model**, Robert Sitnik, Jakub F. Krzeslowski, Grzegorz Maczkowski, Warsaw Univ. of Technology (Poland). . . . . [7864B-40]

8:50 am: **Preliminary study of statistical pattern recognition-based coin counterfeit detection by means of high resolution 3D scanners**, Marcus Leich, Stefan Kiltz, Christian Kraetzer, Jana Dittmann, Claus Vielhauer, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . [7864B-41]

9:10 am: **3D digitization of metallic specular surfaces using scanning from heating approach**, Alban Bajard, Olivier Aubreton, Univ. de Bourgogne (France). . . . . [7864B-42]

9:30 am: **3D image processing architecture for camera phones**, Kalin Atanassov, Vikas Ramachandra, Milivoje Aleksic, Sergio R. Goma, Qualcomm Inc. (United States) . . . . . [7864B-43]

9:50 am: **Return detection for outdoor active triangulation**, David M. Ilstrup, Roberto Manduchi, Univ. of California, Santa Cruz (United States) . . . . . [7864B-44]

Tuesday 25 January 2011 • Part of Proceedings of SPIE Vol. 7864

# The Engineering Reality of Virtual Reality 2011

*Conference Chairs:* **Ian E. McDowall,** Fakespace Labs, Inc.; **Margaret Dolinsky,** Indiana Univ.

## Tuesday 25 January

**Grand Peninsula Ballroom A . . . . . .Tues. 8:20 to 9:20 am**

**Plenary Session and Society Award Presentations**

8:25 am: **New Dimensions in Visual Quality**, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

## SESSION 13

**Sumac Room . . . . . Tues. 2:00 to 3:20 pm**

### Adventurous Displays

2:00 pm: **Acquisition of stereo panoramas for display in VR environments**, Richard A. Ainsworth, Ainsworth & Partners, Inc. (United States); Daniel J. Sandin, Univ. of California, San Diego (United States) and Univ. of Illinois at Chicago (United States); Jurgen P. Schulze, Andrew Prudhomme, Thomas A. DeFanti, Univ. of California, San Diego (United States) . . . . . [7864C-46]

2:20 pm: **Low cost heads-up virtual reality (HUVR) with optical tracking and haptic feedback**, Todd Margolis, Thomas A. DeFanti, Greg Dawe, Andrew Prudhomme, Jurgen P. Schulze, Univ. of California, San Diego (United States). . . . . [7864C-47]

2:40 pm: **An integrated pipeline to create and experience compelling scenarios in virtual reality**, Carolina Cruz-Neira, Dirk Reiners, Jan Springer, Univ. of Louisiana at Lafayette (United States) . . . . . [7864C-48]

## SESSION 14

**Sumac Room . . . . . Tues. 3:00 to 5:00 pm**

### Encounters and Actions

3:00 pm: **Whose point-of-view is it anyway?**, Gregory P. Garvey, Quinnipiac Univ. (United States) . . . . . [7864C-49]

Coffee Break . . . . . 3:20 to 4:00 pm

4:00 pm: **Biocybrid systems and the reengineering of life**, Diana Domingues, Univ. de Brasília (Brazil) and LART-Lab. Research in Art and TechnoScience (Brazil); Adson Rocha, Camila Hamdan, Leci Augusto, Univ. de Brasília (Brazil). . . . . [7864C-50]

4:20 pm: **Twisting the sense of space in immersive trees**, Meehae Song, Simon Fraser Univ. (Canada); Steven J. Barnes, University of British Columbia (Canada); Diane Gromala, Simon Fraser Univ. (Canada) . . . . . [7864C-51]

4:40 pm: **Productive confusions: learning from simulations of pandemic virus outbreaks in second life**, Micha Cardenas, Univ. of California, San Diego (United States); Laura S. Greci, Univ. of California, San Diego (United States) and Veterans Administration San Diego (United States); Samantha Hurst, Karen Garman, Helene Hoffman, Ricky Huang, Michael Gates, Kristen Kho, Elle Mehrmand, Todd Porteous, Univ. of California, San Diego (United States); Alan Calvitti, Univ. of California, San Diego (United States) and Veterans Administration San Diego (United States); Erin Higginbotha, Veterans Administration San Diego (United States); Zia Agha M.D., Univ. of California, San Diego (United States) and Veterans Administration San Diego (United States) . . . . . [7864C-52]

# Conference 7865

Monday-Thursday 24-27 January 2011 • Proceedings of SPIE Vol. 7865

# Human Vision and Electronic Imaging XVI

*Conference Chairs:* **Bernice E. Rogowitz,** Visual Perspectives Consulting; **Thrasyvoulos N. Pappas,** Northwestern Univ.

*Program Committee:* **Albert J. Ahumada, Jr.,** NASA Ames Research Ctr.; **Jan P. Allebach,** Purdue Univ.; **Erhardt Barth,** Univ. zu Lübeck (Germany); **Walter R. Bender,** MIT Media Lab.; **Michael H. Brill,** Datacolor; **John C. Dalton,** Synthetik Software; **Scott J. Daly,** Dolby Labs., Inc.; **Huib de Ridder,** Technische Univ. Delft (Netherlands); **Elena A. Fedorovskaya,** Eastman Kodak Co.; **Jennifer Gille,** Qualcomm Inc.; **Sheila S Hemami,** Cornell Univ.; **Laurent Itti,** The Univ. of Southern California; **Stanley A. Klein,** Univ. of California, Berkeley; **Patrick Le Callet,** Univ. de Nantes (France); **John J. McCann,** McCann Imaging; **Jeffrey B. Mulligan,** NASA Ames Research Ctr.; **Karol Myszkowski,** Max-Planck-Institut für Informatik (Germany); **Adar Pelah,** The Univ. of York (United Kingdom); **Eliezer Peli,** Schepens Eye Research Institute; **Sylvia C. Pont,** Technische Univ. Delft (Netherlands); **Hawley K. Rising III,** Consultant; **Sabine E. Süsstrunk,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Christopher W. Tyler,** The Smith-Kettlewell Eye Research Institute; **Andrew B. Watson,** NASA Ames Research Ctr.

## Monday 24 January

**Regency Ballroom B . . . . . Mon. 9:30 am to 12:20 pm**

### Keynote Session

*Session Chairs*: **Bernice E. Rogowitz,** Visual Perspectives Consulting; **Thrasyvoulos N. Pappas,** Northwestern Univ.

9:30 am: **Visualization grand challenges**, Georges G. Grinstein, Univ. of Massachusetts Lowell (United States) . . . . . .[7865-01]

Coffee Break . . . . . .10:20 to 10:40 am

10:40 am: **How 3D immersive visualization is changing medical diagnostics** *(Invited Paper)*, Anton Koning, Erasmus MC (Netherlands) . . . . . .[7865-02]

11:30 am: **Vision as user interface**, Jan J. Koenderink, Delft Univ. of Technology (Netherlands) . . . . . .[7865-03]

Lunch Break . . . . . 12:20 to 2:00 pm

## SESSION 2

**Regency Ballroom B . . . . . Mon. 2:00 to 3:20 pm**

### Design, Composition, and Illumination

*Session Chair*: **Thrasyvoulos N. Pappas,** Northwestern Univ.

2:00 pm: to come [7865-50]

2:20 pm: **What makes good image composition?**, Ron Banner, Hewlett-Packard Labs. Israel Ltd. (Israel) . . . . . .[7865-05]

2:40 pm: **A comparison of perceived lighting characteristics in simulations versus real-life setup**, Bart A. Salters, Pieter J. H. Seuntiens, Philips Research Nederland B.V. (Netherlands) . . . . . .[7865-06]

3:00 pm: **Investigating two features of aesthetic perception in consumer photographic images: clutter and center**, Cathleen D. Cerosaletti, Alexander C. P. Loui, Andrew C. Gallagher, Eastman Kodak Co. (United States) . . . . . .[7865-07]

Coffee Break . . . . . 3:20 to 4:00 pm

## SESSION 3

**Regency Ballroom B . . . . . Mon. 4:00 to 5:40 pm**

### Extracting, Integrating, and Analyzing Features

*Session Chair*: **Bernice E. Rogowitz,** Visual Perspectives Consulting

4:00 pm: **Analyzing near-infrared images in utility assessment**, Neda Salamati, Zahra Sadeghipoor, Sabine E. Süsstrunk, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . .[7865-08]

4:20 pm: **Appearance-based human gesture recognition using multimodal features for human computer interaction**, Dan Luo, Waseda Univ. (Japan); Hua Gao, Hazim K. Ekenel, Karlsruher Institut für Technologie (Germany); Jun Ohya, Waseda Univ. (Japan) . . . . . .[7865-09]

4:40 pm: **Adaptive user interfaces for relating high-level concepts to low-level photographic parameters**, Edward Scott, Pubudu A. Madhawa Silva, Bryan Pardo, Thrasyvoulos N. Pappas, Northwestern Univ. (United States) . . . . . .[7865-10]

5:00 pm: **Parametric quality assessment of synthesized textures**, Darshan Siddalinga Swamy, Damon M. Chandler, Kellen J. Butler, Oklahoma State Univ. (United States); Sheila S. Hemami, Cornell Univ. (United States) . . . . . .[7865-11]

5:20 pm: **On the perception of band-limited phase distortion in natural scenes,** Kedarnath P. Vilankar, Logesh Vasu, Damon M. Chandler, Oklahoma State Univ. (United States) . . . . . .[7865-12]

**Regency Ballroom B . . . . . Mon. 7:00 to 10:30 pm**

### Human Vision and Electronic Imaging Banquet

*Banquet Speaker:*

**Mark Changizi,** Rensselaer Polytechnic Institute

### The Evolution of Color, Illusions, Forward-Facing Eyes and Writing for Humans...and Aliens

*Abstract:* Why do humans see in color? Why do we have eyes on the front of our heads, like cats, rather than on the sides, like horses? And how is it that we find it so easy to read when written language did not exist until a few thousand years ago--a virtual millisecond in evolutionary time? These are just a few of the riddles theoretical neurobiologist Mark Changizi explores in his talk on Alien Vision Revolution. Searching for the design principles behind color vision, binocularity, motion, and object recognition, Changizi suggests what they say about human nature and the circumstances in which it was formed. He also uses those principles to extrapolate how extraterrestrial beings would be likely to see--probably the same sorts of writing but not the same colors, and not with eyes that face forward.

## Tuesday 25 January

**Grand Peninsula Ballroom A. . . . . Tues. 8:20 to 9:20 am**

### Plenary Session and Society Award Presentations

8:25 am: **New Dimensions in Visual Quality**, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

## SESSION 4

**Regency Ballroom B . . . . . .Tues. 9:30 am to 12:10 pm**

### Perceptual and Cognitive Challenges in the Visualization and Visual Analysis of Bioinformatics Data

*Session Chair*: **Bernice E. Rogowitz,** The Univ. of Texas at Austin

9:30 am: **Complex bioinformatics data: insights from data visualization and perception**, Tamara Munzner, The Univ. of British Columbia (Canada) . . . . . .[7865-13]

10:10 am: **Perceptual issues in the recovery and visualisation of integrated systems biology data**, Tony P. Pridmore, The Univ. of Nottingham (United Kingdom). . . . . .[7865-15]

Coffee Break . . . . . .10:30 to 11:10 am

11:10 am: **Using cellular network diagrams to interpret large-scale datasets: past progress and future challenges**, Peter D. Karp, Mario Latendresse, Suzanne Paley, SRI International (United States) . .[7865-16]

11:30 am: **Visualizing large high-throughput datasets based on the cognitive representation of biological pathways**, Axel Nagel, Max-Planck-Institut für Molekulare Pflanzenphysiologie (Germany); Oliver Thimm, BASF Plant Science Company GmbH (Germany); Mark Stitt, Björn Usadel, Max-Planck-Institut für Molekulare Pflanzenphysiologie (Germany) . . . . . .[7865-17]

11:50 am: **Metadata Mapper: A user interface web service for mapping data between independent visual analysis components, guided by perceptual rules,** Bernice E. Rogowitz, Visual Perspectives Consulting (United States); Adam Kubach, The Univ. of Texas at Austin (United States); Kris Urie, Field Museum (United States) . . . . . .[7865-18]

**Regency Ballroom B . . . . . .Tues. 12:10 to 1:00 pm**

### Discussion Session

Bioinformatics is a relatively new field, which uses computational and visualization capabilities to extract meaning and insights about biological systems and processes. We will discuss perceptual and cognitive issues in analyzing complex data, drawing from the experience of perceptual psychologists, computer scientists, and biologists working in this space. We will discuss how research in perception and cognition can contribute to this field, and explore perceptual research questions driven by the challenges in visualizing bioinformatics data.

Lunch Break . . . . . 1:00 to 2:00 pm

## SESSION 5

**Grand Peninsula Ballroom A . . . . . Tues. 2:00 to 2:40 pm**

### Evaluating the Quality of the Stereoscopic Experience I: Joint Session with Conference 7863

*Session Chairs*: **Andrew J. Woods,** Curtin Univ. (Australia); **Christopher W. Tyler,** The Smith-Kettlewell Eye Research Institute

2:00 pm: **Visual discomfort with stereo displays: effects of viewing distance and direction of vergence-accommodation conflict**, Takashi Shibata, Univ. of California, Berkeley (United States) and Waseda Univ. (Japan); Joohwan Kim, David M. Hoffman, Martin S. Banks, Univ. of California, Berkeley (United States). . . . . .[7863-24]

2:20 pm: **Effects of 3D display on accommodative and vergent responses and subsequent visual discomfort and motion sickness,** Shunnan Yang, Pacific Univ. (United States) . . . . . .[7863-66]

**Grand Peninsula Ballroom A. . . . . .Tues. 2:40 to 3:30 pm**

### Discussion Forum I: 3DTV Dangers: Truth or Fiction?

There has been a lot of recent discussion in the media about the potential dangers of 3DTVs and 3D Movies - and yet stereoscopes have been with us for over 150 years, 3D movies for over 50 years, and 3D viewing is also widely used in industry. 3DTV is, however, transitioning from a special event to a 24/7 experience and becoming available to a wider demographic. Where is the truth in the concerns being expressed, where are the falsehoods, and where are the gaps in our knowledge? The panelists will give their views on this important topic.

*Panel Moderator:*

**Lenny Lipton,** CTO, Oculus 3D

*Panel Members:*

**Marty Banks,** Univ. of California Berkeley

**Christopher Tyler,** Smith Kettlewell Eye Research Institute

**Christopher Riemann,** MD, Cincinnati Eye Institute

**Pete Ludé,** Senior Vice President, Engineering, Sony Electronics

Coffee Break . . . . . 3:30 to 4:00 pm

## SESSION 6

**Grand Peninsula Ballroom A . . . . . Tues. 4:00 to 5:20 pm**

### Evaluating the Quality of the Stereoscopic Experience II: Joint Session with Conference 7863

*Session Chairs*: **Christopher W. Tyler,** The Smith-Kettlewell Eye Research Institute; **Andrew J. Woods,** Curtin Univ. (Australia)

4:00 pm: **Effect of image scaling on stereoscopic movie experience**, Jukka P. Häkkinen, Jussi Hakala, Aalto Univ. School of Science and Technology (Finland); Miska Hannuksela, Nokia Research Ctr. (Finland); Pirkko Oittinen, Aalto Univ. School of Science and Technology (Finland). . . . . .[7863-25]

4:20 pm: **Examination of 3D visual attention in stereoscopic video content**, Quan Huynh-Thu, Luca Schiatti, Technicolor (France) .[7865-20]

4:40 pm: **Relationship between perception of image resolution and peripheral visual field in stereoscopic images**, Masahiko Ogawa, Kazunori Shidoji, Kyushu Univ. (Japan). . . . . .[7863-26]

5:00 pm: **Quantifying how the combination of blur and disparity affects the perceived depth,** Junle Wang, Marcus Barkowsky, Vincent Ricordel, Patrick Le Callet, Univ. de Nantes (France). . . . . .[7865-21]

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Depth perception enhancement based on chromostereopsis**, Jiyoung Hong, Ho-Young Lee, Dusik Park, Chang-Yeong Kim, Samsung Advanced Institute of Technology (Korea, Republic of) . . . . . .[7865-40]

**An evaluation of perceived color break-up on field-sequential color displays**, Masamitsu Kobayashi, Akiko Yoshida, Yasuhiro Yoshida, Sharp Corp. (Japan). . . . . .[7865-41]

**Text detection: effect of size and eccentricity**, Chien Hui Kao, Chien-Chung Chen, National Taiwan Univ. (Taiwan) . . . . . .[7865-42]

**Image enhancement of high digital magnification for patient with central vision loss**, Zhengzhou Li, Gang Luo, Eliezer Peli, Schepens Eye Research Institute (United States). . . . . .[7865-43]

**Quality versus intelligibility: studying human preferences for American Sign Language video**, Frank M. Ciaramello, Sheila S. Hemami, Cornell Univ. (United States) . . . . . .[7865-44]

**Metaphor progress report: image recall and blending**, Hawley K. Rising III, Independent Consultant (United States) . . . . . .[7865-45]

**Space perception in pictures**, Andrea J. van Doorn, Technische Univ. Delft (Netherlands); Johan Wagemans, Katholieke Univ. Leuven (Belgium); Huib de Ridder, Jan J. Koenderink, Technische Univ. Delft (Netherlands) . . . . . .[7865-46]

## Wednesday 26 January

**Grand Peninsula Ballroom A . . . . . Wed. 8:20 to 9:20 am**

### Plenary Session and Conference Award Presentations

8:25 am: **Problems in Biological Imaging: Opportunities for Signal Processing**, Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[EI11SE-102]

## SESSION 7

**Regency Ballroom B . . . . . Wed. 9:30 am to 12:30 pm**

### Perceptual Approaches to Video Quality

*Session Chair*: **Thrasyvoulos N. Pappas,** Northwestern Univ.

9:30 am: **Preferences for the balance between true image detail and noise**, Sachin G. Deshpande, Scott J. Daly, Sharp Labs. of America, Inc. (United States). . . . . .[7865-22]

9:50 am: **Measurement of compression-induced temporal artifacts in subjective and objective video quality assessment**, Claire Mantel, Gipsa-lab (France) and STMicroelectronics (France); Patricia Ladret, Gipsa-lab (France); Thomas Kunlin, STMicroelectronics (France) [7865-23]

10:10 am: **Perceived contrast of electronically magnified video**, Andrew M. Haun, Russell L. Woods, Eliezer Peli, Schepens Eye Research Institute (United States). . . . . .[7865-24]

Coffee Break . . . . . .10:30 to 11:10 am

11:10 am: **Estimating the impact of single and multiple freeze occurrences on video quality**, Tong Xiao, Kjell E. Brunnström, Acreo AB (Sweden) . . . . . .[7865-25]

11:30 am: **The effects of scene characteristics, resolution, and compression on the ability to recognize objects in video**, Joel Dumke, Carolyn G. Ford, Irena W. Stange, Institute for Telecommunication Sciences (United States) . . . . . .[7865-26]

11:50 am: **Supplemental subjective testing to evaluate the performance of image and video quality estimators**, Amy R. Reibman, AT&T Labs. Research (United States); Frank M. Ciaramello, Cornell Univ. (United States). . . . . .[7865-27]

12:10 pm: **On evaluation of video quality metrics**, Martin Cadik, Tunc O. Aydin, Karol Myszkowski, Hans P. Seidel, Max-Planck-Institut für Informatik (Germany). . . . . .[7865-28]

Lunch Break . . . . . 12:20 to 2:00 pm

## SESSION 8

**Regency Ballroom B . . . . . Wed. 2:00 to 3:20 pm**

### Visual Attention, Saliency, and Quality I: Joint Session with Conference 7867

*Session Chairs*: **Susan P. Farnand,** Rochester Institute of Technology; **Bernice E. Rogowitz,** Visual Perspectives Consulting; **Thrasyvoulos N. Pappas,** Northwestern Univ.

2:00 pm: **Interactions of visual attention and quality perception**, Judith A. Redi, EURECOM (France); Hantao Liu, Technische Univ. Delft (Netherlands); Rodolfo Zunino, Univ. degli Studi di Genova (Italy); Ingrid Heynderickx, Philips Research Nederland B.V. (Netherlands) . . .[7865-29]

2:20 pm: **Weighted-MSE based on saliency map for assessing video quality of H.264 broadcasted video streams**, Hugo Boujut, Bordeaux Univ. (France); Ofer Hadar, Ben-Gurion Univ. of the Negev (Israel); Jenny Benois-Pineau, Toufik Ahmed, Bordeaux Univ. (France); Patrick Bonnet, Audemat WorldCast Systems Group (France) . . . . . .[7867-33]

2:40 pm: **Task dependence of visual attention on compressed videos: point of gaze statistics and analysis**, Anish Mittal, Anush K. Moorthy, Wilson S. Geisler, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[7865-30]

3:00 pm: **Measuring contour degradation in natural image utility assessment: methods and analysis**, Guilherme O. Pinto, David M. Rouse, Sheila S. Hemami, Cornell Univ. (United States) . . . . . .[7865-31]

Coffee Break . . . . . 3:20 to 4:00 pm

## SESSION 9

**Regency Ballroom B . . . . . Wed. 4:00 to 5:20 pm**

### Visual Attention, Saliency, and Quality II: Joint Session with Conference 7867

*Session Chairs*: **Susan P. Farnand,** Rochester Institute of Technology; **Bernice E. Rogowitz,** Visual Perspectives Consulting; **Thrasyvoulos N. Pappas,** Northwestern Univ.

4:00 pm: **Evolution of attention mechanisms for early visual processing**, Thomas Müller, Alois Knoll, Technische Univ. München (Germany) . . . . . .[7865-32]

4:20 pm: **Learned saliency transformations for gaze guidance**, Eleonora Vig, Univ. zu Lübeck (Germany); Michael Dorr, Schepens Eye Research Institute (United States) and Univ. zu Lübeck (Germany); Erhardt Barth, Univ. zu Lübeck (Germany) . . . . . .[7865-33]

4:40 pm: **Metrics for regression testing and optimization of visual attention (saliency) models**, Richard J. Moore, Brian Stankiewicz, 3M Co. (United States). . . . . .[7867-34]

5:00 pm: **Naturalness and interestingness of test images for visual quality evaluation,** Raisa Halonen, Stina Westman, Pirkko T. Oittinen, Aalto Univ. School of Science and Technology (Finland) . . . . . .[7867-35]

**Regency Ballroom B . . . . . Wed. 5:20 to 6:00 pm**

**Discussion Session**

## Thursday 27 January

## SESSION 10

**Regency Ballroom B . . . . . Thurs. 8:30 to 11:55 am**

### Attention and Gaze in Constructing the Visual World

*Session Chairs*: **Elena A. Fedorovskaya,** Eastman Kodak Co.; **Bernice E. Rogowitz,** Visual Perspectives Consulting

8:30 am: **On the relationship between selective visual attention and visual consciousness**, Naotsugu Tsuchiya, Christof Koch, California Institute of Technology (United States) . . . . . .[7865-34]

9:20 am: **A gaze-contingent display to study contrast sensitivity under natural viewing conditions**, Michael Dorr, Peter J. Bex, Schepens Eye Research Institute (United States). . . . . .[7865-35]

9:50 am: **Analyzing complex gaze behavior in the natural world**, Jeff B. Pelz, Thomas Kinsman, Karen M. Evans, Rochester Institute of Technology (United States). . . . . .[7865-36]

Coffee Break . . . . . .10:15 to 10:40 am

10:40 am: **What your visual system sees where you are not looking: implications for imaging applications**, Ruth E. Rosenholtz, Massachusetts Institute of Technology (United States) . . . . . .[7865-37]

11:05 am: **Attention as a Bayesian inference process**, Sharat Chikkerur, Massachussets Institute of Technology (United States) . . . . . .[7865-38]

11:30 am: **Statistical modeling of surprise with applications to predicting attention and gaze,** Laurent Itti, The Univ. of Southern California (United States). . . . . .[7865-39]

**Regency Ballroom B . . . . . Thurs. 12:00 to 1:00 pm**

**Discussion Session**

**Excursion . . . . . Thurs. 2:00 pm**

### Museum Visit: San Francisco Museum of Modern Art. Exhibition and Discussion

As a complement to the special session on Attention and Gaze in Constructing the Visual World, we will be visiting a exhibition at the San Francisco Museum of Modern Art. Entitled, “Exposed: Voyeurism, Surveillance and the Camera Since 1870,” this exhibit explores how the camera is used to focus attention, and provides insight into changing trends since 1870. We will explore this exhibit with the curator, comparing the artistic and perceptual direction of attention.

Participants will leave the conference hotel at 2:00. Transportation and fee details to be provided later.

# Conference 7866

Monday-Thursday 24-27 January 2011 • Proceedings of SPIE Vol. 7866

# Color Imaging XVI: Displaying, Processing, Hardcopy, and Applications

*Conference Chairs:* **Reiner Eschbach,** Xerox Corp.; **Gabriel G. Marcu,** Apple Inc.; **Alessandro Rizzi,** Univ. degli Studi di Milano (Italy)

*Program Committee:* **Jan P. Allebach,** Purdue Univ.; **Scott J. Daly,** Dolby Labs., Inc.; **Phil J. Green,** London College of Communication (United Kingdom); **Roger D. Hersch,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Choon-Woo Kim,** Inha Univ. (Korea, Republic of); **Michael A. Kriss,** Consultant; **Fritz Lebowsky,** STMicroelectronics (France); **Nathan Moroney,** Hewlett-Packard Labs.; **Carinna E. Parraman,** Univ. of the West of England (United Kingdom); **Shoji Tominaga,** Chiba Univ. (Japan); **Stephen Westland,** Univ. of Leeds (United Kingdom)

## Monday 24 January

### SESSION 1

**Harbour Room A . . . . . Mon. 10:40 am to 12:10 pm**

#### Display I

*Session Chair*: **Reiner Eschbach,** Xerox Corp.

10:40 am: **Image reconstruction on multi-primary displays** *(Invited Paper)*, Candice Brown Eliott, Nouvoyance, Inc. (United States) .[7866-01]

11:10 am: **Exploiting multi-primary color display systems for improving perception in color deficiency observers**, Carlos E. Rodriguez Pardo, Gaurav Sharma, Univ. of Rochester (United States) . . . . . .[7866-02]

11:30 am: **R/G/B color crosstalk characterization and calibration for LCD displays**, Reza Safaee-Rad, Qualcomm Inc. (Canada); Milivoje Aleksic, Qualcomm Inc. (United States) . . . . . .[7866-03]

11:50 am: **Color gamut boundary optimization of wide gamut display devices**, Fritz Lebowsky, STMicroelectronics (France) . . . . . .[7866-04]

Lunch Break . . . . . 12:10 to 2:00 pm

### SESSION 2

**Harbour Room A . . . . . Mon. 2:00 to 3:40 pm**

#### Display II

*Session Chair*: **Gabriel G. Marcu,** Apple Inc.

2:00 pm: **Color correction for projected image on colored-screen based on a camera**, Daechul Kim, Tae-Hyoung Lee, Kyungpook National Univ. (Korea, Republic of); Myong-Hui Choi, Daegu Polytechnic College Univ. (Korea, Republic of); Yeong-Ho Ha, Kyungpook National Univ. (Korea, Republic of). . . . . .[7866-05]

2:20 pm: **Modeling LCD displays with local backlight dimming for image quality assessment**, Jari Korhonen, Nino Burini, Soren Forchhammer, Technical Univ. of Denmark (Denmark); Jesper M. Pedersen, Bang & Olufsen A/S (Denmark) . . . . . .[7866-06]

2:40 pm: **Content dependent selection of image enhancement parameters for mobile displays**, YoonGyoo Lee, Choon-Woo Kim, Yoo-Jin Kang, Ga-Hee Kim, Han-Eol Kim, Inha Univ. (Korea, Republic of) . . . . . .[7866-07]

3:00 pm: **Saliency-driven black point compensation**, Albrecht J. Lindner, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Nicolas Bonnier, Océ Print Logic Technologies (France); Sabine E. Süsstrunk, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . .[7866-08]

3:20 pm: **DIN 6164 for gamut mapping?**, Ursina Caluori, Dennis Küpper, Klaus Simon, EMPA (Switzerland). . . . . .[7866-09]

Coffee Break . . . . . 3:20 to 3:40 pm

### SESSION 3

**Harbour Room A . . . . . Mon. 4:00 to 4:40 pm**

#### High Dynamic Range Imaging

*Session Chair*: **Alessandro Rizzi,** Univ. degli Studi di Milano (Italy)

4:00 pm: **Estimation of low dynamic range images from single Bayer image using exposure look-up table for high dynamic range image**, Tae-Hyoung Lee, Yeong-Ho Ha, Kyungpook National Univ. (Korea, Republic of); Cheol-Hee Lee, Andong National Univ. (Korea, Republic of) . . . . . .[7866-10]

4:20 pm: **Flicker reduction in tone mapped HDR videos**, Benjamin Guthier, Stephan Kopf, Marc Eble, Wolfgang Effelsberg, Univ. Mannheim (Germany) . . . . . .[7866-11]

## Tuesday 25 January

**Grand Peninsula Ballroom A . . . . . Tues. 8:20 to 9:20 am**

**Plenary Session and Society Award Presentations**

8:25 am: New Dimensions in Visual Quality, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

### SESSION 4

**Harbour Room A . . . . . Tues. 9:30 to 10:30 am**

#### Applications

*Session Chair*: **Gabriel G. Marcu,** Apple Inc.

9:30 am: **Applying AR technology with a projector-camera system in a history museum**, Kimiyoshi Miyata, National Museum of Japanese History (Japan); Rina Shiroishi, Ochanomizu Univ. (Japan); Yuka Inoue, Bunkyo Univ. (Japan) . . . . . .[7866-12]

9:50 am: **Memory preservation made prestigious but easy**, Reiner Fageth, Christina Debus, CeWe Color AG & Co. OHG (Germany); Philipp Sandhaus, Carl von Ossietzky Univ. Oldenburg (Germany) . . . . .[7866-13]

10:10 am: **A method to estimate the UV content of illumination sources**, Phil Green, Yerin Chang, . . . . . .[7866-14]

Coffee Break . . . . . .10:30 to 11:10 am

## SESSION 5

**Harbour Room A . . . . . Tues. 11:10 am to 12:30 pm**

### Vision

*Session Chair*: **Alessandro Rizzi,** Univ. degli Studi di Milano (Italy)

11:10 am: **Knowledge exchange in the CREATE project: Colour Research for European Advanced Technology Employment**, Carinna E. Parraman, Univ. of the West of England (United Kingdom); Alessandro Rizzi, Univ. degli Studi di Milano (Italy) . . . . . .[7866-15]

11:30 am: **Is it turquoise + fuchsia = purple or is it turquoise + fuchsia = blue?**, Giordano B. Beretta, Nathan Moroney, Hewlett-Packard Labs. (United States). . . . . .[7866-16]

11:50 am: **Human vision based color edge detection**, Ari Kim, Hong Suk Kim, Seung-ok Park, Daejin Univ. (Korea, Republic of) . . . . . .[7866-17]

12:10 pm: **Color universal design: analysis of color category dependency on color vision type (2)**, Natsuki Kojima, Miyuki G. Kamachi, Yasuyo G. Ichihara, Kogakuin Univ. (Japan); Kei Ito, The Univ. of Tokyo (Japan). . . . . .[7866-18]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 6

**Harbour Room A . . . . . Tues. 2:00 to 3:20 pm**

### Image Processing

*Session Chair*: **Jan P. Allebach,** Purdue Univ.

2:00 pm: **Object classification by color normalization or calibration?**, Wolfram Hans, Dietrich W. Paulus, Univ. Koblenz-Landau (Germany) . . . . . .[7866-19]

2:20 pm: **Contrast preserving color fusion**, Jan Kamenicky, Barbara Zitova, Institute of Information Theory and Automation (Czech Republic) . . . . . .[7866-20]

2:40 pm: **Evaluating the smoothness of color transformations**, Anna Aristova, Zhaohui Wang, Jon Y. Hardeberg, Gjøvik Univ. College (Norway) . . . . . .[7866-21]

3:00 pm: **High capacity image barcodes using color separability**, Orhan Bulan, Gaurav Sharma, Univ. of Rochester (United States); Basak Oztan, Rensselaer Polytechnic Institute (United States) . . . . . .[7866-22]

Coffee Break . . . . . 3:20 to 4:00 pm

## SESSION 7

**Harbour Room A . . . . . Tues. 4:00 to 5:30 pm**

### The Dark Side of Color

*Session Chair*: **Reiner Eschbach,** Xerox Corp.

4:00 pm: **The color side of dark** *(Invited Paper)*, Raja Bala, Xerox Corp. (United States). . . . . .[7866-23]

4:15 pm: **What a bad signal from this strange device** *(Invited Paper)*, Alessandro Rizzi, Univ. degli Studi di Milano (Italy). . . . . .[7866-24]

4:30 pm: **HDR imaging and color constancy: Two sides of the same coin?** *(Invited Paper)*, John J. McCann, McCann Imaging (United States) . . . . . .[7866-25]

4:45 pm: **ICC profiles: are we better off without them?** *(Invited Paper)*, Giordano B. Beretta, Gary J. Dispoto, Eric Hoarau, I-Jong Lin, Jun Zeng, Hewlett-Packard Labs. (United States). . . . . .[7866-26]

5:00 pm: **Green halftoning: Can less be more?** *(Invited Paper, Presentation Only)*, Jan P. Allebach, Purdue Univ. (United States)[7866-27]

5:15 pm: **Can displays go wild? (Invited Paper),** Gabriel G. Marcu, Apple Inc. (United States) . . . . . .[7866-28]

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Spectral reflection and transmission prediction model of halftone image on fluorescent supports**, Gongcheng Shi, Yixin Zhang, Jie Chen, Wenhu Ni, Jiangnan Univ. (China). . . . . .[7866-55]

**The transmission of light affect the color reproduction of plastic print**, Jie Chen, Yixin Zhang, Gongcheng Shi, Zunyan Xu, Jiangnan Univ. (China) . . . . . .[7866-56]

**Reflectance model of plastic substrate halftone image based on Markov chain**, Wenhu Ni, Yixin Zhang, Gongcheng Shi, Jianhong Huang, Jiangnan Univ. (China). . . . . .[7866-57]

**Color image segmentation on region growing and multiscale clustering**, Weixing Wang, Henan Polytechnic Univ. (China). . . .[7866-58]

**Advanced spectral reflectance prediction model for color prints**, Dongwen Tian, Qingjuan Wang, Yixin Zhang, Jiangnan Univ. (China) . . . . . .[7866-59]

**Color reproduction performance of halftone color image printed on paper substrate**, Wenhu Ni, Yixin Zhang, Gongcheng Shi, Jianhong Huang, Jiangnan Univ. (China) . . . . . .[7866-60]

**Color image segmentation on region growing and multiscale clustering**, Jun-ding Sun, Weixing Wang, Zongpu Jia, Henan Polytechnic Univ. (China) . . . . . .[7866-61]

**Regression based characterization of color measurement instruments in printing applications**, Peter Nussbaum, Jon Y. Hardeberg, Gjøvik Univ. College (Norway) . . . . . .[7866-62]

**Printing anaglyph maps optimized for display**, Huanzhao Zeng, Hewlett-Packard Co. (United States); Ruzhu Zeng, Liming Univ. (China) .[7866-63]

**A restoration method for book scan images**, Hyungsoo Ohk, Sang Ho Kim, Donchul Choi, Samsung Electronics Co., Ltd. (Korea, Republic of) . . . . . .[7866-64]

## Wednesday 26 January

**Grand Peninsula Ballroom A . . . . . Wed. 8:20 to 9:20 am**

### Plenary Session and Conference Award Presentations

8:25 am: **Problems in Biological Imaging: Opportunities for Signal Processing**, Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[EI11SE-102]

## SESSION 8

**Harbour Room A . . . . . Wed. 9:30 to 10:30 am**

### Color Management and Control

*Session Chair*: **Carinna E. Parraman,** Univ. of the West of England (United Kingdom)

9:30 am: **Soft proofing of printed colours on substrates with optical brightening agents**, Nikhil S. Parab, Phil J. Green, London College of Communication (United Kingdom) . . . . . .[7866-29]

9:50 am: **Ghostscript color management**, Michael J. Vrhel, Ray P. Johnston, Artifex Software Inc. (United States) . . . . . .[7866-30]

10:10 am: **Color control of a lighting system using RGBW LEDs**, Midori Tanaka, Takahiko Horiuchi, Shoji Tominaga, Chiba Univ. (Japan)[7866-31]

Coffee Break . . . . . .10:30 to 11:10 am

## SESSION 9

**Harbour Room A . . . . . Wed. 11:10 am to 12:30 pm**

### Color Correction and Color Spaces

*Session Chair*: **Reiner Eschbach,** Xerox Corp.

11:10 am: **Brightness contrast under high surround luminance levels: psychophysical data vs CIECAM02**, Ye Seul Baek, Hong Suk Kim, Seung-Ok Park, Daejin Univ. (Korea, Republic of) . . . . . .[7866-32]

11:30 am: **LabRGB: optimization of bit allocation**, Fumio Nakaya, Fuji Xerox Co., Ltd. (Japan) . . . . . .[7866-33]

11:50 am: **Spatio-temporal colour correction of strongly degraded movies**, ABM Tariqul Islam, Ivar Farup, Gjøvik Univ. College (Norway) . . . . . .[7866-34]

12:10 pm: **Color correction optimization with hue regularization**, Heng Zhang, Huaping Liu, Oregon State Univ. (United States); Shuxue Quan, Broadcom Corp. (United States). . . . . .[7866-35]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 10

**Harbour Room A . . . . . Wed. 2:00 to 3:20 pm**

### Printing I

*Session Chair*: **Gabriel G. Marcu,** Apple Inc.

2:00 pm: **Spectral model of an electro-photographic printing system**, Michael A. Kriss, MAK Consulting (United States) . . . . . .[7866-36]

2:20 pm: **Optimized selection of image tiles for ink spreading calibration**, Thomas Bugnon, Roger D. Hersch, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . .[7866-37]

2:40 pm: **A preferred skin color enhancement method for photographic color reproduction**, Huanzhao Zeng, Hewlett-Packard Co. (United States); M. Ronnier Luo, Univ. of Leeds (United Kingdom)[7866-38]

3:00 pm: **Kubelka-Munk theory for efficient spectral printer modeling**, Mekides A. Abebe, Jeremie Gerhardt, Jon Y. Hardeberg, Gjøvik Univ. College (Norway) . . . . . .[7866-39]

Coffee Break . . . . . 3:20 to 4:00 pm

## SESSION 11

**Harbour Room A . . . . . Wed. 4:00 to 5:40 pm**

### Printing II

*Session Chair*: **Shoji Tominaga,** Chiba Univ. (Japan)

4:00 pm: **A simple color prediction model based on multiple dot gain curves**, Yuan Yuan Qu, Sasan Gooran, Linköping Univ. (Sweden)[7866-40]

4:20 pm: **Subsampled optimal noise management method for a robust separation based calibration of color printing systems**, Mu Qiao, J. Michael Sanchez, Yongda Chen, Isaac Case, Gouyau Lin, Xerox Corp. (United States). . . . . .[7866-41]

4:40 pm: **Investigating the wavelength dependency of dot gain in color print**, Mahziar Namedanian, Sasan Gooran, Daniel Nyström, Linköping Univ. (Sweden) . . . . . .[7866-42]

5:00 pm: **Fast approach for toner saving**, Ilia V. Safonov, Ilya V. Kurilin, Michael N. Rychagov, Samsung Electronics Co., Ltd. (Russian Federation); Ho Keun Lee, Sang Ho Kim, Donchul Choi, Samsung Electronics Co., Ltd. (Korea, Republic of). . . . . .[7866-43]

5:20 pm: **A virtual printer and reference printing conditions**, Phil Green, London College of Communication (United Kingdom); Craig Revie, FFEI UK (United Kingdom); David McDowell, Eastman Kodak Co. (United States) . . . . . .[7866-44]

# Thursday 27 January

## SESSION 12

**Harbour Room A . . . . . Thurs. 8:30 to 10:10 am**

### Halftoning I

*Session Chair*: **Michael A. Kriss,** Consultant

8:30 am: **Cost function analysis for stochastic clustered-dot halftoning based on direct binary search**, Puneet Goyal, Madhur Gupta, Purdue Univ. (United States); Carl Staelin, Mani Fischer, Hewlett-Packard Labs. Israel Ltd. (Israel); Omri Shacham, Hewlett-Packard Indigo Ltd. (Israel); Jan P. Allebach, Purdue Univ. (United States). . . . . .[7866-45]

8:50 am: **Stochastic clustered-dot screen design for improved smoothness**, Madhur Gupta, Puneet Goyal, Purdue Univ. (United States); Mani Fischer, Carl Staelin, Hewlett-Packard Labs. Israel Ltd. (Israel); Tamar Kashti, Omri Shacham, Hewlett-Packard Indigo Ltd. (Israel); Jan P. Allebach, Purdue Univ. (United States) . . . . . .[7866-46]

9:10 am: **Design of color screen tile vector sets**, Jin-Young Kim, Yung-Yao Chen, Purdue Univ. (United States); Mani Fischer, Hewlett-Packard Labs. Israel Ltd. (Israel); Omri Shacham, Hewlett-Packard Indigo Ltd. (Israel); Carl Staelin, Hewlett-Packard Labs. Israel Ltd. (Israel); Kurt Bengtson, Hewlett-Packard Co. (United States); Jan P. Allebach, Purdue Univ. (United States) . . . . . .[7866-47]

9:30 am: **UV Fluorescent Encoded Image Using Two Successive Filling Halftone Algorithms**, Yonghui Zhao, Shen-Ge Wang, Xerox Corp. (United States) . . . . . .[7866-48]

9:50 am: **Moire-free color halftoning using hexagonal geometry**, Robert P. Loce, Shen-Ge Wang, Xerox Corp. (United States) . . . . . .[7866-49]

Coffee Break . . . . . .10:10 to 10:50 am

## SESSION 13

**Harbour Room A . . . . . Thurs. 10:50 am to 12:10 pm**

### Halftoning II

*Session Chair*: **Reiner Eschbach,** Xerox Corp.

10:50 am: **A hybrid adaptive thresholding method for text with halftone pattern in scanned document images**, Songyang Yu, Wei Ming, Konica Minolta Systems Labs., Inc. (United States) . . . . . .[7866-50]

11:10 am: **Window-based spectral analysis of periodic color halftone screens**, Ahmed H. Eid, Brian E. Cooper, Edward E. Rippetoe, Lexmark International, Inc. (United States) . . . . . .[7866-51]

11:30 am: **Descreening of color halftone images in the frequency domain**, Charles J. Stanger, Thanh Tran, Elisa H. Barney Smith, Boise State Univ. (United States) . . . . . .[7866-52]

11:50 am: **Analog image backup with steganographic halftones**, Robert A. Ulichney, Ingeborg Tastl, Eric Hoarau, Hewlett-Packard Labs. (United States) . . . . . .[7866-53]

# Conference 7867

Monday-Wednesday 24-26 January 2011 • Proceedings of SPIE Vol. 7867

# Image Quality and System Performance VIII

*Conference Chairs:* **Susan P. Farnand,** Rochester Institute of Technology; **Frans Gaykema,** Océ Technologies B.V. (Netherlands)

*Program Committee:* **Peter D. Burns,** Carestream Health, Inc.; **Majed Chambah,** Univ. de Reims Champagne-Ardenne (France); **Luke C. Cui,** Lexmark International, Inc.; **Mark D. Fairchild,** Rochester Institute of Technology; **Dirk W. Hertel,** Sensata Technologies, Inc.; **Robin B. Jenkin,** Aptina Imaging Corp.; **Sang Ho Kim,** Samsung Electronics Co., Ltd. (Korea, Republic of); **Mohamed-Chaker Larabi,** Univ. de Poitiers (France); **Lindsay William MacDonald,** London College of Communication (United Kingdom); **Yoichi Miyake,** Chiba Univ. (Japan); **Göte S. Nyman,** Univ. of Helsinki (Finland); **Sophie Triantaphillidou,** Univ. of Westminster (United Kingdom); **Eric K. Zeise,** Kodak's Graphic Communications Group; **Hongqin Zhang,** Apple Inc.; **D. René Rasmussen,** Qi Analytics LLC

## Monday 24 January

### SESSION 1

**Regency Ballroom A . . . . . Mon. 10:40 am to 12:30 pm**

#### Image Quality in Print

*Session Chair*: **Frans Gaykema,** Océ Technologies B.V. (Netherlands)

10:40 am: **Image quality metrics for the evaluation of print quality**, Marius Pedersen, Jon Y. Hardeberg, Gjøvik Univ. College (Norway); Nicolas Bonnier, Océ Print Logic Technologies (France); Fritz Albregtsen, Univ. of Oslo (Norway). . . . . .[7867-01]

11:10 am: **Hyper error map based document stitching**, Luke C. Cui, Lexmark International, Inc. (United States) . . . . . .[7867-02]

11:30 am: **Quantification of perceived macro-uniformity**, Ki-Youn Lee, Yousun Bang, Heui-Keun Choh, Samsung Electronics Co., Ltd. (Korea, Republic of) . . . . . .[7867-03]

11:50 am: **Current practices in art image reproduction: image quality experimentation**, Susan P. Farnand, Rochester Institute of Technology (United States). . . . . .[7867-04]

12:10 pm: **Using image quality metrics to assess the ICC perceptual rendering intent**, Kristyn R. Falkenstern, Nicolas Bonnier, Océ Print Logic Technologies (France); Hans Brettel, Telecom ParisTech (France); Françoise Viénot, Muséum national d'Histoire naturelle (France) .[7867-05]

Lunch Break . . . . . 12:30 to 2:00 pm

### SESSION 2

**Regency Ballroom A . . . . . Mon. 2:00 to 3:20 pm**

#### Image Quality Attributes Characterization and Measurement I

*Session Chair*: **Sophie Triantaphillidou,** Univ. of Westminster (United Kingdom)

2:00 pm: **Development of perceptually calibrated objective metrics of noise**, Elaine W. Jin, Brian W. Keelan, Sergey F. Prokushkin, Aptina Imaging Corp. (United States). . . . . .[7867-06]

2:20 pm: **Perceptually relevant evaluation of noise power spectra in adaptive pictorial systems**, Brian W. Keelan, Robin B. Jenkin, Aptina Imaging Corp. (United States). . . . . .[7867-07]

2:40 pm: **A novel perceptual image quality measure for block based image compression**, Tamar Shoham, Dror Gill, Sharon Carmel, ICVT Ltd. (Israel) . . . . . .[7867-08]

3:00 pm: **A metric for predicting preferred coring level to reduce toner scatter in electrophotographic printing**, Hyung Jun Park, Samsung Electronics Co., Ltd. (Korea, Republic of); Jan P. Allebach, Purdue Univ. (United States). . . . . .[7867-09]

Coffee Break . . . . . 3:20 to 4:00 pm

### SESSION 3

**Regency Ballroom A . . . . . Mon. 4:00 to 5:20 pm**

#### Image Quality Attributes Characterization and Measurement II

*Session Chair*: **Luke C. Cui,** Lexmark International, Inc.

4:00 pm: **A universal and reference-free blurriness measure**, Chunhua Chen, Wen Chen, Jeffrey A. Bloom, Dialogic Media Labs (United States) . . . . . .[7867-11]

4:20 pm: **Issues in the design of a no-reference metric for perceived blur**, Hantao Liu, Technische Univ. Delft (Netherlands); Ingrid Heynderickx, Philips Research Nederland B.V. (Netherlands) . . . . . .[7867-12]

4:40 pm: **Evaluating super resolution algorithms**, Younjin Kim, Jong Hyun Park, Gunshik Shin, Hyun-Seung Lee, Dong-Hyun Kim, Se Hyeok Park, Jaehyun Kim, Samsung Electronics Co., Ltd. (Korea, Republic of) . . . . . .[7867-13]

5:00 pm: **Image quality assessment based on distortion identification**, Aladine Chetouani, Azeddine Beghdadi, Univ. Paris-Nord (France) . . . . . .[7867-14]

## Tuesday 25 January

**Grand Peninsula Ballroom A . . . . . Tues. 8:20 to 9:20 am**

#### Plenary Session and Society Award Presentations

8:25 am: **New Dimensions in Visual Quality**, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

### SESSION 4

**Regency Ballroom A . . . . . Tues. 9:30 to 10:30 am**

#### System Performance: Capture

*Session Chair*: **Göte S. Nyman,** Univ. of Helsinki (Finland)

9:30 am: **Image quality evaluation of light field photography**, Qiang Fu, Xi'an Institute of Optics and Precision Mechanics (China); Zhiliang Zhou, Univ. of Science and Technology of China (China); Yan Yuan, BeiHang Univ. (China); Bin Xiangli, The Academy of Opto-Electronics (China) . . . . . .[7867-15]

9:50 am: **Feature-based automatic color calibration for networked camera system**, Shoji Yamamoto, Tokyo Metropolitan College of Industrial Technology (Japan); Keisuke Taki, Norimichi Tsumura, Toshiya Nakaguchi, Yoichi Miyake, Chiba Univ. (Japan) . . . . . .[7867-16]

10:10 am: **Analysis of estimation error in image quality metrics**, Peter D. Burns, Carestream Health, Inc. (United States) . . . . . .[7867-17]

Coffee Break . . . . . .10:30 to 11:10 am

## SESSION 5

**Regency Ballroom A . . . . . .Tues. 11:10 am to 12:30 pm**

### System Performance: Video

*Session Chair*: **Mohamed-Chaker Larabi,** Univ. de Poitiers (France)

11:10 am: **LCD displays performance comparison by MTF measurement using the white noise stimulus method**, Carles Mitjà, Jaume Escofet, Univ. Politècnica de Catalunya (Spain) . . . . . .[7867-18]

11:30 am: **Improving the quality of H.264 by using a new rate control model**, Miryem Hrarti, Abdelhakim Saadane, Mohamed-Chaker Larabi, XLIM-SIC (France) . . . . . .[7867-19]

11:50 am: **A noble method on no-reference video quality assessment using block modes, motion vectors, boundary strength and quantization parameters of H.264/AVC**, Inkyung Park, Munchurl Kim, Korea Advanced Institute of Science and Technology (Korea, Republic of) . . . . . .[7867-20]

12:10 pm: **Prioritization of AL-FEC information for improving IP television services QoS**, Elena Mammi, Univ. degli Studi di Roma Tre (Italy); Giuseppe Russo, Paolo Talone, Fondazione Ugo Bordoni (Italy) . . . . . .[7867-21]

Lunch Break . . . . . 12:30 to 1:50 pm

## SESSION 6

**Regency Ballroom A . . . . . Tues. 2:00 to 3:40 pm**

### Image Quality Issues in Digital Photography: Joint Session with Conference 7876

*Session Chairs*: **Peter D. Burns,** Carestream Health, Inc.; **Jon S. McElvain,** Digital Imaging Systems

2:00 pm: **Reference image method for measuring quality of photographs produced by digital cameras**, Mikko Nuutinen, Aalto Univ. School of Science and Technology (Finland); Olli Orenius, Timo S. Säämänen, Univ. of Helsinki (Finland); Pirkko T. Oittinen, Aalto Univ. School of Science and Technology (Finland) . . . . . .[7867-22]

2:20 pm: **RAW camera DPCM compression performance analysis**, Katherine Bouman, Vikas Ramachandra, Kalin Atanassov, Mickey Aleksic, Sergio R. Goma, Qualcomm Inc. (United States) . . . . . .[7867-23]

2:40 pm: **Comparison of objective metrics for image sensor crosstalk characterization**, Alexander Dokoutchaev, Aptina Imaging Corp. (United States); Henrik Eliasson, Sony Ericsson Mobile Communications AB (Sweden); Feng Li, Aptina Imaging Corp. (United States). . . . . .[7876-20]

3:00 pm: **An image quality evaluation tool simulating image sensors including quantum efficiency off-axis effect**, Clémence Mornet, Jérôme M. Vaillant, Thomas Decroux, Nicolas Virollet, Didier Herault, STMicroelectronics (France); Isabelle Schanen, Institut de Microélectronique Électromagnétisme et Photonique (France) . .[7876-21]

3:20 pm: **Image quality assessment based on edge**, Xuanqin Mou, Min Zhang, Wufeng Xue, Xi'an Jiaotong Univ. (China); Lei Zhang, The Hong Kong Polytechnic Univ. (China). . . . . .[7876-22]

Coffee Break . . . . . 3:40 to 4:10 pm

## SESSION 7

**Regency Ballroom A . . . . . Tues. 4:00 to 5:20 pm**

### High Dynamic Range Imaging: Joint Session with Conference 7876

*Session Chairs*: **Susan P. Farnand,** Rochester Institute of Technology; **Ricardo J. Motta,** Attom Research

4:00 pm: **Brightness, lightness, and specifying color in high-dynamic-range scenes and images**, Mark D. Fairchild, Ping-Hsu Chen, Rochester Institute of Technology (United States) . . . . . .[7867-24]

4:20 pm: **Method for evaluating tone mapping operators for natural high dynamic range images**, Mikko Kuhna, Mikko Nuutinen, Pirkko Oittinen, Aalto Univ. School of Science and Technology (Finland)[7876-23]

4:40 pm: **High dynamic range imaging of non-static scenes**, Imtiaz Hossain, Bahadir Gunturk, Louisiana State Univ. (United States) [7876-24]

5:00 pm: **Evaluating HDR photos using Web 2.0 technology,** Guoping Qiu, Yujie Mei, The Univ. of Nottingham (United Kingdom) . . . . .[7867-25]

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Potential of face area data for predicting sharpness of natural images**, Mikko Nuutinen, Aalto Univ. School of Science and Technology (Finland); Olli Orenius, Timo S. Säämänen, Univ. of Helsinki (Finland); Pirkko T. Oittinen, Aalto Univ. School of Science and Technology (Finland)[7867-36]

**A video quality assessment model based on the MPEG-7**, Masaharu Sato, Yuukou Horita, Univ. of Toyama (Japan) . . . . . .[7867-37]

**Image quality: a tool for no-reference assessment methods**, Silvia Corchs, Francesca Gasparini, Fabrizio Marini, Raimondo Schettini, Univ. degli Studi di Milano-Bicocca (Italy) . . . . . .[7867-38]

**Extending video quality metrics to the temporal dimension with 2D-PCR**, Christian Keimel, Martin Rothbucher, Klaus Diepold, Technische Univ. München (Germany). . . . . .[7867-39]

**Image quality metric benchmarking on compressed image databases**, Michael Nauge, Mohamed-Chaker Larabi, Univ. de Poitiers (France) . . . . . .[7867-41]

**Optimal front light design for reflective displays in different ambient illumination**, Sheng-Po Wang, Ting-Ting Chang, Chien-Ju Li, Yi-Ho Bai, Kuo-Jui Hu, Industrial Technology Research Institute (Taiwan) . .[7867-42]

**Comparison of HDTV formats in a consumer environment**, Christian Keimel, Arne Redl, Klaus Diepold, Technische Univ. München (Germany) . . . . . .[7867-43]

## Wednesday 26 January

**Grand Peninsula Ballroom A . . . . . Wed. 8:20 to 9:20 am**

### Plenary Session and Conference Award Presentations

8:25 am: **Problems in Biological Imaging: Opportunities for Signal Processing**, Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[EI11SE-102]

## SESSION 8

**Regency Ballroom A . . . . . Wed. 9:30 to 10:10 am**

### Perceptual Image Quality Experimentation

*Session Chair*: **Mark D. Fairchild,** Rochester Institute of Technology

9:30 am: **Just noticeable difference vs. visual difference: hypotheses and how to check whether they are true or not**, Sergey N. Bezryadin, Pavel Burov, KWE International, Inc. (United States) . . . . . .[7867-26]

9:50 am: **Device dependent scene dependent quality predictions using effective pictorial information capacity**, Kyung Hoon Oh, Sophie Triantaphillidou, Ralph E. Jacobson, Univ. of Westminster (United Kingdom) . . . . . .[7867-27]

## SESSION 9

**Regency Ballroom A . . . . . Wed. 10:10 to 10:40 am**

### Discussion on Web-based IQ Testing

10:10 am: **Social image quality**, Guoping Qiu, Ahmed Kheiri, The Univ. of Nottingham (United Kingdom). . . . . .[7867-28]

Coffee Break . . . . . .10:40 to 11:10 am

## SESSION 10

**Regency Ballroom A . . . . . Wed. 11:10 am to 12:30 pm**

### System Performance: Security

*Session Chair*: **Robin B. Jenkin,** Aptina Imaging Corp.

11:10 am: **Utility studies for security encoded office documents: experimental design challenges**, Chris A. Deller, Geoff J. Woolfe, Canon Information Systems Research Australia Pty. Ltd. (Australia). . . .[7867-29]

11:30 am: **Printed fingerprints: a framework and first results towards detection of artificially printed latent fingerprints for forensics**, Stefan Kiltz, Mario Hildebrandt, Jana Dittmann, Claus Vielhauer, Christian Krätzer, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . . . .[7867-30]

11:50 am: **Monitoring image quality for security applications**, Mohamed-Chaker Larabi, Didier Nicholson, Univ. de Poitiers (France) . . . . . .[7867-31]

12:10 pm: **Video quality and interpretability study using SAMVIQ and Video-NIIRS**, Darrell L. Young, Raytheon Intelligence & Information Systems (United States); Jeff Ruszczyk, General Dynamics Advanced Information Systems (United States); Tariq Bakir, Harris (United States) . . . . . .[7867-32]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 11

**Regency Ballroom B . . . . . Wed. 2:00 to 3:20 pm**

### Visual Attention, Saliency, and Quality I: Joint Session with Conference 7865

*Session Chairs*: **Susan P. Farnand,** Rochester Institute of Technology; **Bernice E. Rogowitz,** Visual Perspectives Consulting; **Thrasyvoulos N. Pappas,** Northwestern Univ.

2:00 pm: **Interactions of visual attention and quality perception**, Judith A. Redi, EURECOM (France); Hantao Liu, Technische Univ. Delft (Netherlands); Rodolfo Zunino, Univ. degli Studi di Genova (Italy); Ingrid Heynderickx, Philips Research Nederland B.V. (Netherlands) . . .[7865-29]

2:20 pm: **Weighted-MSE based on saliency map for assessing video quality of H.264 broadcasted video streams**, Hugo Boujut, Bordeaux Univ. (France); Ofer Hadar, Ben-Gurion Univ. of the Negev (Israel); Jenny Benois-Pineau, Toufik Ahmed, Bordeaux Univ. (France); Patrick Bonnet, Audemat WorldCast Systems Group (France) . . . . . .[7867-33]

2:40 pm: **Task dependence of visual attention on compressed videos: point of gaze statistics and analysis**, Anish Mittal, Anush K. Moorthy, Wilson S. Geisler, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[7865-30]

3:00 pm: **Measuring contour degradation in natural image utility assessment: methods and analysis**, Guilherme O. Pinto, David M. Rouse, Sheila S. Hemami, Cornell Univ. (United States) . . . . . .[7865-31]

Coffee Break . . . . . 3:20 to 4:00 pm

## SESSION 12

**Regency Ballroom B . . . . . Wed. 4:00 to 5:20 pm**

### Visual Attention, Saliency, and Quality II: Joint Session with Conference 7865

*Session Chairs*: **Susan P. Farnand,** Rochester Institute of Technology; **Bernice E. Rogowitz,** Visual Perspectives Consulting; **Thrasyvoulos N. Pappas,** Northwestern Univ.

4:00 pm: **Evolution of attention mechanisms for early visual processing**, Thomas Müller, Alois Knoll, Technische Univ. München (Germany) . . . . . .[7865-32]

4:20 pm: **Learned saliency transformations for gaze guidance**, Eleonora Vig, Univ. zu Lübeck (Germany); Michael Dorr, Schepens Eye Research Institute (United States) and Univ. zu Lübeck (Germany); Erhardt Barth, Univ. zu Lübeck (Germany) . . . . . .[7865-33]

4:40 pm: **Metrics for regression testing and optimization of visual attention (saliency) models**, Richard J. Moore, Brian Stankiewicz, 3M Co. (United States). . . . . .[7867-34]

5:00 pm: **Naturalness and interestingness of test images for visual quality evaluation,** Raisa Halonen, Stina Westman, Pirkko T. Oittinen, Aalto Univ. School of Science and Technology (Finland) . . . . . .[7867-35]

**Regency Ballroom B . . . . . Wed. 5:20 to 6:00 pm**

### Discussion Session

# Conference 7868

Monday-Tuesday 24-25 January 2011 • Proceedings of SPIE Vol. 7868

# Visualization and Data Analysis 2011

*Conference Chairs:* **Pak Chung Wong,** Pacific Northwest National Lab.; **Jinah Park,** Korea Advanced Institute of Science and Technology (Korea, Republic of); **Ming C. Hao,** Hewlett-Packard Labs.; **Chaomei Chen,** Drexel Univ.

*Conference Co-Chairs:* **Katy Börner,** Indiana Univ.; **David L. Kao,** NASA Ames Research Ctr.; **Jonathan C. Roberts,** Bangor Univ. (United Kingdom)

*Program Committee:* **Madjid Allili,** Bishop's Univ. (Canada); **Loretta Auvil,** Univ. of Illinois at Urbana-Champaign; **Paul Craig,** Napier Univ. (United Kingdom); **Sussan Einakian,** The Univ. of Alabama in Huntsville; **Carsten Görg,** Georgia Institute of Technology; **Matti T. Gröhn,** Ctr. for Scientific Computing (Finland); **Ming Jiang,** Lawrence Livermore National Lab.; **Daniel A. Keim,** Univ. Konstanz (Germany); **Robert Kosara,** The Univ. of North Carolina at Charlotte; **Heidi Lam,** Google Inc.; **Bongshin Lee,** Microsoft Corp.; **Bob Lewis,** Washington State Univ.; **Lars Linsen,** Jacobs Univ. Bremen gGmbH (Germany); **Peter Lindstrom,** Lawrence Livermore National Lab.; **Zhanping Liu,** Kitware, Inc.; **Mark A. Livingston,** U.S. Naval Research Lab.; **Chris North,** Virginia Polytechnic Institute and State Univ.; **Lucille T. Nowell,** U.S. Dept. of Energy; **Renato Pajarola,** Univ. of Zurich (Switzerland); **William Pike,** Pacific Northwest National Lab.; **Aaron J. Quigley,** Univ. of St. Andrews (United Kingdom); **Jean Scholtz,** Pacific Northwest National Lab.; **Tobias Schreck,** Technische Univ. Darmstadt (Germany); **Christopher D. Shaw,** Simon Fraser Univ. (Canada); **Han-Wei Shen,** The Ohio State Univ.; **Mike Sips,** German Research Center for Geoscience (Germany); **Kalpathi R. Subramanian,** The Univ. of North Carolina at Charlotte; **Yinlong Sun,** Purdue Univ.; **Soon Tee Teoh,** San José State Univ.; **Melanie K. Tory,** Univ. of Victoria (Canada); **Matthew O. Ward,** Worcester Polytechnic Institute; **Thomas Wischgoll,** Wright State Univ.; **Zaixian Xie,** Worcester Polytechnic Institute; **Jing Yang,** The Univ. of North Carolina at Charlotte; **Eugene Zhang,** Oregon State Univ.

*Cosponsored by:*

## Monday 24 January

### SESSION 1

**Bayside Room A. . . . . .Mon. 8:50 to 10:10 am**

#### Proteins, Graphs, and Visualization

*Session Chair*: **Ming C. Hao,** Hewlett-Packard Labs.

8:50 am: **Data repository mapping for influenza protein sequence analysis**, Donald A. Pellegrino, Jr., Chaomei Chen, Drexel Univ. (United States) . . . . . .[7868-01]

9:10 am: **GPU-accelerated visualization of protein dynamics in ribbon mode**, Manuel Wahle, Stefan Birmanns, The Univ. of Texas Health Science Ctr. at Houston (United States) . . . . . .[7868-02]

9:30 am: **OpenOrd: an open-source toolbox for large graph layout**, Shawn Martin, William M. Brown, Sandia National Labs. (United States); Richard Klavans, Kevin Boyack, SciTech Strategies, Inc. (United States) . . . . . .[7868-03]

9:50 am: **A pseudo-haptic knot diagram interface**, Hui Zhang, Indiana Univ.-Purdue Univ. Indianapolis (United States); Jianguang Weng, Zhejiang Univ. (China); Andrew Hanson, Indiana Univ. (United States). . . .[7868-04]

Coffee Break . . . . . .10:10 to 10:50 am

### SESSION 2

**Bayside Room A. . . . . .Mon. 10:50 to 11:30 am**

#### Interactive Visualization and Applications

*Session Chair*: **Donald A. Pellegrino, Jr.,** Drexel Univ.

10:50 am: **Interactive isosurfaces with quadratic** $C^1$ splines on truncated octahedral partitions, Thomas Kalbe, Alexander Marinc, Technische Univ. Darmstadt (Germany); Markus Rhein, Univ. Mannheim (Germany); Michael Goesele, Technische Univ. Darmstadt (Germany) . . . [7868-05]

11:10 am: **Indirect multi-touch interaction for brushing in parallel coordinates**, Robert Kosara, The Univ. of North Carolina at Charlotte (United States). . . . . .[7868-06]

Session Break . . . . . .11:30 to 11:40 am

### SESSION 3

**Bayside Room A. . . . . Mon. 11:40 am to 12:20 pm**

#### Keynote Address

*Session Chair*: **Pak Chung Wong,** Pacific Northwest National Lab.

11:40 am: **The science of visual analysis at extreme scale** *(Presentation Only)*, Lucille T. Nowell, U.S. Dept. of Energy (United States) . . .[7868-07]

Lunch Break . . . . . 12:20 to 2:00 pm

### SESSION 4

**Bayside Room A. . . . . Mon. 2:00 to 3:00 pm**

#### Applications and Evaluations

*Session Chair*: **Robert F. Erbacher,** Northwest Security Institute

2:00 pm: **A randomized framework for discovery of heterogeneous mixtures**, Mark A. Livingston, Aditya M. Palepu, Jonathan Decker, Mikel Dermer, U.S. Naval Research Lab. (United States). . . . . .[7868-08]

2:20 pm: **Exploring height fields: interactive visualization and applications**, Madjid Allili, Alvaro Villares, Bishop's Univ. (Canada); David Corriveau, Univ. de Sherbrooke (United States) . . . . . .[7868-09]

2:40 pm: **An evaluation of methods for encoding multiple, 2D spatial data**, Mark A. Livingston, Jonathan Decker, Zhuming Ai, U.S. Naval Research Lab. (United States). . . . . .[7868-10]

Coffee Break . . . . . 3:20 to 4:00 pm

## SESSION 5

**Bayside Room A. . . . . Mon. 4:00 to 5:00 pm**

### Multivariate Visualization and Multiresolution Techniques

*Session Chair*: **Mark A. Livingston,** U.S. Naval Research Lab.

4:00 pm: **Multivariate visualization of chromatographic systems**, Timothy Urness, Thomas Marrinan, Andrew R. Johnson, Mark F. Vitha, Drake Univ. (United States) . . . . . .[7868-11]

4:20 pm: **Visualization of dynamic adaptive resolution scientific data**, Andrew Foulks, R. Daniel Bergeron, Samuel H. Vohr, The Univ. of New Hampshire (United States) . . . . . .[7868-12]

4:40 pm: **A flexible low-complexity device adaptation approach for data presentation**, René U. Rosenbaum, Sr., Alfredo Gimenez, Univ. of California, Davis (United States); Heidrun Schumann, Univ. Rostock (Germany); Bernd Hamann, Univ. of California, Davis (United States) . . . . . .[7868-13]

# Tuesday 25 January

**Grand Peninsula Ballroom A. . . . . Tues. 8:20 to 9:20 am**

### Plenary Session and Society Award Presentations

8:25 am: **New Dimensions in Visual Quality**, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

## SESSION 6

**Bayside Room A. . . . . Tues. 9:30 to 10:30 am**

### Visualization Techniques

*Session Chair*: **Robert F. Erbacher,** Northwest Security Institute

9:30 am: **EdgeMaps: visualizing explicit and implicit relations**, Marian Doerk, Sheelagh Carpendale, Carey Williamson, Univ. of Calgary (Canada) . . . . . .[7868-14]

9:50 am: **Visualizing node attribute uncertainty in graphs**, Nathaniel Cesario, Alex Pang, Univ. of California, Santa Cruz (United States) . . . . . .[7868-15]

10:10 am: **Interactive visualization of scattered moment tensor data**, Harald Obermaier, Univ. of Kaiserslautern (Germany); Magali I. Billen, Univ. of California, Davis (United States); Hans Hagen, Univ. of Kaiserslautern (Germany); Martin Hering-Bertram, Fraunhofer-Institut für Techno- und Wirtschaftsmathematik (Germany) . . . . . .[7868-16]

Coffee Break . . . . . .10:30 to 11:10 am

## SESSION 7

**Bayside Room A. . . . . .Tues. 11:10 am to 12:10 pm**

### Temporal Data and Frequency Analysis

*Session Chair*: **Aritra Dasgupta,** The Univ. of North Carolina at Charlotte

11:10 am: **Visualizing frequent patterns in large multivariate time series**, Ming C. Hao, Manish Marwah, Hewlett-Packard Labs. (United States); Halldor Janetzko, Univ. Konstanz (Germany); Ratnesh K. Sharma, Hewlett-Packard Labs. (United States); Daniel A. Keim, Univ. Konstanz (Germany); Umeshwar Dayal, Hewlett-Packard Labs. (United States); Debprakash Patnaik, Naren Ramakrishnan, Virginia Polytechnic Institute and State Univ. (United States) . . . . . .[7868-17]

11:30 am: **Visual pattern discovery in timed event data**, Matthias Schaefer, Franz Wanner, Florian Mansmann, Christian Scheible, Verity Stennett, Anders T. Hasselrot, Daniel A. Keim, Univ. Konstanz (Germany) . . . . . .[7868-18]

11:50 am: **Enhancing visualization with real-time frequency-based transfer functions**, Erald Vucini, Technische Univ. Wien (Austria); Daniel Patel, Christian Michelsen Research AS (Norway); Eduard Groeller, Technische Univ. Wien (Austria) . . . . . .[7868-19]

Lunch Break . . . . . 12:10 to 2:00 pm

## SESSION 8

**Bayside Room A. . . . . Tues. 2:00 to 2:40 pm**

### Invited Presentation

2:00 pm: **Scientific visualization for data analysis** *(Invited Paper, Presentation Only)*, David L. Kao, NASA Ames Research Ctr. (United States) . . . . . .[7868-34]

Session Break . . . . . 2:40 to 2:50 pm

## SESSION 9

**Bayside Room A. . . . . Tues. 2:50 to 3:30 pm**

### Anomaly Detection, Data Mining

*Session Chair*: **Robert F. Erbacher,** Northwest Security Institute

2:50 pm: **The role of visualization and interaction in maritime anomaly detection**, Maria Riveiro, Göran Falkman, Univ. of Skövde (Sweden) . . . . . .[7868-20]

3:10 pm: **Multiscale visual quality assessment for cluster analysis with self-organizing maps**, Jürgen Bernard, Tatiana von Landesberger, Sebastian Bremm, Tobias Schreck, Technische Univ. Darmstadt (Germany) . . . . . .[7868-21]

Coffee Break . . . . . 3:30 to 4:00 pm

## SESSION 10

**Bayside Room A. . . . . Tues. 4:00 to 4:40 pm**

### Visualization for Cyber Security

*Session Chair*: **Ming C. Hao,** Hewlett-Packard Labs.

4:00 pm: **Privacy-preserving data visualization using parallel coordinates**, Aritra Dasgupta, Robert Kosara, The Univ. of North Carolina at Charlotte (United States) . . . . . .[7868-22]

4:20 pm: **A tri-linear visualization for network anomaly detection**, Robert F. Erbacher, Northwest Security Institute (United States); Robert B. Whitaker, Utah State Univ. (United States) . . . . . .[7868-23]

Session Break . . . . . 4:40 to 4:50 pm

## SESSION 11

**Bayside Room A. . . . . Tues. 4:50 to 5:30 pm**

### Visual Analytics

*Session Chair*: **Pak Chung Wong,** Pacific Northwest National Lab.

4:50 pm: **EmailTime: visual analytics and statistics for temporal email**, Minoo Erfani Joorabchi, Ji-Dong Yim, Christopher D. Shaw, Simon Fraser Univ. (Canada) . . . . . .[7868-24]

5:10 pm: **A web-enabled visualization toolkit for geovisual analytics,** Quan Van Ho, Patrik Lundblad, Tobias Åström, Mikael Jern, Linköping Univ. (Sweden) . . . . . .[7868-25]

# Conference 7868

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

## Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**A 3D particle visualization system for temperature management**, Benoit Lange, Nancy Rodriguez, William Puech, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France); Hervé Rey, Xavier Vasques, IBM (France) . . . . . .[7868-27]

**A digital topology-based method for the topological filtering of a reconstructed surface**, Madjid Allili, Bishop's Univ. (Canada); Donglei Li, Univ. de Sherbrooke (Canada); Mohand-Said Allili, Univ. du Québec en Ottaouais (Canada) . . . . . .[7868-28]

**A meta-notation for data visualization**, Sang Yun Lee, Ulrich Neumann, The Univ. of Southern California (United States). . . . . .[7868-30]

**Enhancing online timeline visualizations with events and images**, Abhishek Pandya, Aniket Mulye, Soon Tee Teoh, San José State Univ. (United States). . . . . .[7868-32]

**Multivariate data visualization via outdoor scenes**, Benjamin A. Hillery, Robert P. Burton, Brigham Young Univ. (United States). . . . . .[7868-33]

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# Computer Vision and Image Analysis of Art II

*Conference Chairs:* **David G. Stork,** Ricoh Innovations, Inc.; **Jim Coddington,** Museum of Modern Art; **Anna Bentkowska-Kafel,** King's College London (United Kingdom)

*Program Committee:* **Ingrid Daubechies,** Princeton Univ.; **Charles R. Dyer,** Univ. of Wisconsin-Madison; **Roger L. Easton, Jr.,** Rochester Institute of Technology; **Daniel J. Graham,** Dartmouth College; **Ella Hendriks,** Van Gogh Museum (Netherlands); **Shannon M. Hughes,** Univ. of Colorado at Boulder; **Mohammad Tanvir Irfan,** Stony Brook Univ.; **Siwei Lyu,** New York Univ. at Albany; **Kirk Martinez,** Univ. of Southampton (United Kingdom); **Eric O. Postma,** Univ. van Tilburg (Netherlands); **Daniel N. Rockmore,** Dartmouth College; **Robert Sablatnig,** Technische Univ. Wien (Austria); **Ron Spronk,** Queen's Univ. (Canada); **Filippo D. Stanco,** Univ. degli Studi di Catania (Italy); **David M. Stone,** Univ. of Delaware; **Song-Chun Zhu,** Univ. of California, Los Angeles

## Tuesday 25 January

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Time and order estimation of paintings based on expert priors: applications in art history and curatorial treatment**, Ricardo S. Cabral, João P. Costeira, Univ. Técnica de Lisboa (Portugal); Fernando de La Torre, Carnegie Mellon Univ. (United States); Alexandre Bernardino, Gustavo Carneiro, Univ. Técnica de Lisboa (Portugal) . . . . . .[7869-15]

**Machine learning of multi-feature visual texture classifiers for the authentication of Jackson Pollock's drip paintings**, Mahmoud Al-Ayyoub, Stony Brook Univ. (United States); David G. Stork, Ricoh Innovations, Inc. (United States); Mohammad Tanvir Irfan, Stony Brook Univ. (United States) . . . . . .[7869-17]

**Improved curvature-based inpainting applied to fine art: recovering van Gogh's partially hidden brush strokes**, David G. Stork, Ricoh Innovations, Inc. (United States); Yubin Kuang, Fredrik Kahl, Lund Univ. (Sweden) . . . . . .[7869-18]

**Did Caravaggio employ optical projections? An image analysis of the parity in the artist's paintings**, David G. Stork, Ricoh Innovations, Inc. (United States). . . . . .[7869-19]

**A computer graphics reconstruction and optical analysis of scale anomalies in Caravaggio's "Supper at Emmaus"**, David G. Stork, Ricoh Innovations, Inc. (United States); Yasuo Furuichi, Consultant (Japan). . . . . .[7869-20]

**Image analysis of the underdrawings in Lorenzo Lotto's "Husband and wife"**, David G. Stork, Ricoh Innovations, Inc. (United States); Alexander J. Kossolapov, State Hermitage Museum (Russian Federation). . . .[7869-21]

**Automated classification of quilt photographs into crazy and non-crazy**, Alhaad Gokhale, Indian Institute Of Technology, Kharagpur (India); Peter Bajcsy, Univ. of Illinois at Urbana-Champaign (United States) . . . . . .[7869-22]

**Polarized light scanning for cultural heritage investigation**, Jay Arre O. Toque, Yusuke Murayama, Ari Ide-Ektessabi, Kyoto Univ. (Japan)[7869-23]

**After digital cleaning: visualization of dirt layer**, Maricor N. Soriano, Cherry May Palomero, Univ. of the Philippines (Philippines) . . . .[7869-24]

## Wednesday 26 January

**Grand Peninsula Ballroom A. . . . . Wed. 8:20 to 9:20 am**

### Plenary Session and Conference Award Presentations

8:25 am: **Problems in Biological Imaging: Opportunities for Signal Processing**, Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[EI11SE-102]

## SESSION 1

**Bayside Room A. . . . . Wed. 9:30 to 10:30 am**

### Looking Inside the Painting

*Session Chair*: **David G. Stork,** Ricoh Innovations, Inc.

9:30 am: **Documenting Van Eycks' *Ghent Altarpiece:* field work experiences from the crypt,** Ron Spronk, Queen's Univ. (Canada) and Radboud Univ. Nijmegen (Netherlands) . . . . . .[7869-01]

10:10 am: **Computer analysis of lighting style in fine art: an inter-artist study**, David G. Stork, Ricoh Innovations, Inc. (United States) . .[7869-02]

Coffee Break . . . . . .10:30 to 11:10 am

## SESSION 2

**Bayside Room A. . . . . Wed. 11:10 am to 12:30 pm**

### Semantic Classifications, Iconography, and CBIR

*Session Chair*: **Anna Bentkowska-Kafel,** King's College London (United Kingdom)

11:10 am: **The automatic annotation and retrieval of digital images of prints and tile panels using network link analysis algorithms**, Gustavo Carneiro, João P. Costeira, Univ. Técnica de Lisboa (Portugal) . .[7869-03]

11:30 am: **Explaining scene composition using kinematic chains of humans: application to Portuguese tiles history**, Nuno P. da Silva, Manuel Marques, Gustavo Carneiro, João P. Costeira, Univ. Técnica de Lisboa (Portugal) . . . . . .[7869-04]

11:50 am: **Top-down analysis of low-level object relatedness leading to semantic understanding of medieval image collections**, Pradeep Yarlagadda, Juan Antonio Monroy, Bernd Carque, Bjoern Ommer, UniversitätsKlinikum Heidelberg (Germany) . . . . . .[7869-05]

12:10 pm: **A framework for analysis of large database of old art paintings**, Jérôme Da Rugna, Gaël Chareyron, Pôle Univ. Léonard de Vinci (France) . . . . . .[7869-06]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 3

**Bayside Room A. . . . . Wed. 2:00 to 3:20 pm**

### Image Acquisition and Processing

2:00 pm: **Image fusion for art analysis**, Barbara Zitova, Miroslav Beneš, Jan Blažek, Institute of Information Theory and Automation (Czech Republic) . . . . . .[7869-07]

2:20 pm: **Recovery of handwritten text from the diaries and papers of David Livingstone**, Keith T. Knox, Air Force Research Lab. (United States); Roger L. Easton, Jr., Rochester Institute of Technology (United States); William A. Christens-Barry, Equipoise Imaging, LLC (United States); Kenneth Boydston, Megavision Inc. (United States). . . . . .[7869-08]

2:40 pm: **Automation of digital historical map analyses**, Tenzing Shaw, Peter Bajcsy, Univ. of Illinois at Urbana-Champaign (United States) . . . . . .[7869-09]

3:00 pm: **Automatic multispectral ultraviolet, visible and near-infrared capturing system for the study of artwork**, Jorge A. Herrera-Ramirez, Meritxell Villaseca, Jaume Pujol, Univ. Politècnica de Catalunya (Spain) . . . . . .[7869-16]

Coffee Break . . . . . 3:20 to 4:00 pm

## SESSION 4

**Bayside Room A. . . . . Wed. 4:00 to 5:20 pm**

### Visualization, Documentation, and Art Restoration

*Session Chair*: **James Coddington,** Museum of Modern Art

4:00 pm: **Automatic registration of multi-band reflectance and luminescence images**, Damon Conover, The George Washington Univ. (United States); John Delaney, National Gallery of Art (United States); Murray Loew, The George Washington Univ. (United States). . . .[7869-11]

4:20 pm: **Art documentation quality in function of 3D scanning resolution and precision**, Eryk Bunsch, Museum Palace at Wilanow (Poland); Robert Sitnik, Warsaw Univ. of Technology (Poland) . .[7869-12]

4:40 pm: **Investigation of the degradation mechanism and discoloration of traditional Japanese pigments by multispectral imaging**, Jay Arre O. Toque, Ari Ide-Ektessabi, Kyoto Univ. (Japan) . . . . . .[7869-13]

5:00 pm: **Improved methods for dewarping images in convex mirrors in fine art: applications to van Eyck and Parmigianino**, Yumi Usami, Waseda Univ. (Japan); David G. Stork, Ricoh Innovations, Inc. (United States); Jun Fujiki, National Institute of Advanced Industrial Science and Technology (Japan); Hideitsu Hino, Waseda Univ. (Japan); Shotaro Akaho, National Institute of Advanced Industrial Science and Technology (Japan); Noboru Murata, Waseda Univ. (Japan) . . . . . .[7869-14]

# Conference 7870

Monday-Tuesday 24-25 January 2011 • Proceedings of SPIE Vol. 7870

# Image Processing: Algorithms and Systems IX

*Conference Chairs:* **Jaakko T. Astola,** Tampere Univ. of Technology (Finland); **Karen O. Egiazarian,** Tampere Univ. of Technology (Finland

*Program Committee:* **Til Aach,** RWTH Aachen (Germany); **Sos S. Agaian,** The Univ. of Texas at San Antonio; **Junior Barrera,** Univ. de São Paulo (Brazil); **Reiner Creutzburg,** Fachhochschule Brandenburg (Germany); **Paul Gader,** Univ. of Florida; **Atanas P. Gotchev,** Tampere Univ. of Technology (Finland); **John C. Handley,** Xerox Corp.; **Vladimir V. Lukin,** National Aerospace Univ. (Ukraine); **Stephen Marshall,** Univ. of Strathclyde (United Kingdom); **Alessandro Neri,** Univ. degli Studi di Roma Tre (Italy); **Françoise J. Prêteux,** TELECOM & Management SudParis (France); **Giovanni Ramponi,** Univ. degli Studi di Trieste (Italy); **Jagath K. Samarabandu,** The Univ. of Western Ontario (Canada); **Akira Taguchi,** Musashi Institute of Technology (Japan)

## Monday 24 January

### SESSION 1

**Sandpebble Room E . . . . . Mon. 8:30 to 10:10 am**

#### Image Filtering and Enhancement

*Session Chair*: **Karen O. Egiazarian,** Tampere Univ. of Technology (Finland)

8:30 am: **An adaptive optimization of the polynomial wavelet threshold**, David Akopian, Sushanth G. Sathyanarayana, Sos S. Agaian, The Univ. of Texas at San Antonio (United States) . . . . . .[7870-01]

8:50 am: **Video denoising using separable 4D nonlocal spatiotemporal transforms**, Matteo T. Maggioni, Tampere Univ. of Technology (Finland); Giacomo Boracchi, Politecnico di Milano (Italy); Alessandro Foi, Karen O. Egiazarian, Tampere Univ. of Technology (Finland) . . . . . .[7870-02]

9:10 am: **Intelligent edge enhancement using multilayer neural network based on multi-valued neurons**, Igor N. Aizenberg, Shane Alexander, Jacob T. Jackson, Thomas Neal, Jeffrey Wilson, Kristi Kendrick, Texas A&M Univ.-Texarkana (United States) . . . . . .[7870-03]

9:30 am: **New loss functions for ordered hypothesis machines**, Reid B. Porter, Los Alamos National Lab. (United States). . . . . .[7870-04]

9:50 am: **Signal filtering of daily cloud types trends as derived from satellites images**, Jules R. Dim, Hiroshi Murakami, Japan Aerospace Exploration Agency (Japan). . . . . .[7870-05]

Coffee Break . . . . . .10:10 to 10:50 am

### SESSION 2

**Sandpebble Room E . . . . . Mon. 10:50 am to 12:30 pm**

#### Image Analysis

*Session Chair*: **Jaakko T. Astola,** Tampere Univ. of Technology (Finland)

10:50 am: **Analysing wear in carpets by detecting varying local binary patterns**, Sergio A. Orjuela Vargas, Ewout Vansteenkiste, Filip Rooms, Simon De Meulemeester, Robin De Keyser, Wilfried R. Philips, Univ. Gent (Belgium) . . . . . .[7870-06]

11:10 am: **Line and streak detection on polished and textured surfaces using line integrals**, Mustafa S. Erkilinc, Mustafa Jaber, Eli Saber, Rochester Institute of Technology (United States) . . . . . .[7870-07]

11:30 am: **Detecting photographic and computer-generated composites**, Valentina Conotter, Mattia Broilo, Lorenzo Cordin, Univ. degli Studi di Trento (Italy) . . . . . .[7870-08]

11:50 am: **Spatio-temporal analysis and forward modelling of solar polar plumes in white light**, Antoine Llebaria, Olivier Morillot, Observatoire Astronomique de Marseille-Provence (France) . . . .[7870-09]

12:10 pm: **Imaging using synchrotron radiation for forensic science**, Federico M. Cervelli, Sergio Carrato, Univ. degli Studi di Trieste (Italy); Aldo Mattei, Rep. Investigazioni Scientifiche (Italy); Martino Jerian, Amped SRL - P.I. (Italy); Luca Benevoli, Lucia Mancini, Franco Zanini, Lisa Vaccari, Andrea Perucchi, Giuliana Aquilanti, Sincrotrone Trieste S.C.p.A. (Italy) . . . . . .[7870-10]

Lunch Break . . . . . 12:30 to 2:00 pm

### SESSION 3

**Sandpebble Room E . . . . . Mon. 2:00 to 3:20 pm**

#### Image Segmentation and Classification

*Session Chair*: **Sos S. Agaian,** The Univ. of Texas at San Antonio

2:00 pm: **PSO-based methods for medical image registration and change assessment of pigmented skin**, Steve T. Kacenjar, Lockheed Martin Corp. (United States); Matthew Zook, Fox Chase Cancer Ctr. (United States); Michael Balint, Lockheed Martin Corp. (United States) . . . . . .[7870-11]

2:20 pm: **Image-based segmentation for characterization and quantitative analysis of the spinal cord injuries by using diffusion patterns**, Markus Hannula, Adeola Olubamiji, Tampere Univ. of Technology (Finland); Iivari Kunttu, Nokia Research Ctr. (Finland); Prasun Dastidar, Tampere Univ. Hospital (Finland); Jari Hyttinen, Tampere Univ. of Technology (Finland) . . . . . .[7870-12]

2:40 pm: **Descreening using segmentation-based adaptive filtering**, Mohamed N. Ahmed, Ahmed H. Eid, Lexmark International, Inc. (United States) . . . . . .[7870-13]

3:00 pm: **Novel parametric priors for the distribution of multivariate linear prediction errors**, Imtnan-Ul-Haque Qazi, Olivier Alata, Univ. de Poitiers (France); Jean-Christophe Burie, Univ. de La Rochelle (France); Ahmed Moussa, Abdelmalek Essaadi Univ. (Morocco); Christine Fernandez-Maloigne, Univ. de Poitiers (France) . . . . . .[7870-14]

Coffee Break . . . . . 3:20 to 4:00 pm

### SESSION 4

**Sandpebble Room E . . . . . Mon. 4:00 to 5:00 pm**

#### Image Transforms and Applications

*Session Chair*: **Alessandro Neri,** Univ. degli Studi di Roma Tre (Italy)

4:00 pm: **Secure annotation for medical images based on reversible watermarking in the Integer Fibonacci Haar transform**, Federica Battisti, Marco Carli, Alessandro Neri, Univ. degli Studi di Roma Tre (Italy) . . . . . .[7870-16]

4:20 pm: **Multi-seam carving via seamlets**, David D. Conger, Michigan State Univ. (United States); Mrityunjay Kumar, Eastman Kodak Co. (United States); Hayder Radha, Michigan State Univ. (United States) . . .[7870-17]

4:40 pm: **A new DCT-based algorithm for numerical reconstruction of electronically recorded holograms**, Leonid Bilevich, Leonid Yaroslavsky, Tel Aviv Univ. (Israel) . . . . . .[7870-18]

## Tuesday 25 January

**Grand Peninsula Ballroom A . . . . . Tues. 8:20 to 9:20 am**

### Plenary Session and Society Award Presentations

8:25 am: **New Dimensions in Visual Quality**, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

## SESSION 5

**Sandpebble Room E . . . . . Tues. 9:50 to 10:30 am**

### Image Processing Systems

*Session Chair*: **Reiner Creutzburg,** Fachhochschule Brandenburg (Germany)

9:50 am: **User discrimination in automotive systems**, Andrey Makrushin, Jana Dittmann, Otto-von-Guericke-Univ. Magdeburg (Germany); Claus Vielhauer, Fachhochschule Brandenburg (Germany) and Otto-von-Guericke-Univ. Magdeburg (Germany); Marcus Leich, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . . . .[7870-20]

10:10 am: **Study of radar system imaging with distributed architecture**, Liqing Lei, Jingshan Jiang, Ctr. for Space Science and Applied Research (China) . . . . . .[7870-21]

Coffee Break . . . . . .10:30 to 11:10 am

## SESSION 6

**Sandpebble Room E . . . . . .Tues. 11:10 am to 12:10 pm**

### Image Interpolation and Reconstruction

*Session Chair*: **Karen O. Egiazarian,** Tampere Univ. of Technology (Finland)

11:10 am: **Wiener crosses borders: interpolation based on second order models**, Alvaro Guevara, Rudolf Mester, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany). . . . . .[7870-22]

11:30 am: **Image interpolation based on a multi-resolution directional map**, Eric Van Reeth, STMicroelectronics (France); Pascal Bertolino, Gipsa-lab (France); Marina M. Nicolas, STMicroelectronics (France) . . . . . .[7870-23]

11:50 am: **Images reconstruction using modified exemplar based method**, Viatcheslav V. Voronin, South-Russian State Univ. of Economics and Service (Russian Federation) and Tampere Univ. of Technology (Finland); Vladimir I. Marchuk, South-Russian State Univ. of Economics and Service (Russian Federation); Karen O. Egiazarian, Tampere Univ. of Technology (Finland) . . . . . .[7870-24]

Lunch Break . . . . . 12:10 to 2:00 pm

## SESSION 7

**Sandpebble Room E . . . . . Tues. 2:00 to 3:00 pm**

### Image Representation

*Session Chair*: **Marco Carli,** Univ. degli Studi di Roma Tre (Italy)

2:00 pm: **A graph non-tree representation of the topology of a gray scale image**, Peter Saveliev, Marshall Univ. (United States) . . . .[7870-25]

2:20 pm: **Colour processing in Runge space**, Alfredo Restrepo, Univ. de Los Andes (Colombia) . . . . . .[7870-26]

2:40 pm: **Robust image registration for multiple exposure high dynamic range image synthesis,** Susu Yao, Institute for Infocomm Research (Singapore) . . . . . .[7870-27]

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

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**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Efficiency analysis of DCT-based filters for color image database**, Vladimir V. Lukin, Dmitriy V. Fevralev, Sergey K. Abramov, Nikolay N. Ponomarenko, National Aerospace Univ. (Ukraine); Jaakko T. Astola, Karen O. Egiazarian, Tampere Univ. of Technology (Finland) . . . . . .[7870-28]

**Color image lossy compression based on blind evaluation and prediction of noise characteristics**, Vladimir V. Lukin, Nikolay N. Ponomarenko, National Aerospace Univ. (Ukraine); Karen O. Egiazarian, Tampere Univ. of Technology (Finland); Leena Lepisto, Nokia Research Ctr. (Finland) . . . . . .[7870-29]

**Unsupervised automated panorama creation for realistic surveillance scenes through weighted mutual information registration**, Thomas P. Keane, Eli Saber, Harvey E. Rhody, Andreas E. Savakis, Rochester Institute of Technology (United States); Jeffrey Raj, Lenel Systems International Inc. (United States). . . . . .[7870-30]

**Ellipse detection using an improved randomized Hough transformation**, Zhu Teng, Jeong-Hyun Kim, Dong-Joong Kang, Pusan National Univ. (Korea, Republic of) . . . . . .[7870-31]

**Detection of motion blur direction based on maxima locations for blind deconvolution**, Rachel M. Chong, Toshihisa Tanaka, Tokyo Univ. of Agriculture and Technology (Japan) . . . . . .[7870-32]

**EM algorithm-based hyperparameters estimator for Bayesian image denoising using BKF prior**, Larbi Boubchir, Bruno Durning, Eric Petit, Univ. Paris 12 - Val de Marne (France) . . . . . .[7870-33]

**Semantic analysis of facial gestures from video using a Bayesian framework**, Gati Vashi, Roxanne L. Canosa, Rochester Institute of Technology (United States) . . . . . .[7870-34]

**Color image enhancement algorithm based on logarithmic transform coefficient histogram shifting**, Junjun Xia, Karen A. Panetta, Tufts Univ. (United States); Sos S. Agaian, The Univ. of Texas at San Antonio (United States) . . . . . .[7870-35]

**Neighbourhood-consensus message passing and its potentials in image processing applications**, Tijana Ruzic, Aleksandra Pizurica, Wilfried R. Philips, Univ. Gent (Belgium) . . . . . .[7870-36]

**Alternative method for Hamilton-Jacobi PDEs in image processing**, Corinne Vachier-Mammar, Aurélie Lagoutte, Hadrien Salat, Ecole Normale Supérieure de Cachan (France). . . . . .[7870-37]

# Conference 7871

Monday-Tuesday 24-25 January 2011 • Proceedings of SPIE Vol. 7871

# Real-Time Image and Video Processing 2011

*Conference Chairs:* **Nasser Kehtarnavaz,** The Univ. of Texas at Dallas; **Matthias F. Carlsohn,** Computer Vision and Image Communication at Bremen (Germany)

*Program Committee:* **Mohamed Akil,** École Supérieure d'Ingénieurs en Electronique et Electrotechnique (France); **Philip P. Dang,** STMicroelectronics; **Barak Fishbain,** Univ. of California, Berkeley; **Mark N. Gamadia,** Texas Instruments Inc.; **Pierre Graebling,** Ecole Nationale Supérieure de Physique de Strasbourg (France); **Christos Grecos,** Univ. of the West of Scotland (United Kingdom); **Sergio R. Goma,** Qualcomm Inc.; **Rastislav Lukac,** Epson Canada Ltd. (Canada); **Lindsay William MacDonald,** London College of Communication (United Kingdom); **Mehrube Mehrübeoglu,** Texas A&M Univ. Corpus Christi; **Volodymyr I. Ponomaryov,** Instituto Politécnico Nacional (Mexico); **Fatih Porikli,** Mitsubishi Electric Research Labs.; **Luis Salgado,** Univ. Politécnica de Madrid (Spain); **Jorge Santos,** European Commission (Belgium); **Mukul V. Shirvaikar,** The Univ. of Texas at Tyler; **Stephan C. Stilkerich,** EADS Deutschland GmbH (Germany); **Shan Suthaharan,** University of North Carolina at Greensboro; **Leonid Yaroslavsky,** Tel Aviv Univ. (Israel)

## Monday 24 January

### SESSION 1

**Bayside Room B. . . . . Mon. 8:20 to 10:20 am**

#### Real-Time Algorithms/Systems I

*Session Chair*: **Nasser Kehtarnavaz,** The Univ. of Texas at Dallas

8:20 am: **Towards real-time image quality assessment** *(Invited Paper)*, Bobby Geary, Christos Grecos, Univ. of the West of Scotland (United Kingdom) . . . . . .[7871-01]

8:50 am: **2000 fps real-time target tracking vision system based on color histogram**, Idaku Ishii, Tetsuro Tatebe, Qingyi Gu, Takeshi Takaki, Hiroshima Univ. (Japan) . . . . . .[7871-02]

9:10 am: **Real-time iris tracking with a smart camera**, Mehrube Mehrübeoglu, Ha Thi Bui, Texas A&M Univ. Corpus Christi (United States); Lifford McLauchlan, Texas A&M Univ.-Kingsville (United States).[7871-03]

9:30 am: **Optimization of image processing algorithms on mobile platforms** *(Invited Paper)*, Mukul V. Shirvaikar, Pramod Poudel, The Univ. of Texas at Tyler (United States) . . . . . .[7871-05]

Coffee Break . . . . . .10:00 to 10:40 am

### SESSION 2

**Bayside Room B. . . . . Mon. 10:40 am to 12:40 pm**

#### Real-Time Implementation/Hardware

*Session Chair*: **Christos Grecos,** Univ. of the West of Scotland (United Kingdom)

10:40 am: **Scalable software architecture for on-line multicamera video processing** *(Invited Paper)*, Massimo Camplani, Luis Salgado, Univ. Politécnica de Madrid (Spain) . . . . . .[7871-06]

11:10 am: **Real-time implementation of logo detection on open source BeagleBoard**, Mel K. George, Nasser Kehtarnavaz, The Univ. of Texas at Dallas (United States); Leonardo W. Estevez, Texas Instruments Inc. (United States). . . . . .[7871-07]

11:30 am: **Image orientation detection for real-time implementation on embedded devices**, Vikram V. Appia, Georgia Institute of Technology (United States); Rajesh Narasimha, Texas Instruments Inc. (United States) . . . . . .[7871-08]

11:50 am: **Real-time topological image smoothing on shared memory parallel machines**, Ramzi Mahmoudi, Mohamed Akil, Ecole Supérieure d'Ingénieurs en Electronique et Electrotechnique (France). . . . . .[7871-09]

12:10 pm: **Multithreaded real-time 3D image processing software architecture and implementation** *(Invited Paper)*, Vikas Ramachandra, Kalin Atanassov, Milivoje Aleksic, Sergio R. Goma, Qualcomm Inc. (United States) . . . . . .[7871-10]

Lunch Break . . . . . 12:40 to 1:50 pm

### SESSION 3

**Bayside Room B. . . . . Mon. 1:50 to 3:30 pm**

#### Real-Time Video

*Session Chair*: **Mohamed Akil,** École Supérieure d'Ingénieurs en Electronique et Electrotechnique (France)

1:50 pm: **Real-time video streaming using H.264 scalable video coding (SVC) in multihomed mobile networks: a testbed approach** *(Invited Paper)*, James M. Nightingale, Qi Wang, Christos Grecos, Univ. of the West of Scotland (United Kingdom) . . . . . .[7871-11]

2:20 pm: **A new bitstream structure for parallel CAVLC decoding**, Yun-Gu Lee, Kyunghwan Cho, Samsung Electronics Co., Ltd. (Korea, Republic of) . . . . . .[7871-12]

2:40 pm: **3D video sequence reconstruction algorithms implemented on DSP**, Volodymyr I. Ponomaryov, Eduardo Ramos-Diaz, Instituto Politécnico Nacional (Mexico) . . . . . .[7871-13]

3:00 pm: **Real-time patch sweeping for high-quality depth estimation in 3D videoconferencing applications** *(Invited Paper)*, Wolfgang Waizenegger, Ingo Feldmann, Oliver Schreer, Fraunhofer-Institut für Nachrichtentechnik Heinrich-Hertz-Institut (Germany) . . . . . .[7871-14]

Coffee Break . . . . . 3:30 to 3:50 pm

## SESSION 4

**Bayside Room B. . . . . Mon. 3:50 to 5:20 pm**

### Real-Time Algorithms/Systems II

*Session Chair*: **Matthias F. Carlsohn,** Computer Vision and Image Communication at Bremen (Germany)

3:50 pm: **Real-time scene change detection assisted with camera 3A: auto exposure, auto white balance, and auto focus** *(Invited Paper)*, Liang Liang, Bob Hung, Ying Noyes, Ruben Velarde, QUALCOMM MEMS Technologies, Inc. (United States). . . . . .[7871-15]

4:20 pm: **Fast approximate 4D:3D discrete radon transform, from light field to focal stack with O(N^4) sums**, Jose G. Marichal-Hernandez, Jonás P. Lüke, Fernando L. Rosa, Jose M. Rodriguez-Ramos, Univ. de La Laguna (Spain). . . . . .[7871-16]

4:40 pm: **A cross-based filter for fast edge-preserving smoothing**, Ke Zhang, IMEC (Belgium) and Katholieke Univ. Leuven (Belgium); Jiangbo Lu, Advanced Digital Sciences Ctr. (Singapore); Gauthier Lafruit, Rudy Lauwereins, IMEC (Belgium); Luc J. Van Gool, Katholieke Univ. Leuven (Belgium) . . . . . .[7871-17]

5:00 pm: **Human action recognition in a wide and complex environment**, Sanoj Kumar, Indian Institute of Technology Roorkee (India); Sanjeev Kumar Malik, Univ. degli Studi di Udine (Italy); Balasubramanian Raman, Nagarajan Sukavanam, Indian Institute of Technology Roorkee (India). . . . . .[7871-18]

## Tuesday 25 January

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Image data compression based on transform union**, Xiteng Liu, McMaster Univ. (Canada) . . . . . .[7871-19]

**Swimming behavior detection for Nitocra Spinipes in water quality evaluation**, Zongpu Jia, Weixing Wang, Henan Polytechnic Univ. (China) . . . . . .[7871-20]

**Human heart movement tracing on ultrasonic images**, Xiuzhi Yang, Fuzhou Univ. (China) . . . . . .[7871-21]

**Efficient object tracking in WAAS data streams**, Trevor R. Clarke, Ball Aerospace & Technologies Corp. (United States) and Rochester Institute of Technology (United States) . . . . . .[7871-22]

**How fast can one numerically reconstruct digitally recorded holograms?**, Leonid Bilevich, Leonid Yaroslavsky, Tel Aviv Univ. (Israel) . . . . . .[7871-23]

**Tracking flow of leukocytes in blood for drug analysis**, Arslan Basharat, Wesley D. Turner, Kitware, Inc. (United States); Gillian Stephens, Benjamin Badillo, Rick Lampkin, Patrick Andre, Portola Pharmaceuticals Inc. (United States); Amitha Perera, Kitware, Inc. (United States) . . . . . .[7871-24]

**Phase correlation based adaptive mode decision for the H.264/ AVC**, Abdelrahman Abdelazim, Stephen Mein, Martin R. Varley, Univ. of Central Lancashire (United Kingdom); Christos Grecos, Univ. of the West of Scotland (United Kingdom); Djamel Ait-Boudaoud, Univ. of Portsmouth (United Kingdom). . . . . .[7871-25]

**Fast multilayered prediction algorithm for group of pictures in H.264/ SVC**, Abdelrahman Abdelazim, Stephen Mein, Martin R. Varley, Univ. of Central Lancashire (United Kingdom); Christos Grecos, Univ. of the West of Scotland (United Kingdom); Djamel Ait-Boudaoud, Univ. of Portsmouth (United Kingdom). . . . . .[7871-26]

**X-Eye: a novel wearable vision system**, Yuan-Kai Wang, Ching-Tang Fan, Shao-Ang Chen, Hou-Ye Chen, Fu-Jen Catholic Univ. (Taiwan) . . . . . .[7871-27]

**Real-time vehicle matching for multi-camera tunnel surveillance**, Vedran Jelaca, Jorge Oswaldo Nino-Castaneda, Andres Frias-Velazquez, Aleksandra Pizurica, Wilfried R. Philips, Univ. Gent (Belgium) . . .[7871-28]

**Differential coding of intra modes for high efficiency video coding**, Ehsan Maani, Sony Electronics Inc. (United States); Wei Liu, Hangzhou Dianzi Univ. (China) . . . . . .[7871-29]

# Conference 7872

Monday-Tuesday 24-25 January 2011 • Proceedings of SPIE Vol. 7872

# Parallel Processing for Imaging Applications

*Conference Chairs:* **John D. Owens,** Univ. of California, Davis; **I-Jong Lin,** Hewlett-Packard Labs.; **Yu-Jin Zhang,** Tsinghua Univ. (China)

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

*Cosponsored by:*

## Monday 24 January

**Sandpebble Room D . . . . . Mon. 8:20 to 8:30 am**

### Welcome

**Gary J. Dispoto,** Hewlett-Packard Labs. (United States)

## SESSION 1

**Sandpebble Room D . . . . . Mon. 8:30 to 10:20 am**

### Parallel Imaging Systems

*Session Chair*: **Erwin Oertli,** NVIDIA Corp.

8:30 am: **Using a commercial graphical processing unit (GPU) and the CUDA programming language to accelerate image processing applications**, Randy P. Broussard, Robert Ives, U.S. Naval Academy (United States) . . . . . .[7872-01]

8:50 am: **Automatic distribution of vision-tasks on computing clusters**, Thomas Müller, Alois Knoll, Technische Univ. München (Germany) . . . . . .[7872-02]

9:10 am: **Highly scalable digital front end architectures for digital publishing**, David Staas, Hewlett-Packard Co. (United States) . .[7872-03]

9:30 am: **Parallel training and testing methods for complex image processing algorithms on distributed, heterogeneous, unreliable, and non-dedicated resources**, Rubén Usamentiaga, Daniel F. García, Julio Molleda, Ignacio Sainz, Francisco G. Bulnes, Univ. de Oviedo (Spain) . . . . . .[7872-04]

9:50 am: **Integrated parallel printing systems with hypermodular architecture** *(Invited Paper)*, David K. Biegelsen, Lara Crawford, Craig Eldershaw, Markus Fromherz, Palo Alto Research Center, Inc. (United States); Greg Kott, Barry Mandel, Steven Moore, Xerox Corporation (United States); Bryan Preas, Lars Swartz, Palo Alto Research Center, Inc. (United States) . . . . . .[7872-05]

Coffee Break . . . . . .10:20 to 10:40 am

## SESSION 2

**Sandpebble Room D . . . . . Mon. 10:40 am to 12:30 pm**

### From Image to Structure I

*Session Chair*: **Robert A. Ulichney,** Hewlett-Packard Labs.

10:40 am: **Parallel processing considerations for image recognition tasks** *(Invited Paper)*, Steven J. Simske, Hewlett-Packard Labs. (United States) . . . . . .[7872-06]

11:10 am: **GPGPU real-time texture analysis framework**, Moulay A. Akhloufi, Ctr. of Robotics and Vision (Canada) and Laval Univ. (Canada) . . . . . .[7872-07]

11:30 am: **A parallel implementation of 3D Zernike moment analysis**, Daniel Berjón, Sergio Arnaldo, Francisco Morán, Univ. Politécnica de Madrid (Spain) . . . . . .[7872-08]

11:50 am: **A novel parallel algorithm for airport runway segmentation in satellite images using priority-directional region growing strategy based on ensemble learning**, Fei Duan, Yu-Jin Zhang, Tsinghua Univ. (China) . . . . . .[7872-09]

12:10 pm: **Visualization assisted by parallel processing**, Benoit Lange, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France); Xavier Vasques, Hervé Rey, IBM (France); Nancy Rodriguez, William Puech, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France) . . . . . .[7872-10]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 3

**Sandpebble Room D . . . . . Mon. 2:00 to 2:20 pm**

### From Image to Structure II

*Session Chair*: **Robert A. Ulichney,** Hewlett-Packard Labs.

2:00 pm: **A parallel impulse-noise detection algorithm based on ensemble learning for switching median filters**, Fei Duan, Yu-Jin Zhang, Tsinghua Univ. (China) . . . . . .[7872-11]

## SESSION 4

**Sandpebble Room D . . . . . Mon. 2:20 to 3:20 pm**

### From Structure to Image I

*Session Chair*: **Yu-Jin Zhang,** Tsinghua Univ. (China)

2:20 pm: **GPU color space conversion**, Gary L. Vondran, Jr., Patrick Chase, Hewlett-Packard Co. (United States) . . . . . .[7872-12]

2:40 pm: **Acceleration of the Retinex algorithm for image restoration by GPGPU/CUDA**, Yuan-Kai Wang, Wen-Bin Huang, Fu-Jen Catholic Univ. (Taiwan) . . . . . .[7872-13]

3:00 pm: **Performance evaluation of Canny edge detection on a tiled multicore architecture**, Andrew Z. Brethorst, Nehal Desai, Douglas Enright, Ronald Scrofano, The Aerospace Corp. (United States) .[7872-14]

Coffee Break . . . . . 3:20 to 3:50 pm

**Sandpebble Room D . . . . . Mon. 3:50 to 5:30 pm**

### Industry Panel on Future Directions in Parallel Processing

*Panel Moderator*: **John D. Owens,** Univ. of California, Davis

*Panel Members:*

**Justin Hensley,** Advanced Micro Devices, Inc. (United States)

**Victor W. Lee,** Intel Corp.

**Joe Stam,** NVIDIA Corp.

## Tuesday 25 January

**Grand Peninsula Ballroom A. . . . . Tues. 8:20 to 9:20 am**

### Plenary Session and Society Award Presentations

8:25 am: **New Dimensions in Visual Quality**, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

## SESSION 5

**Sandpebble Room D . . . . . Tues. 9:30 to 10:30 am**

### From Structure to Image II

*Session Chair*: **Ngai-Man Cheung,** Stanford Univ.

9:30 am: **Video transcoding using GPU accelerated decoder**, Wei-Lien Hsu, Advanced Micro Devices, Inc. (United States) . . . . . .[7872-15]

9:50 am: **Real-time image deconvolution on the GPUs**, James T. Klosowski, Shankar Krishnan, AT&T Labs. Research (United States) . . . . . .[7872-16]

10:10 am: **Stitching giga pixel images using parallel computing**, Rob Kooper, Peter Bajcsy, Univ. of Illinois at Urbana-Champaign (United States) . . . . . .[7872-17]

Coffee Break . . . . . .10:40 to 11:20 am

## SESSION 6

**Sandpebble Room D . . . . . .Tues. 11:10 am to 12:10 pm**

### Speed vs. Accuracy Trade-off I

*Session Chair*: **Bill Buzbee,** Google Inc.

11:10 am: **GPU-completeness: concept and implications**, I-Jong Lin, Hewlett-Packard Labs. (United States) . . . . . .[7872-18]

11:30 am: **A parallel error diffusion implementation on a GPU**, Yao Zhang, Univ. of California, Davis (United States); John Recker, Robert A. Ulichney, Giordano B. Beretta, Ingeborg Tastl, I-Jong Lin, Hewlett-Packard Labs. (United States); John D. Owens, Univ. of California, Davis (United States) . . . . . .[7872-20]

11:50 am: **Optimization of imaging algorithms on multiple core CPUs**, Richard J. Moore, 3M Co. (United States) . . . . . .[7872-21]

Lunch Break . . . . . 12:10 to 2:00 pm

## SESSION 7

**Sandpebble Room D . . . . . Tues. 2:00 to 2:40 pm**

### Speed vs. Accuracy Trade-off II

*Session Chair*: **Bill Buzbee,** Google Inc.

2:00 pm: **Evaluation of CPU and GPU architectures for spectral image analysis algorithms**, Virginie Fresse, Univ. Jean Monnet Saint-Etienne (France); Dominique Houzet, Gipsa-lab (France); Christophe Gravier, Telecom Saint Etienne (France). . . . . .[7872-22]

2:20 pm: **Computational scalability of large size image dissemination**, Rob Kooper, Peter Bajcsy, Univ. of Illinois at Urbana-Champaign (United States) . . . . . .[7872-23]

## SESSION 8

**Sandpebble Room D . . . . . Tues. 2:40 to 5:00 pm**

### Imaging Applications

*Session Chair*: **Mei Han,** Google Inc.

2:40 pm: **Real-time 3D flash ladar imaging through GPU data processing**, Chung M. Wong, Christopher Bracikowski, Brian Baldauf, Steven Havstad, Northrop Grumman Aerospace Systems (United States) . . . . . .[7872-25]

3:00 pm: **Advanced MRI reconstruction toolbox with accelerating on GPU**, Xiao-Long Wu, Yue Zhuo, Jiading Gai, Fan Lam, Maojing Fu, Justin P. Haldar, Wen-Mei Hwu, Zhi-Pei Liang, Bradley P. Sutton, Univ. of Illinois at Urbana-Champaign (United States) . . . . . .[7872-26]

Coffee Break . . . . . 3:20 to 4:00 pm

4:00 pm: **Accelerating image recognition on mobile devices using GPGPU**, Miguel Bordallo Lopez, Henri Nykänen, Jari Hannuksela, Olli J. Silvén, Univ. of Oulu (Finland); Markku Vehviläinen, Nokia Research Ctr. (Finland) . . . . . .[7872-27]

4:20 pm: **Multi-view stereo reconstruction via voxels clustering and parallel volumetric graph-cut optimization**, Yun-Feng Zhu, Yu-Jin Zhang, Tsinghua Univ. (China) . . . . . .[7872-28]

4:40 pm: **A GPU accelerated PDF transparency engine,** John Recker, I-Jong Lin, Ingeborg Tastl, Hewlett-Packard Labs. (United States)[7872-29]

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Infrared small target tracking based on SOPC**, Taotao Hu, Electronic Engineering Institute of Hefei (China); Xiang Fan, Univ. of Science and Technology of China (China); Yu-Jin Zhang, Tsinghua Univ. (China); Zheng-dong Chen, Bin Zhu, Electronic Engineering Institute of Hefei (China) . . . . . .[7872-30]

**A novel method for multi-view synthesis using relative affine structure**, Zhiyong Huo, Nanjing Univ. of Posts and Telecommunications (China) . . . . . .[7872-31]

# Conference 7873

Monday-Tuesday 24-25 January 2011 • Proceedings of SPIE Vol. 7873

# Computational Imaging IX

*Conference Chairs:* **Charles A. Bouman,** Purdue Univ.; **Ilya Pollak,** Purdue Univ.; **Patrick J. Wolfe,** Harvard Univ.

*Cosponsored by:* GE Healthcare

## Monday 24 January

**Oak Room . . . . . Mon. 8:20 to 8:50 am**

### Keynote Presentation I

8:20 am: **A tour of modern image processing**, Peyman Milanfar, Univ. of California, Santa Cruz (United States). . . . . .[7873-01]

## SESSION 2

**Oak Room . . . . . Mon. 8:50 to 11:10 am**

### Inverse Problems

8:50 am: **Myopic reconstruction and its application to MRFM data**, Se Un Park, Univ. of Michigan (United States); Nicolas Dobigeon, Univ. de Toulouse (France); Alfred O. Hero III, Univ. of Michigan (United States) . . . . . .[7873-02]

9:10 am: **Seismic imaging of transmission overhead line structure foundations**, Denis Vautrin, Institut de Recherche en Communications et en Cybernétique de Nantes (France); Matthieu Voorons, Ecole Polytechnique de Montréal (Canada); Jérôme Idier, Institut de Recherche en Communications et en Cybernétique de Nantes (France); Yves Goussard, Ecole Polytechnique de Montréal (Canada); Stéven Kerzalé, Apside Technologies (France); Nicolas Paul, EDF Recherche & Developpement (France) . . . . . .[7873-04]

9:30 am: **Inverse problems for cryo electron microscopy of viruses: randomly oriented projection images of random 3D structures in noise**, Qiu Wang, Peter C. Doerschuk, Cornell Univ. (United States) . . . . . .[7873-05]

9:50 am: **Inverse problems arising in different synthetic aperture radar imaging and a general Bayesian approach for them**, Sha Zhu, Ali Mohammad-Djafari, Lab. des Signaux et Systèmes (France). . . .[7873-06]

Coffee Break . . . . . .10:10 to 10:50 am

10:50 am: **Medical image enhancement using resolution synthesis**, Tak-Shing Wong, Charles A. Bouman, Purdue Univ. (United States); Jean-Baptiste Thibault, GE Healthcare (United States); Ken D. Sauer, Univ. of Notre Dame (United States) . . . . . .[7873-07]

## SESSION 3

**Oak Room . . . . . Mon. 11:10 am to 12:30 pm**

### Image and Video Analysis

11:10 am: **Joint pose estimation and image segmentation for monocular articulated tracking**, Landis M. Huffman, Ilya Pollak, Purdue Univ. (United States) . . . . . .[7873-46]

11:30 am: **An open level set framework for image segmentation and restoration using the Mumford and Shah model**, Rami Mohieddine, Luminita A. Vese, Univ. of California, Los Angeles (United States)[7873-08]

11:50 am: **Video indexing and retrieval using Fisher information nonlinear embedding**, Xu Chen, Alfred O. Hero III, Univ. of Michigan (United States). . . . . .[7873-09]

12:10 pm: **Segmentation assisted food classification for dietary assessment**, Fengqing Zhu, Marc Bosch, Tusa R. Schap, Nitin Khanna, David S. Ebert, Carol J. Boushey, Edward J. Delp III, Purdue Univ. (United States) . . . . . .[7873-10]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 4

**Oak Room . . . . . Mon. 2:00 to 2:20 pm**

### Image and Video Analysis II

2:00 pm: **Sparse Fisher linear discriminant analysis**, Hasib A. Siddiqui, Hau Hwang, Qualcomm Inc. (United States). . . . . .[7873-34]

## SESSION 5

**Oak Room . . . . . Mon. 2:20 to 3:40 pm**

### Imaging for Aerospace Applications

2:20 pm: **Shape-based segmentation of alloy micrographs using matching pursuits**, Landis M. Huffman, Ilya Pollak, Purdue Univ. (United States); Jeff P. Simmons, Air Force Research Lab. (United States); Marc De Graef, Carnegie Mellon Univ. (United States) . . . . . .[7873-35]

2:40 pm: **Characterization of moving dust particles**, Brent J. Bos, Scott R. Antonille, Nargess Memarsadeghi, NASA Goddard Space Flight Ctr. (United States). . . . . .[7873-13]

3:00 pm: **A super-resolution algorithm for enhancement of flash lidar data**, Alexander Bulyshev, Analytical Mechanics Associates, Inc. (United States); Michael D. Vanek, Farzin Amzajerdian, NASA Langley Research Ctr. (United States); Diego F. Pierrottet, Coherent Applications, Inc. (United States); Glenn D. Hines, Robert A. Reisse, NASA Langley Research Ctr. (United States). . . . . .[7873-14]

3:20 pm: **Image registration for stability testing of MEMS**, Nargess Memarsadeghi, Jacqueline Le Moigne, Peter N. Blake, NASA Goddard Space Flight Ctr. (United States); Peter A. Morey, Ball Aerospace & Technologies Corp. (United States); Wayne B. Landsman, Adnet Systems Inc. (United States); Victor J. Chambers, Samuel H. Moseley, NASA Goddard Space Flight Ctr. (United States) . . . . . .[7873-17]

Coffee Break . . . . . 3:40 to 4:00 pm

## SESSION 6

**Oak Room . . . . . Mon. 4:00 to 5:20 pm**

### Image Processing for Mobile Device Applications

4:00 pm: **Capacitive touch sensing: signal and image processing algorithms**, Zachi I. Baharav, Corning Inc. (United States); Ramakrishna Kakarala, Nanyang Technological Univ. (Singapore) . . . . . .[7873-18]

4:20 pm: **Denoising, deblurring, and super-resoluton in mobile phones**, Filip Sroubek, Jan Kamenicky, Jan Flusser, Institute of Information Theory and Automation (Czech Republic). . . . . .[7873-19]

4:40 pm: **Arabic word recognizer for mobile applications**, Nitin Khanna, Golnaz Abdollahian, Ben Brame, Mireille Boutin, Edward J. Delp III, Purdue Univ. (United States) . . . . . .[7873-20]

5:00 pm: **Volume estimation using food specific shape templates in mobile image-based dietary assessment**, Junghoon Chae, Insoo Woo, SungYe Kim, Ross Maciejewski, Fengqing Zhu, Edward J. Delp III, Carol J. Boushey, David S. Ebert, Purdue Univ. (United States) . . . . . .[7873-21]

## Tuesday 25 January

**Grand Peninsula Ballroom A . . . . . Tues. 8:20 to 9:20 am**

### Plenary Session and Society Award Presentations

8:25 am: New Dimensions in Visual Quality, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

**Oak Room . . . . . Tues. 9:30 to 10:00 am**

### Keynote Presentation II

9:30 am: **Medical x-ray computed tomography: past, present, and future**, Jiang Hsieh, GE Healthcare (United States) . . . . . .[7873-36]

## SESSION 8

**Oak Room . . . . . .Tues. 10:00 am to 12:30 pm**

### Special Session: Advance Methods in Tomographic Imaging I

*Session Chairs*: **Samit Basu,** Morpho Detection Inc.; **Charles A. Bouman,** Purdue Univ.

10:00 am: **Spectral x-ray CT imaging using energy sensitive photon counting detectors**, Katsuyuki Taguchi, The Johns Hopkins Outpatient Ctr. (United States) . . . . . .[7873-37]

10:20 am: **Toward material characterization using dual energy x-ray CT**, Joseph A. O'Sullivan, Bruce R. Whiting, David G. Politte, Washington Univ. in St. Louis (United States); Jeffrey F. Williamson, Virginia Commonwealth Univ. (United States) . . . . . .[7873-38]

Coffee Break . . . . . .10:40 to 11:10 am

11:10 am: **A hybrid approach to imaging and anomaly characterization from dual energy CT data**, Eric L. Miller, Oguz Semerici, Tufts Univ. (United States). . . . . .[7873-39]

11:30 am: **Robust multifrequency inversion in terahertz diffraction tomography**, David A. Castañón, Ke A. Chen, Boston Univ. (United States) . . . . . .[7873-40]

11:50 am: **A learning-based approach to material classification using multi-energy x-ray computed tomography**, Limor Eger, Prakash Ishwar, William C. Karl, Boston Univ. (United States) . . . . . .[7873-41]

12:10 pm: **Robustness of spectral CT for explosives detection**, Samit Basu, Morpho Detection Inc. (United States) . . . . . .[7873-42]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 9

**Oak Room . . . . . Tues. 2:00 to 3:00 pm**

### Special Session: Advance Methods in Tomographic Imaging II

*Session Chairs*: **Samit Basu,** Morpho Detection Inc.; **Charles A. Bouman,** Purdue Univ.

2:00 pm: **Constrain static target kinetic iterative image reconstruction for 4D cardiac CT imaging**, Adam M. Alessio, Univ. of Washington Medical Ctr. (United States); Patrick J. La Rivière, The Univ. of Chicago Medical Ctr. (United States) . . . . . .[7873-43]

2:20 pm: **Model based motion artifact reduction for computed tomography**, Zhou Yu, Jean-Baptist Thibault, GE Healthcare (United States); Jiao Wang, Ken D. Sauer, Univ. of Notre Dame (United States); Charles A. Bouman, Purdue Univ. (United States) . . . . . .[7873-44]

2:40 pm: **Bayesian estimation with Gauss-Markov-Potts priors in optical diffraction tomography**, Hacheme Ayasso, Bernard Duchêne, Ali Mohammad-Djafari, Lab. des Signaux et Systèmes (France). . . .[7873-03]

Coffee Break . . . . . 3:00 to 3:40 pm

## SESSION 10

**Oak Room . . . . . Tues. 3:40 to 5:00 pm**

### Advanced Methods in Inverse Problems

3:40 pm: **Accelerating sparse reconstruction for fast and precomputable system matrix inverses**, Stanley J. Reeves, Auburn Univ. (United States). . . . . .[7873-45]

4:00 pm: **An expectation maximization solution for fusing 2D and 3D ladar data**, Paul F. Dolce, Stephen C. Cain, Air Force Institute of Technology (United States) . . . . . .[7873-24]

4:20 pm: **Superresolution with the focused plenoptic camera**, Andrew Lumsdaine, Georgi N. Chunev, Indiana Univ. (United States); Todor G. Georgiev, Adobe Systems Inc. (United States). . . . . .[7873-25]

4:40 pm: **Content-preserving zoom-in view generation for surveillance videos,** Kenji Watanabe, Naoko Nitta, Noboru Babaguchi, Osaka Univ. (Japan). . . . . .[7873-26]

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Color image compression by gray-to-color mapping**, Mark S. Drew, Simon Fraser Univ. (Canada); Graham D. Finlayson, Univ. of East Anglia Norwich (United Kingdom); Abhilash Jindal, Indian Institute of Technology Kanpur (India) . . . . . .[7873-27]

**Human motion recognition based on tensor decomposition using multiple viewpoint image sequence**, Takayuki Hori, Jun Ohya, Waseda Univ. (Japan); Jun Kurumisawa, Chiba Univ. of Commerce (Japan). . . . . .[7873-28]

**Visual real-time detection, recognition, and tracking of ground and airborne targets**, Levente Kovács, Csaba Benedek, Computer and Automation Research Institute (Hungary) . . . . . .[7873-29]

**Illuminant color estimation by hue categorization based on gray world assumption**, Harumi Kawamura, Nippon Telegraph and Telephone Corp. (Japan); Shunichi Yonemura, Jun Ohya, Waseda Univ. (Japan); Norihiko Matsuura, Nippon Telegraph and Telephone Corp. (Japan). . . . .[7873-30]

**Super-resolved refocusing with a plenoptic camera**, Zhiliang Zhou, Univ. of Science and Technology of China (China); Yan Yuan, BeiHang Univ. (China); Xiangli Bin, Univ. of Science and Technology of China (China) and Academy of Opto-electronics, Chinese Academy of Sciences (China); Lulu Qian, Univ. of Science and Technology of China (China) . . . . . .[7873-31]

**Plenoptic rendering with interactive performance using GPUs**, Georgi N. Chunev, Andrew Lumsdaine, Indiana Univ. (United States); Todor G. Georgiev, Adobe Systems Inc. (United States). . . . . .[7873-32]

**Compressive through-focus wavefield imaging**, Edwin A. Marengo, Oren Mangoubi, Northeastern Univ. (United States). . . . . .[7873-33]

# Conference 7874

Tuesday-Thursday 25-27 January 2011 • Proceedings of SPIE Vol. 7874

# Document Recognition and Retrieval XVIII

*Conference Chairs:* **Gady Agam,** Illinois Institute of Technology; **Christian Viard-Gaudin,** Univ. of Nantes (France)

*Program Committee:* **Apostolos Antonacopoulos,** Univ. of Salford (United Kingdom); **Elisa H. Barney Smith,** Boise State Univ.; **Kathrin Berkner,** Ricoh Innovations, Inc.; **Xiaoqing Ding,** Tsinghua Univ. (China); **David S. Doermann,** Univ. of Maryland, College Park; **Oleg D. Golubitsky,** Google, Inc. (Canada); **Jianying Hu,** IBM Thomas J. Watson Research Ctr.; **Laurence Likforman-Sulem,** Telecom ParisTech (France); **Marcus Liwicki,** Deutsches Forschungszentrum für Künstliche Intelligenz GmbH (Germany); **Xiaofan Lin,** Vobile, Inc.; **Daniel P. Lopresti,** Lehigh Univ.; **Hiroshi Sako,** Hitachi, Ltd. (Japan); **Lambert R. B. Schomaker,** Univ. of Groningen (Netherlands); **Sargur N. Srihari,** Univ. at Buffalo; **Venkata Subramaniam,** IBM India Research Lab. (India); **Kazem Taghva,** Univ. of Nevada, Las Vegas; **George R. Thoma,** National Library of Medicine; **Alessandro Vinciarelli,** Univ. of Glasgow (United Kingdom); **Berrin Yanikoglu,** Sabanci Univ. (Turkey); **Jie Zou,** National Library of Medicine

## Tuesday 25 January

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Improved document image segmentation algorithm using multiresolution morphology**, Syed S. Bukhari, Technische Univ. Kaiserslautern (Germany); Faisal Shafait, DFKI GmbH (Germany); Thomas M. Breuel, Technische Univ. Kaiserslautern (Germany) . . . . . .[7874-12]

**A simple and effective figure caption detection system for old-style documents**, Zongyi Liu, Hanning Zhou, Amazon.com, Inc. (United States) . . . . . .[7874-28]

**Reflowing-driven paragraph recognition for electronic books in PDF**, Jing Fang, Zhi Tang, Liangcai Gao, Peking Univ. (China) . . . . . .[7874-29]

**Ruling line detection and removal**, Ergina Kavallieratou, Univ. of the Aegean (Greece); Daniel P. Lopresti, Jin Chen, Lehigh Univ. (United States) . . . . . .[7874-30]

**Natural scene logo recognition by joint boosting feature selection in salient regions**, Wei Fan, Jun Sun, Satoshi Naoi, Fujitsu Research and Development Center Co., Ltd. (China); Akihiro Minagawa, Yoshinobu Hotta, Fujitsu Labs., Ltd. (Japan) . . . . . .[7874-31]

**A framework to improve digital corpus uses: image-mode navigation**, Loris Eynard, Vincent Malleron, Hubert Emptoz, Univ. Claude Bernard Lyon 1 (France). . . . . .[7874-32]

**Parameter calibration for synthesizing realistic-looking variability in offline handwriting**, Wen Cheng, Daniel P. Lopresti, Lehigh Univ. (United States) . . . . . .[7874-33]

**Automatic segmentation of subfigure image panels for multimodal biomedical document retrieval**, Beibei Cheng, Missouri Univ. of Science and Technology (United States); Sameer K. Antani, National Library of Medicine (United States); Ronald J. Stanley, Missouri Univ. of Science and Technology (United States); Dina Demner-Fushman, George R. Thoma, National Library of Medicine (United States). . . . . .[7874-34]

**A new method for perspective correction of document images**, José Rodríguez-Pinñeiro, Pedro Comesaña-Alfaro, Fernando Pérez-González, Univ. de Vigo (Spain); Alberto Malvido-García, Bit Oceans Research, S.L. (Spain) . . . . . .[7874-35]

**Robust keyword retrieval method for OCRed text**, Yusaku Fujii, Hiroaki Takebe, Hiroshi Tanaka, Yoshinobu Hotta, Fujitsu Labs., Ltd. (Japan) . . . . . .[7874-36]

**Online medical symbol recognition using a tablet PC**, Amlan Kundu, Qian Hu, Stanley Boykin, Randy Fish, Cheryl Clark, Stephen Jones, Stephen Moore, MITRE Corp. (United States) . . . . . .[7874-37]

**Characterizing challenged 2008 Minnesota ballots**, George Nagy, Rensselaer Polytechnic Institute (United States); Daniel P. Lopresti, Lehigh Univ. (United States); Elisa H. Barney Smith, Boise State Univ. (United States); Ziyan Wu, Rensselaer Polytechnic Institute (United States) . . . . . .[7874-38]

**Document image retrieval with morphology-based segmentation and features combination**, Tiago Bockholt, Sr., George Darmiton, Sr., Carlos Mello, Sr., Univ. Federal de Pernambuco (Brazil) . . . . . .[7874-40]

**Boosting based text and non-text region classification**, Binqing Xie, Gady Agam, Illinois Institute of Technology (United States) . . . . .[7874-41]

**OMR of early plainchant manuscripts in square notation: a two-stage system**, Carolina Ramirez, Jun Ohya, Waseda Univ. (Japan) . . .[7874-42]

## Wednesday 26 January

**Grand Peninsula Ballroom A. . . . . Wed. 8:20 to 9:20 am**

### Plenary Session and Conference Award Presentations

8:25 am: **Problems in Biological Imaging: Opportunities for Signal Processing**, Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[EI11SE-102]

## SESSION 1

**Sandpebble Room E . . . . . Wed. 9:30 to 10:10 am**

### Invited Presentation I

9:30 am: **Scientific challenges underlying production document processing** *(Invited Paper)*, Eric Saund, Palo Alto Research Center, Inc. (United States). . . . . .[7874-01]

## SESSION 2

**Sandpebble Room E . . . . . Wed. 10:10 am to 12:10 pm**

### Content Analysis

10:10 am: **Automated identification of biomedical article type using support vector machines**, In-Cheol Kim, National Institutes of Health (United States); Daniel X. Le, George R. Thoma, National Library of Medicine (United States) . . . . . .[7874-02]

Coffee Break . . . . . .10:30 to 11:10 am

11:10 am: **Introduction of statistical information in a syntactic analyzer for document image recognition**, Andre Oliveira Maroneze, Bertrand Coüasnon, Institut National des Sciences Appliquées de Rennes (France); Aurélie Lemaitre, Institut de Recherche en Informatique et Systèmes Aléatoires (France). . . . . .[7874-03]

11:30 am: **High recall document content extraction**, Chang An, Lehigh Univ. (United States) . . . . . .[7874-04]

11:50 am: **Shape codebook based handwritten and machine printed text zone extraction**, Jayant Kumar, Univ. of Maryland, College Park (United States); Rohit Prasad, Huiagu Cao, BBN Technologies (United States); Wael Abd-Almageed, David S. Doermann, Univ. of Maryland, College Park (United States); Premkumar S. Natarajan, BBN Technologies (United States). . . . . .[7874-05]

Lunch Break . . . . . 12:10 to 2:00 pm

## SESSION 3

**Sandpebble Room E . . . . . Wed. 2:00 to 3:20 pm**

### Recognition

2:00 pm: **A MRF model with parameters optimization by CRF for on-line recognition of handwritten Japanese characters**, Bilan Zhu, Masaki Nakagawa, Tokyo Univ. of Agriculture and Technology (Japan) .[7874-06]

2:20 pm: **Improving a HMM-based off-line handwriting recognition system using MME-PSO optimization**, Mahdi Hamdani, Ecole Nationale d'Ingénieurs de Sfax (Tunisia); Haikal El Abed, Technische Univ. Braunschweig (Germany); Tarek M. Hamdani, Ecole Nationale d'Ingénieurs de Sfax (Tunisia); Volker Märgner, Technische Univ. Braunschweig (Germany); Adel M. Alimi, Ecole Nationale d'Ingénieurs de Sfax (Tunisia) . . . . . .[7874-07]

2:40 pm: **SemiBoost-based Arabic character recognition method**, Bing Su, Liangrui Peng, Xiaoqing Ding, Tsinghua Univ. (China) . . . . . .[7874-08]

3:00 pm: **First experiments on a new online handwritten flowchart database**, Ahmad M. Awal, Univ. de Nantes (France); Guihuan Feng, Nanjing Univ. (China); Harold Mouchère, Christian Viard-Gaudin, Univ. de Nantes (France) . . . . . .[7874-09]

Coffee Break . . . . . 3:20 to 4:00 pm

## SESSION 4

**Sandpebble Room E . . . . . Wed. 4:00 to 5:00 pm**

### Segmentation

4:00 pm: **Segmenting texts from outdoor images taken by mobile phones using color features**, Zongyi Liu, Hanning Zhou, Amazon.com, Inc. (United States) . . . . . .[7874-10]

4:20 pm: **A perceptive method for handwritten text segmentation**, Aurélie Lemaitre, Institut de Recherche en Informatique et Systèmes Aléatoires (France); Bertrand Coüasnon, Institut National des Sciences Appliquées de Rennes (France) . . . . . .[7874-11]

4:40 pm: **A masked-based enhancement method for historical documents**, Elisa H. Barney Smith, Boise State Univ. (United States); Jérôme Darbon, Ecole Normale Supérieure de Cachan (France); Laurence Likforman-Sulem, Telecom ParisTech (France) . . . . . .[7874-39]

# Thursday 27 January

## SESSION 5

**Sandpebble Room E . . . . . Thurs. 8:30 to 9:10 am**

### Invited Presentation II

8:30 am: **Example-centric document design and development** *(Invited Paper)*, Scott R. Klemmer, Stanford Univ. (United States) . . . . . .[7874-13]

## SESSION 6

**Sandpebble Room E . . . . . Thurs. 9:10 to 10:10 am**

### Writer Identification or Verification

9:10 am: **Feature relevance analysis for writer identification**, Imran Siddiqi, René Descartes Univ. (France) and National Univ. of Sciences and Technology (Pakistan); Khurram Khurshid, René Descartes Univ. (France) and Institute of Space Technology, Islamabad (Pakistan); Nicole Vincent, René Descartes Univ. (France) . . . . . .[7874-14]

9:30 am: **Using perturbed handwriting to support writer identification in the presence of severe data constraints**, Jin Chen, Wen Cheng, Daniel P. Lopresti, Lehigh Univ. (United States) . . . . . .[7874-15]

9:50 am: **Statistical characterization of handwriting characteristics using automated tools**, Gregory R. Ball, Sargur N. Srihari, Univ. at Buffalo (United States). . . . . .[7874-16]

Coffee Break . . . . . .10:10 to 10:50 am

## SESSION 7

**Sandpebble Room E . . . . . Thurs. 10:50 pm to 12:10 am**

### Information Retrieval

10:50 pm: **Keyword and image-based retrieval of mathematical expressions**, Richard Zanibbi, Bo Yuan, Rochester Institute of Technology (United States). . . . . .[7874-17]

11:10 pm: **Word spotting for handwritten documents using Chamfer distance and dynamic time warping**, Raid M. Saabni, Jihad A. El-Sana, Ben-Gurion Univ. of the Negev (Israel) . . . . . .[7874-18]

11:30 pm: **Automatic identification of ROI in figure images toward improving hybrid (text and image) biomedical document retrieval**, Daekeun You, Univ. at Buffalo (United States); Sameer K. Antani, Dina Demner-Fushman, Md Mahmudur Rahman, National Library of Medicine (United States); Venu Govindaraju, Univ. at Buffalo (United States); George R. Thoma, National Library of Medicine (United States) . . . . . .[7874-19]

11:50 pm: **Automatic extraction of numeric strings in unconstrained handwritten document images**, Mehdi M. Haji, Tien D. Bui, Ching Y. Suen, Concordia Univ. (Canada). . . . . .[7874-20]

Lunch Break . . . . . 12:10 to 1:40 pm

## SESSION 8

**Sandpebble Room E . . . . . Thurs. 1:40 to 3:00 pm**

### Document Recognition

1:40 pm: **Unsupervised method to generate page templates**, Hervé Déjean, Xerox Research Ctr. Europe Grenoble (France). . . . . .[7874-21]

2:00 pm: **Font group identification using reconstructed fonts**, Michael P. Cutter, Joost van Beusekom, Technische Univ. Kaiserslautern (Germany); Faisal Shafait, DFKI GmbH (Germany); Thomas M. Breuel, Technische Univ. Kaiserslautern (Germany) . . . . . .[7874-22]

2:20 pm: **How carefully designed open resource sharing can help and expand document analysis research**, Bart Lamiroy, Univ. Nancy 2 (France) and Lehigh Univ. (United States); Daniel P. Lopresti, Jeff Heflin, Henry F. Korth, Lehigh Univ. (United States) . . . . . .[7874-23]

2:40 pm: **Multiple-agent adaptation in whole-book recognition**, Pingping Xiu, Henry S. Baird, Lehigh Univ. (United States) . . . . .[7874-24]

Coffee Break . . . . . 3:00 to 3:30 pm

## SESSION 9

**Sandpebble Room E . . . . . Thurs. 3:30 to 4:30 pm**

### OCR Error and Binarization

3:30 pm: **Ancient documents bleed-through evaluation and its application for predicting OCR error rates**, Vincent Rabeux, Journet Nicholas, Jean-Philippe Domenger, Univ. Bordeaux 1 (France). .[7874-25]

3:50 pm: **Binarization of camera-captured document using A MAP approach**, Xujun Peng, Srirangaraj Setlur, Venu Govindaraju, Univ. at Buffalo (United States); Ramachandrula Sitaram, Hewlett-Packard Labs. India (India) . . . . . .[7874-26]

4:10 pm: **Statistical multiresolution schemes for historical document binarization**, Tayo Obafemi-Ajayi, Gady Agam, Illinois Institute of Technology (United States). . . . . .[7874-27]

# Conference 7875

Tuesday-Thursday 25-27 January 2011 • Proceedings of SPIE Vol. 7875

# Sensors, Cameras, and Systems for Industrial, Scientific, and Consumer Applications XII

*Conference Chairs:* **Ralf Widenhorn,** Portland State Univ.; **Valérie Nguyen,** CEA Leti MINATEC (France)

*Program Committee:* **Morley M. Blouke,** Portland State Univ.; **Terrence S. Lomheim,** The Aerospace Corp.; **Kevin J. Matherson,** Hewlett-Packard Co.; **Gloria G. Putnam,** Eastman Kodak Co.; **Alice L. Reinheimer,** e2v; **Nobukazu Teranishi,** Panasonic Corp. (Japan); **Erik Bodegom,** Portland State Univ.; **Xinyang Wang,** CMOSIS nv (Belgium); **Bruce True,** Intevac Photonics, Inc.; **Penny G. Warren,** Ball Aerospace & Technologies Corp.; **Pierre Magnan,** Institut Supérieur de l'Aéronautique et de l'Espace (France)

## Tuesday 25 January

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Approach to quantitative detection of CD146 with the biosensor based on imaging ellipsometry**, Yu Niu, Li Liu, Institute of Mechanics (China); Xiyun Yan, Institute of Biophysics (China); Gang Jin, Institute of Mechanics (China) . . . . . .[7875-26]

**Dynamic range extension of a CMOS active pixel sensor by in-pixel charge mixing**, Sung-Hyun Jo, Myunghan Bae, Jae-Sung Kong, Jang-Kyoo Shin, Kyungpook National Univ. (Korea, Republic of) . . . . .[7875-27]

**A novel 3D architecture for high dynamic range image sensor and on-chip data compression**, Guezzi M. Fadoua, Lab. d'Electronique de Technologie de l'Information (France); Antoine Dupret, Ecole Supérieure d'Ingénieurs en Electronique et Electrotechnique (France); Arnaud Peizerat, Lab. d'Electronique de Technologie de l'Information (France); Yves Blanchard, Ecole Supérieure d'Ingénieurs en Electronique et Electrotechnique (France) . . . . . .[7875-28]

**Improvement for sensitivity of biosensor with total internal reflection imaging ellipsometry (TIRIE)**, Li Liu, Institute of Mechanics (China); Yanyan Chen, Suzhou Institute of Nano-tech and Nano-bionics (China); Yonghong Meng, She Chen, Gang Jin, Institute of Mechanics (China) . . . . . .[7875-29]

## Wednesday 26 January

**Grand Peninsula Ballroom A . . . . . Wed. 8:20 to 9:20 am**

### Plenary Session and Conference Award Presentations

8:25 am: **Problems in Biological Imaging: Opportunities for Signal Processing**, Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[EI11SE-102]

## SESSION 1

**Regency Ballroom C . . . . . Wed. 9:30 to 10:30 am**

### Color and Multispectral Techniques

*Session Chair*: **Alice L. Reinheimer,** e2v

9:30 am: **Single-chip color imaging for UHDTV camera with a 33M-pixel CMOS image sensor**, Ryohei Funatsu, Takayuki Yamashita, Kohji Mitani, Yuji Nojiri, NHK Science & Technical Research Labs. (Japan) . . . . . .[7875-01]

9:50 am: **On the design of multispectral color filter arrays**, Jon Y. Hardeberg, Rahat Khan, Raju Shrestha, Gjøvik Univ. College (Norway) . . . . . .[7875-02]

10:10 am: **Spectral-based calorimetric calibration of a 3CCD color camera for fast and accurate characterization and calibration of LCD displays**, Reza Safaee-Rad, Qualcomm Inc. (Canada); Milivoje Aleksic, Qualcomm Inc. (United States) . . . . . .[7875-03]

Coffee Break . . . . . .10:30 to 11:10 am

## SESSION 2

**Regency Ballroom C . . . . . Wed. 11:10 am to 12:30 pm**

### Advanced Camera Systems I

*Session Chair*: **Ralf Widenhorn,** Portland State Univ.

11:10 am: **Optimizing quantum efficiency in a stacked CMOS sensor**, Robert S. Hannebauer, Lumiense Photonics, Inc. (Canada); Sang-Keun Yoo, HanVision Co. Ltd. (Korea, Republic of); David L. Gilblom, Alexander D. Gilblom, Alternative Vision Corp. (United States) . . . . . .[7875-04]

11:30 am: **Extremely lightweight Fourier transform imaging spectrometer**, Xiaowei Xia, Alexander V. Parfenov, Edward A. DeHoog, Tin M. Aye, Min-Yi Shih, Physical Optics Corp. (United States) . .[7875-05]

11:50 am: **Detailed characterisation of a new large area CCD manufactured on high resistivity silicon**, Mark S. Robbins, Pritesh Mistry, Paul Jorden, e2v technologies plc (United Kingdom) . . . .[7875-06]

12:10 pm: **Simulating enhanced photo carrier collection in the multifinger photogate active pixel sensors**, Phanindra V. R. Kalyanam, Glenn H. Chapman, Ash M. Parameswaran, Simon Fraser Univ. (Canada) . . . . . .[7875-07]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 3

**Regency Ballroom C . . . . . Wed. 1:50 to 3:20 pm**

### Advanced Camera Systems II

*Session Chair*: **Ralf Widenhorn,** Portland State Univ.

1:50 pm: **An introduction to the atmospheric imaging assembly (AIA) on the Solar Dynamics Observatory (SDO)** *(Invited Paper)*, Alan M. Title, Lockheed Martin Space Systems Co. (United States) . . . . . .[7875-08]

2:20 pm: **OCam2: world's fastest and most sensitive camera system for advanced AO wavefront sensing**, Philippe Feautrier, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Jean-Luc Gach, Philippe Balard, Observatoire Astronomique de Marseille-Provence (France); Christian Guillaume, Observatoire de Haute Provence (France); Mark Downing, Norbert Hubin, European Southern Observatory (Germany); Eric Stadler, Yves Magnard, Lab. d'Astrophysique de l'Observatoire de Grenoble (France); Michael Skegg, Mark S. Robbins, Sandy Denney, Wolfgang Suske, Paul Jorden, Patrick Wheeler, Peter Pool, Ray Bell, David Burt, Ian Davies, e2v technologies plc (United Kingdom); Javier Reyes, Manfred Meyer, Dietrich Baade, Markus Kasper, Robin Arsenault, European Southern Observatory (Germany); Thierry Fusco, ONERA (France); José Javier Diaz, Instituto de Astrofísica de Canarias (Spain) . . . . . .[7875-09]

2:40 pm: **Correcting distortion and braiding of micro-images from multi-aperture imaging systems**, Alexander Oberdörster, Andreas Brückner, Frank C. Wippermann, Andreas Bräuer, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany). . . . . .[7875-10]

3:00 pm: **An analog logarithmic number system subtractor for edge detection in logarithmic CMOS image sensors**, Dileep R. Desai, The Univ. of Akron (United States); Firas Hassan, Ohio Northern Univ. (United States); Robert Veillette, Joan Carletta, The Univ. of Akron (United States) . . . . . .[7875-11]

Coffee Break . . . . . 3:20 to 4:00 pm

## SESSION 4

**Regency Ballroom C . . . . . Wed. 4:00 to 5:00 pm**

### Applications

*Session Chair*: **Valérie Nguyen,** Commissariat à l'Énergie Atomique (France)

4:00 pm: **A CMOS image sensor with draining only modulation pixels for fluorescence lifetime imaging**, Zhuo Li, Keita Yasutomi, Taishi Takasawa, Shinya Itoh, Shoji Kawahito, Shizuoka Univ. (Japan) .[7875-12]

4:20 pm: **Development of biosensor based on imaging ellipsometry and its applications**, Gang Jin, Institute of Mechanics (China) . .[7875-14]

4:40 pm: **Study on colony image acquisition and analysis system**, Zongpu Jia, Weixing Wang, Henan Polytechnic Univ. (China) . . .[7875-15]

# Thursday 27 January

## SESSION 5

**Regency Ballroom C . . . . . Thurs. 8:30 to 10:10 am**

### Noise

*Session Chair*: **Morley M. Blouke,** Portland State Univ.

8:30 am: **Aging effects on image sensors due to terrestrial cosmic radiation**, Gayathri Gangadharan Nampoothiri, Albert J. P. Theuwissen, Technische Univ. Delft (Netherlands); Marc Horemans, Consultant (Belgium) . . . . . .[7875-16]

8:50 am: **Nonlinear time dependence of dark current in charge-coupled devices**, Ralf Widenhorn, Justin Dunlap, Erik Bodegom, Portland State Univ. (United States) . . . . . .[7875-17]

9:10 am: **Tradeoffs in imager design parameters for sensor reliability**, Glenn H. Chapman, Jenny Leung, Simon Fraser Univ. (Canada); Zahava Koren, Israel Koren, Univ. of Massachusetts Amherst (United States) . . . . . .[7875-18]

9:30 am: **Dark noise in a CMOS imager pixel with negative bias on transfer gate**, Hirofumi Yamashita, Motohiro Maeda, Shogo Furuya, Takanori Yagami, Toshiba Materials Co., Ltd. (Japan) . . . . . .[7875-19]

9:50 am: **Image sensor noise: you love it or you hate it!**, Albert J. P. Theuwissen, Harvest Imaging (Belgium) . . . . . .[7875-20]

Coffee Break . . . . . .10:10 to 10:40 am

## SESSION 6

**Regency Ballroom C . . . . . Thurs. 10:40 am to 12:50 pm**

### Single Photon Detection

*Session Chair*: **Erik Bodegom,** Portland State Univ.

10:40 am: **The early history of CCDs** *(Invited Paper)*, Morley M. Blouke, Portland State Univ. (United States) . . . . . .[7875-21]

11:10 am: **3D ranging with a single-photon imaging array**, Simone Bellisai, Fabrizio Guerrieri, Politecnico di Milano (Italy); Simone Tisa, Micro Photon Devices S.r.l. (Italy); Franco Zappa, Politecnico di Milano (Italy) and Micro Photon Devices S.r.l. (Italy) . . . . . .[7875-22]

11:30 am: **Linear arrays of single-photon detectors for photon counting and timing**, Fabrizio Guerrieri, Politecnico di Milano (Italy); Simone Tisa, Micro Photon Devices S.r.l. (Italy); Alberto Tosi, Simone Bellisai, Bojan Markovic, Politecnico di Milano (Italy); Franco Zappa, Politecnico di Milano (Italy) and Micro Photon Devices S.r.l. (Italy)[7875-23]

11:50 am: **A single photon sensitive fast ebCMOS camera system for multitarget tracking of single fluorophores: applications to nano-biophotonics**, Thomas Cajgfinger, Rémi Barbier, Agnès Dominjon, Eric Chabanat, Doan Quang Tuyen, Cyrille Guérin, Julien Houles, Institut de Physique Nucléaire de Lyon (France) . . . . . .[7875-24]

12:10 pm: **Monolithic single-photon detectors and time-to-digital converters for picoseconds time-of-flight ranging**, Bojan Markovic, Politecnico di Milano (Italy); Simone Tisa, Micro Photon Devices S.r.l. (Italy); Alberto Tosi, Franco Zappa, Politecnico di Milano (Italy) . .[7875-25]

12:30 pm: **Human-technology interaction for IED detection**, Alan Zhang, Yiyang Zou, Liping Wu, EYZtek, Inc. (United States); Jack E. Fulton, Naval Surface Warfare Ctr. Crane Div. (United States) . . . . . .[7875-30]

# Conference 7876

Monday-Tuesday 24-25 January 2011 • Proceedings of SPIE Vol. 7876

# Digital Photography VII

*Conference Chairs:* **Francisco H. Imai,** Canon U.S.A., Inc.; **Feng Xiao,** Fairchild Imaging

*Conference Co-Chairs:* **Jeffrey M. DiCarlo,** Intuitive Surgical; **Nitin Sampat,** Rochester Institute of Technology; **Sebastiano Battiato,** Univ. degli Studi di Catania (Italy)

*Program Committee:* **Donald J. Baxter,** STMicroelectronics (R&D) Ltd. (United Kingdom); **Ajit S. Bopardikar,** Samsung Electronics, India Software Operations Ltd. (India); **Peter B. Catrysse,** Stanford Univ.; **Ted J. Cooper,** Lens Vector, Inc.; **Alexandru F. Drimbarean,** Tessera (FotoNation) Ireland Ltd. (Ireland); **Joyce E. Farrell,** Stanford Univ.; **Guotong Feng,** Ricoh Innovations, Inc.; **Boyd A. Fowler,** Fairchild Imaging; **Sergio R. Goma,** Qualcomm Inc.; **Mirko Guarnera,** STMicroelectronics (Italy); **Frédéric Guichard,** DxO Labs. (France); **Xiaoyun Jiang,** Qualcomm Inc.; **George John,** Motorola, Inc.; **Michael A. Kriss,** Consultant; **Jiangtao Kuang,** OmniVision Technologies, Inc.; **Feng Li,** Aptina Imaging Corp.; **J. Dylan Li,** LifeSize Communications; **Kevin J. Matherson,** Hewlett-Packard Co.; **Jon S. McElvain,** Digital Imaging Systems; **Ricardo J. Motta,** Consultant; **Seishi Ohmori,** Nikon Corp. (Japan); **Manu Parmar,** Qualcomm Inc.; **Gloria G. Putnam,** Eastman Kodak Co.; **John R. Reinert-Nash,** Lifetouch, Inc.; **M. Dirk Robinson,** Skybox Imaging; **Brian G. Rodricks,** Fairchild Imaging; **Todd Sachs,** Aptina Imaging Corp.; **Qun Sun,** Aptina Imaging Corp.; **Sabine E. Süsstrunk,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Touraj Tajbakhsh,** Dream Chip Technologies (Germany); **Radka Tezaur,** Nikon Precision Inc.; **Michael Wang,** Cisco Systems, Inc.; **Dietmar Wüller,** Image Engineering (Germany); **Weihua Xiong,** OmniVision Technologies, Inc.; **Alireza Yasan,** Foveon Inc.; **Lei Zhang,** The Hong Kong Polytechnic Univ. (Hong Kong, China)

*Cosponsored by:* Fairchild imaging; Canon, CANON DEVELOPMENT AMERICAS, INC.

## Monday 24 January

**Regency Ballroom C . . . . . Mon. 9:25 to 9:30 am**

### Introductory Remarks

## SESSION 1

**Regency Ballroom C . . . . . Mon. 9:30 to 10:10 am**

### Invited Paper

*Session Chairs*: **Francisco H. Imai,** Canon U.S.A., Inc.; **Feng Xiao,** Fairchild Imaging

9:30 am: **High dynamic range image sensor architectures** *(Invited Paper)*, B. Fowler, Fairchild Imaging (United States). . . . . .[7876-01]

Coffee Break . . . . . .10:10 to 10:50 am

## SESSION 2

**Regency Ballroom C . . . . . Mon. 10:50 am to 12:30 pm**

### Computational Photography

*Session Chair*: **Touraj Tajbakhsh,** Technische Univ. Hamburg-Harburg (Germany)

10:50 am: **Bayer and panchromatic color filter array demosaicing by sparse recovery**, Mohammad Aghagolzadeh, Abdolreza Abdolhosseini Moghadam, Hayder Radha, Michigan State Univ. (United States); Mrityunjay Kumar, Eastman Kodak Co. (United States) . . . . . .[7876-02]

11:10 am: **Improved motion invariant imaging with time varying shutter functions**, Steve Webster, Andrew J. Dorrell, Canon Information Systems Research Australia Pty. Ltd. (Australia) . . . . . .[7876-03]

11:30 am: **Optimal image acquisition by auto-defocusing**, Tao Ma, Stanley J. Reeves, Auburn Univ. (United States) . . . . . .[7876-04]

11:50 am: **Mobile phone imaging module with extended depth of focus based on axial irradiance equalization phase coding**, Hsin-Yueh Sung, National Tsing Hua Univ. (Taiwan); Po-Chang Chen, Chuan-Chung Chang, Chir-Weei Chang, Industrial Technology Research Institute (Taiwan); Sidney S. Yang, National Tsing Hua Univ. (Taiwan); Horng Chang, Industrial Technology Research Institute (Taiwan) . . . . . .[7876-05]

12:10 pm: **Performance of extended depth of field systems and theoretical diffraction limit**, Nicolas Bachelard, Frédéric Guichard, DxO Labs (France). . . . . .[7876-06]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 3

**Regency Ballroom C . . . . . Mon. 2:00 to 3:20 pm**

### Spectral Imaging

*Session Chair*: **Manu Parmar,** Stanford Univ.

2:00 pm: **Implementation of a multispectral color imaging device without color filter array**, Giacomo Langfelder, Antonio F. Longoni, Federico Zaraga, Politecnico di Milano (Italy) . . . . . .[7876-07]

2:20 pm: **One shot multispectral color imaging with a stereo camera**, Raju Shrestha, Jon Y. Hardeberg, Gjøvik Univ. College (Norway); Alamin Mansouri, Univ. de Bourgogne (France) . . . . . .[7876-08]

2:40 pm: **Multispectral image invariant to illumination colour, strength, and shading**, Mark S. Drew, Amin Yazdani, Simon Fraser Univ. (Canada) . . . . . .[7876-09]

3:00 pm: **Methods for spectral characterization of multispectral cameras**, Julie Klein, Johannes Brauers, Til Aach, RWTH Aachen (Germany) . . . . . .[7876-10]

Coffee Break . . . . . 3:20 to 4:00 pm

## SESSION 4

**Regency Ballroom C . . . . . Mon. 4:00 to 5:00 pm**

### Image Processing

*Session Chair*: **Ajit S. Bopardikar,** Samsung Electronics, India Software Operations Ltd. (India)

4:00 pm: **Evaluation of a hyper-spectral image database for color filter array design and demosaicking algorithms**, Mohamed-Chaker Larabi, Univ. de Poitiers (France); Sabine E. Süsstrunk, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . .[7876-11]

4:20 pm: **Automatic annotation of outdoor photographs**, Claudio Cusano, Raimondo Schettini, Univ. degli Studi di Milano-Bicocca (Italy) . . . . . .[7876-12]

4:40 pm: **Fast orientation driven multi-structure morphological inpainting**, Devageor Jemi Florinabel, S. Edenezer Juliet, V. Sadasivam, Manonmanium Sundaranar Univ. (India) . . . . . .[7876-13]

# Tuesday 25 January

**Grand Peninsula Ballroom A . . . . . Tues. 8:20 to 9:20 am**

### Plenary Session and Society Award Presentations

8:25 am: **New Dimensions in Visual Quality**, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

## SESSION 5

**Regency Ballroom C . . . . . Tues. 9:30 to 10:30 am**

### Sensors and Optics

*Session Chair*: **Peter B. Catrysse,** Stanford Univ.

9:30 am: **How many pixels does it take to make a good 4”x6” print? Pixel count wars revisited**, Michael A. Kriss, Consultant (United States) . . . . . .[7876-14]

9:50 am: **A prototype high-speed CMOS image sensor with 10,000,000 burst-frame rate and 10,000 continuous-frame rate**, Yasuhisa Tochigi, Katsuhiko Hanzawa, Yuri Kato, Nana Akahane, Rihito Kuroda, Shigetoshi Sugawa, Tohoku Univ. (Japan) . . . . . .[7876-15]

10:10 am: **Two-dimensional measurement of the lens optical transfer function from a digital image**, David P. Morgan-Mar, Matthew R. Arnison, Chris A. Deller, Peter A. Fletcher, Kieran G. Larkin, Canon Information Systems Research Australia Pty. Ltd. (Australia) . . . . . .[7876-16]

Coffee Break . . . . . 10:30 to 11:10 pm

## SESSION 6

**Regency Ballroom C . . . . . .Tues. 11:10 am to 12:10 pm**

### Image Enhancement

*Session Chair*: **Sebastiano Battiato,** Univ. degli Studi di Catania (Italy)

11:10 am: **Efficient defect pixel cluster detection and correction for Bayer CFA image sequences**, Touraj Tajbakhsh, Technische Univ. Hamburg-Harburg (Germany) . . . . . .[7876-17]

11:30 am: **Image scaling with aliasing cancellation**, Alan Tonisson, Andrew J. Dorrell, Nagita Mehrseresht, Richard Zillman, Canon Information Systems Research Australia Pty. Ltd. (Australia) . . . . . .[7876-18]

11:50 am: **Random-temporal block selection for video stabilization**, Sebastiano Battiato, Univ. degli Studi di Catania (Italy); Arcangelo R. Bruna, STMicroelectronics (Italy); Giovanni Puglisi, Univ. degli Studi di Catania (Italy) . . . . . .[7876-19]

Lunch Break . . . . . 12:10 to 2:00 pm

## SESSION 7

**Regency Ballroom A . . . . . Tues. 2:00 to 3:40 pm**

### Image Quality in Digital Photography: Joint Session with Conference 7867

*Session Chairs*: **Jon S. McElvain,** Digital Imaging Systems; **Peter D. Burns,** Carestream Health, Inc.

2:00 pm: **Reference image method for measuring quality of photographs produced by digital cameras**, Mikko Nuutinen, Aalto Univ. School of Science and Technology (Finland); Olli Orenius, Timo S. Säämänen, Univ. of Helsinki (Finland); Pirkko T. Oittinen, Aalto Univ. School of Science and Technology (Finland) . . . . . .[7867-22]

2:20 pm: **RAW camera DPCM compression performance analysis**, Katherine Bouman, Vikas Ramachandra, Kalin Atanassov, Mickey Aleksic, Sergio R. Goma, Qualcomm Inc. (United States) . . . . . .[7867-23]

2:40 pm: **Comparison of objective metrics for image sensor crosstalk characterization**, Alexander Dokoutchaev, Aptina Imaging Corp. (United States); Henrik Eliasson, Sony Ericsson Mobile Communications AB (Sweden); Feng Li, Aptina Imaging Corp. (United States) . . . . . .[7876-20]

3:00 pm: **An image quality evaluation tool simulating image sensors including quantum efficiency off-axis effect**, Clémence Mornet, Jérôme M. Vaillant, Thomas Decroux, Nicolas Virollet, Didier Herault, STMicroelectronics (France); Isabelle Schanen, Institut de Microélectronique Électromagnétisme et Photonique (France) . .[7876-21]

3:20 pm: **Image quality assessment based on edge**, Xuanqin Mou, Min Zhang, Wufeng Xue, Xi’an Jiaotong Univ. (China); Lei Zhang, The Hong Kong Polytechnic Univ. (China) . . . . . .[7876-22]

Coffee Break . . . . . 3:40 to 4:00 pm

## SESSION 8

**Regency Ballroom A . . . . . Tues. 4:00 to 5:20 pm**

### High Dynamic Range Imaging: Joint Session with Conference 7867

*Session Chairs*: **Ricardo J. Motta,** Attom Research; **Susan P. Farnand,** Rochester Institute of Technology

4:00 pm: **Brightness, lightness, and specifying color in high-dynamic-range scenes and images**, Mark D. Fairchild, Ping-Hsu Chen, Rochester Institute of Technology (United States) . . . . . .[7867-24]

4:20 pm: **Method for evaluating tone mapping operators for natural high dynamic range images**, Mikko Kuhna, Mikko Nuutinen, Pirkko Oittinen, Aalto Univ. School of Science and Technology (Finland)[7876-23]

4:40 pm: **High dynamic range imaging of non-static scenes**, Imtiaz Hossain, Bahadir Gunturk, Louisiana State Univ. (United States) [7876-24]

5:00 pm: **Evaluating HDR photos using Web 2.0 technology,** Guoping Qiu, Yujie Mei, The Univ. of Nottingham (United Kingdom) . . . . .[7867-25]

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

## Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Toward a quantitative visual noise evaluation of sensors and image processing pipes to improve color reconstruction**, Clémence Mornet, STMicroelectronics (France); Donald J. Baxter, STMicroelectronics (R&D) Ltd. (United Kingdom); Jérôme M. Vaillant, Thomas Decroux, Didier Herault, STMicroelectronics (France); Isabelle Schanen, Institut de Microélectronique Électromagnétisme et Photonique (France) . .[7876-25]

**Fidelity tolerance analysis for computational imaging system**, Chuan-Chung Chang, Yung-Lin Chen, Kuang-Vu Chen, Hsiao-Yue Tsao, Hsin-Yueh Sung, Chir-Weei Chang, Po-Chang Chen, Horng Chang, Industrial Technology Research Institute (Taiwan) . . . . . .[7876-26]

**Noise-robust image deblurring by blending regular- and short-exposure images**, Yoshiyuki Tsuda, Haruo Hatanaka, Shimpei Fukumoto, Masaaki Ueda, SANYO Electric Co., Ltd. (Japan); Kunihiro Chihara, Nara Institute of Science and Technology (Japan) . . . . . .[7876-27]

**Improving the sensitometric and OECF standards: recognizing the photosensitive exposure range**, Michael G. Prais, Consultant (United States) . . . . . .[7876-28]

**Image enhancement technique using color and edge features for mobile imaging systems**, Won-ho Cho, Tae-Chan Kim, SAMSUNG Electronics Co., Ltd. (Korea, Republic of) . . . . . .[7876-29]

**Rectangular pixels for efficient color image sampling**, Tripurari Singh, Mritunjay Singh, Consultant (United States) . . . . . .[7876-30]

**A robust color signal processing with wide dynamic range WRGB CMOS image sensor**, Shun Kawada, Rihito Kuroda, Shigetoshi Sugawa, Tohoku Univ. (Japan). . . . . .[7876-31]

**Adaptive contrast enhancement for underexposed images**, Silvia Corchs, Francesca Gasparini, Raimondo Schettini, Univ. degli Studi di Milano-Bicocca (Italy) . . . . . .[7876-32]

**Moving refractive optical low pass filter for digital cameras**, Michael Schöberl, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Juergen D. Ernst, Wolfgang Schnurrer, Siegfried Fößel, Fraunhofer-Institut für Integrierte Schaltungen (Germany); André Kaup, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . .[7876-34]

**A JPEG-like algorithm for compression of camera sensors images**, Omar Benahmed Daho, XLIM-SIC (France); Mohamed-Chaker Larabi, Univ. de Poitiers (France) . . . . . .[7876-35]

**Reduced reference image quality assessment based on statistics of edge**, Min Zhang, Wufeng Xue, Xuanqin Mou, Xi'an Jiaotong Univ. (China) . . . . . .[7876-36]

**Evaluation of LED flash performance for camera phones**, John Pincenti, Cole Sheldon, By-Her Richards, George John, Motorola, Inc. (United States). . . . . .[7876-37]

**Characterization of pixel crosstalk and impact of Bayer patterning by quantum efficiency measurement**, Jérôme M. Vaillant, STMicroelectronics (France); Clémence Mornet, STMicroelectronics (France) and IMEP (France); Thomas Decroux, Didier Herault, STMicroelectronics (France); Isabelle Schanen, IMEP (France) . .[7876-39]

# Conference 7877

Tuesday-Thursday 25-27 January 2011 • Proceedings of SPIE Vol. 7877

# Image Processing: Machine Vision Applications IV

*Conference Chairs:* **David Fofi,** Univ. de Bourgogne (France); **Philip R. Bingham,** Oak Ridge National Lab.

*Program Committee:* **Atilla M. Baskurt,** Univ. Claude Bernard Lyon 1 (France); **Pierrick T. Bourgeat,** Australian e-Health Research Ctr. (Australia); **Jun Cheng,** Chinese Academy of Sciences (China); **Michael J. Cree,** The Univ. of Waikato (New Zealand); **Laurent C. Duval,** IFP (France); **Ewald Fauster,** vatron GmbH (Austria); **Steven P. Floeder,** 3M Co.; **Luciano F. Fontoura Da Costa,** Univ. de São Paulo (Brazil); **Olivier Laligant,** Univ. de Bourgogne (France); **Edmund Lam,** The Univ. of Hong Kong (Hong Kong, China); **Xavier Lladó,** Univ. de Girona (Spain); **Fabrice Mériaudeau,** Univ. de Bourgogne (France); **Dinesh Nair,** National Instruments Corp.; **Kurt S. Niel,** Fachhochschule Wels (Austria); **Jeffery R. Price,** Oak Ridge National Lab.; **A. Ravishankar Rao,** IBM Thomas J. Watson Research Ctr.; **Hamed Sari-Sarraf,** Texas Tech Univ.; **Peter Schelkens,** Vrije Univ. Brussel (Belgium); **Ralph Seulin,** Univ. de Bourgogne (France); **Ivan W. Selesnick,** Polytechnic Institute of NYU; **Yvon Voisin,** Univ. de Bourgogne (France); **Gerald Zauner,** Fachhochschule Wels (Austria)

## Tuesday 25 January

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Vehicle detection using new AdaBoost features**, Hyo-Jin Park, Ju-Young Kim, Chan-Su Lee, Ja-Soon Jang, LED-IT Fusion Technology Research Ctr. (Korea, Republic of) . . . . . .[7877-08]

**Vehicle detection using DOM-FAST and support vector machine**, Ju-Young Kim, LED-IT Fusion Technology Research Ctr. (Korea, Republic of); Chan-Su Lee, Ja-Soon Jang, Yeungnam Univ. (Korea, Republic of); Hyo-Jin Park, LED-IT Fusion Technology Research Ctr. (Korea, Republic of) . . . . . .[7877-29]

**Failures on atmospheric visibility measurements using digital image processing**, Alejandro Restrepo-Martínez, Francisco E. Lopez, Instituto Tecnológico Metropolitano (Colombia) . . . . . .[7877-30]

**Segmentation and visualization of anatomical structures from volumetric medical images**, Jonghyun Park, Soon-Young Park, Mokpo National Univ. (Korea, Republic of); Wanhyun Cho, Chonnam National Univ. (Korea, Republic of) . . . . . .[7877-31]

**Extraction and fusion of spectral parameters for face recognition**, Zeguidi Abdessalem, Bastien Billiot, Pierre Gouton, Jon Y. Hardeberg, Univ. de Bourgogne (France). . . . . .[7877-32]

**Monitoring plant growth using high resolution micro-CT images**, Vincent C. Paquit, Shaun S. Gleason, Udaya C. Kalluri, Oak Ridge National Lab. (United States). . . . . .[7877-33]

**Automating the estimation of coating thickness measurements in the ball crater technique**, Jungang Huang, The City Univ. (United Kingdom) and Teer Coatings Ltd. Berry Hill Industrial Estate (United Kingdom); Panos Liatsis, The City Univ. (United Kingdom); Kevin Cooke, Dennis Teer, Teer Coatings Ltd. (United Kingdom) . . . . . .[7877-35]

## Wednesday 26 January

**Grand Peninsula Ballroom A . . . . . Wed. 8:20 to 9:20 am**

### Plenary Session and Conference Award Presentations

8:25 am: **Problems in Biological Imaging: Opportunities for Signal Processing**, Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[EI11SE-102]

## SESSION 1

**Sandpebble Room C . . . . . Wed. 9:30 to 10:30 am**

### Image and Signal Processing I

*Session Chair*: **Philip R. Bingham,** Oak Ridge National Lab.

9:30 am: **Lipschitz exponents based signal restoration**, Bushra Jalil, Ouadi Beya, Eric Fauvet, Olivier Laligant, Univ. de Bourgogne (France) . . . . . .[7877-01]

9:50 am: **Real-time wavelet-based inline banknote-in-bundle counting for cut-and-bundle machines**, Volker Lohweg, Ostwestfalen-Lippe Univ. of Applied Sciences (Germany); Johannes Schaede, Thomas Türke, KBA-GIORI S.A. (Switzerland); Eugen Gillich, Ostwestfalen-Lippe Univ. of Applied Sciences (Germany); Denis Petker, OWITA GmbH (Germany); Harald Willeke, KBA-Bielefeld (Germany) . . . . . .[7877-02]

10:10 am: **A robust segmentation and tracking method for characterizing GNSS signals reception environment**, Andrea Cohen, Cyril Meurie, Yassine Ruichek, Univ. de Technologie de Belfort-Montbéliard (France); Juliette Marais, Univ. Lille Nord de France (France) . . . . . .[7877-03]

Coffee Break . . . . . .10:30 to 11:10 am

## SESSION 2

**Sandpebble Room C . . . . . Wed. 11:10 am to 12:30 pm**

### Image and Signal Processing II

*Session Chair*: **Philip R. Bingham,** Oak Ridge National Lab.

11:10 am: **Accurate, fast, and robust centre localisation for images of semiconductor components**, Fabian Timm, Univ. zu Lübeck (Germany) and Pattern Recognition Co. GmbH (Germany); Erhardt Barth, Univ. zu Lübeck (Germany) . . . . . .[7877-04]

11:30 am: **A 2D histogram representation of images for pooling**, Xinnan Yu, Yu-Jin Zhang, Tsinghua Univ. (China). . . . . .[7877-27]

11:50 am: **Gram polynomial image decimation and its application to non-rigid registration**, Amir Badshah, Paul L. O'Leary, Matthew J. Harker, Montan Univ. Leoben (Austria) . . . . . .[7877-06]

12:10 pm: **Interactive image quantification tools for knowledge capture in nuclear material forensics**, Reid B. Porter, Christy Ruggiero, Los Alamos National Lab. (United States). . . . . .[7877-07]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 3

**Sandpebble Room C . . . . . Wed. 2:00 to 3:20 pm**

### Outdoor Vision

*Session Chair*: **David Fofi,** Univ. de Bourgogne (France)

2:00 pm: **Line segment based structure and motion from two views**, Saleh Mosaddegh, Amir Fazlollahi, David Fofi, Univ. de Bourgogne (France); Pascal Vasseur, Univ. de Picardie Jules Verne (France) [7877-28]

2:20 pm: **Vision based forest smoke detection using analyzing of temporal patterns of smoke and their probability models**, Sun-Jae Ham, Eun-Hye Jung, ByoungChul Ko, Keimyung Univ. (Korea, Republic of) . . . . . .[7877-09]

2:40 pm: **Estimation of fire volume by stereovision**, Thierry Molinier, Lucile Rossi, Alain Pieri, Univ. di Corsica Pasquale Paoli (France); Moulay A. Akhloufi, Ctr. of Robotics and Vision (Canada); Yves Tison, Univ. di Corsica Pasquale Paoli (France) . . . . . .[7877-10]

3:00 pm: **Pavement distress detection and severity analysis**, Ezzatollah Salari, Guanqun Bao, The Univ. of Toledo (United States) . . . . . .[7877-11]

Coffee Break . . . . . 3:20 to 4:00 pm

## SESSION 4

**Sandpebble Room C . . . . . Wed. 4:00 to 5:20 pm**

### Features and Pattern Recognition

*Session Chair*: **David Fofi,** Univ. de Bourgogne (France)

4:00 pm: **Speed up face recognition with the use of limited physiological characteristics and SURF**, Dakshina R. Kisku, Asansol Engineering College (India); Phalguni Gupta, Indian Institute of Technology Kanpur (India); Jamuna K. Sing, Jadavpur Univ. (India) . . . . . .[7877-12]

4:20 pm: **Palmprint verification using Lagrangian decomposition and invariant interest points**, Dakshina R. Kisku, Asansol Engineering College (India); Phalguni Gupta, Indian Institute of Technology Kanpur (India); Jamuna K. Sing, Jadavpur Univ. (India) . . . . . .[7877-13]

4:40 pm: **Multi-frame face recognition with a discriminant analysis and decision level fusion**, Seokwon Yeom, Hyoung Lee, Daegu Univ. (Korea, Republic of) . . . . . .[7877-14]

5:00 pm: **Pose-robust face recognition using shape-adapted texture features**, Thorsten Gernoth, André Goossen, Rolf-Rainer Grigat, Technische Univ. Hamburg-Harburg (Germany) . . . . . .[7877-15]

# Thursday 27 January

## SESSION 5

**Sandpebble Room C . . . . . Thurs. 8:30 to 9:10 am**

### Medical Imaging

*Session Chair*: **David Fofi,** Univ. de Bourgogne (France)

8:30 am: **A novel framework for white blood cell segmentation based on stepwise rules and morphological features**, Ja-Won Gim, Juno Park, Ji-Hyun Lee, ByoungChul Ko, Jae-Yeal Nam, Keimyung Univ. (Korea, Republic of) . . . . . .[7877-16]

8:50 am: **Contour extraction and amendments of left ventricle short axis from heart ultrasonic image sequences**, Xiuzhi Yang, Chongqing Univ. of Posts and Telecommunications (China). . . . . .[7877-17]

## SESSION 6

**Sandpebble Room C . . . . . Thurs. 9:10 to 10:10 am**

### Machine Vision and Industrial Applications I

*Session Chair*: **Philip R. Bingham,** Oak Ridge National Lab.

9:10 am: **Non-parametric texture defect detection using Weibull features**, Fabian Timm, Univ. zu Lübeck (Germany) and Pattern Recognition Co. GmbH (Germany); Erhardt Barth, Univ. zu Lübeck (Germany) . . . . . .[7877-18]

9:30 am: **Machine vision applied to industrial quality control of artificial teeth: lighting methodology and image enhancement**, John W. Branch, Univ. Nacional de Colombia Sede Medellín (Colombia); Alejandro Restrepo-Martínez, Instituto Tecnológico Metropolitano (Colombia); Elizabeth Mesa-Múnera, Juan F. Ramírez-Salazar, Pedro Atencio, Esteban Franco, Univ. Nacional de Colombia Sede Medellín (Colombia); Omar Franco, Rosaura Carmona, Henry Rodriguez, New Stetic S.A. (Colombia) . . . . . .[7877-19]

9:50 am: **Quantitative measurement by artificial vision of small bubbles in flowing mercury**, Vincent C. Paquit, Mark W. Wendel, David K. Felde, Oak Ridge National Lab. (United States). . . . . .[7877-25]

Coffee Break . . . . . .10:10 to 10:50 am

## SESSION 7

**Sandpebble Room C . . . . . Thurs. 11:10 am to 12:50 pm**

### Machine Vision and Industrial Applications II

*Session Chair*: **David Fofi,** Univ. de Bourgogne (France)

11:10 am: **Coded source neutron imaging**, Philip R. Bingham, Oak Ridge National Lab. (United States). . . . . .[7877-21]

11:30 am: **Towards autonomic computing in machine vision applications: techniques and strategies for in-line 3D reconstruction in harsh industrial environments**, Julio Molleda, Rubén Usamentiaga, Daniel F. García, Francisco G. Bulnes, Univ. de Oviedo (Spain). .[7877-22]

11:50 am: **Evaluating distances using a coded lens camera and blur metrics**, Ludovic Angot, Chuan-Chung Chang, Yung-Lin Chen, Industrial Technology Research Institute (Taiwan) . . . . . .[7877-23]

12:10 pm: **Automatic firearm class identification from cartridge cases,** Sridharan Kamalakannan, Texas Tech Univ. (United States); Christopher J. Mann, Philip R. Bingham, Thomas P. Karnowski, Shaun S. Gleason, Oak Ridge National Lab. (United States); Hamed Sari-Sarraf, Texas Tech Univ. (United States). . . . . .[7877-24]

12:30 pm: **Generation of biologically motivated artificial retina tessellations log (z) and log (z+a) and Point based matching performance evaluation on backprojected response (V1) on retina domain**, Indradeo Ram, Paul Siebert, Univ. of Glasgow (United Kingdom) . . . . . .[7877-34]

Monday-Tuesday 24-25 January 2011 • Proceedings of SPIE Vol. 7878

# Intelligent Robots and Computer Vision XXVIII: Algorithms and Techniques



## Monday 24 January

### SESSION 1

**Sandpebble Room C . . . . . Mon. 8:50 to 10:20 am**

#### Invited Papers on Intelligent Robots

*Session Chair*: **Juha Röning,** Univ. of Oulu (Finland)

8:50 am: **Software framework for nano and micro scale measurement applications** *(Invited Paper)*, Juha Röning, Ville Tuhkanen, Risto Sipola, Tero J. Vallius, Univ. of Oulu (Finland). . . . . .[7878-01]

9:20 am: **A traffic situation analysis system** *(Invited Paper)*, Oliver Sidla, SLR Engineering OG (Austria); Michael Ulm, Austrian Institute of Technology (Austria); Marcin Rosner, SLR Engineering OG (Austria); Norbert Braendle, Austrian Institute of Technology (Austria) . . . .[7878-02]

9:50 am: **The 18 th Annual Intelligent Ground Vehicle Competition: trends and influences for intelligent ground vehicle control** *(Invited Paper)*, Bernard L. Theisen, William Smuda, Philip A. Frederick, U.S. Army Tank Automotive Research, Development and Engineering Ctr. (United States) . . . . . .[7878-03]

Coffee Break . . . . . .10:20 to 10:50 am

### SESSION 2

**Sandpebble Room C . . . . . Mon. 10:50 am to 12:10 pm**

#### Stereovision and Applications

*Session Chair*: **Juha Röning,** Univ. of Oulu (Finland)

10:50 am: **Stereo matching based on two cameras and one 3D image sensor**, Lu Yang, Xiaowei Shao, Ryosuke Shibasaki, The Univ. of Tokyo (Japan); Rongben Wang, Jilin Univ. (China) . . . . . .[7878-04]

11:10 am: **Linear stereo vision based objects detection and tracking using spectral clustering**, Safaa Moqqaddem, Y. Ruichek, Univ. of Technology of Belfort-Montbéliard (France); R. Touahni, A. Sbihi, Ibn Tofail Univ. of Kénitra (Morocco). . . . . .[7878-06]

11:30 am: **Implementation of stereo vision on GPU for intelligent ground vehicle navigation in the presence of obstacles**, Chris Gamache, Taskin Padir, Worcester Polytechnic Institute (United States) . . . . . .[7878-07]

11:50 am: **Probabilistic recognition of person reoccurrence for visual surveillance of pedestrian flows**, Lucas Paletta, Gerald Fritz, JOANNEUM RESEARCH Forschungsgesellschaft mbH (Austria) [7878-08]

Lunch Break . . . . . 12:10 to 2:00 pm

### SESSION 3

**Sandpebble Room C . . . . . Mon. 2:00 to 3:40 pm**

#### Novel People and Vehicle Tracking Approaches

*Session Chair*: **Oliver Sidla,** SLR Engineering OG (Austria)

2:00 pm: **A multimodal eye tracking system for studies of embodied attention**, Lucas Paletta, Alexander Almer, Gerald Fritz, Katrin Amlacher, Patrick Luley, Stefan Ladstätter, JOANNEUM RESEARCH Forschungsgesellschaft mbH (Austria) . . . . . .[7878-09]

2:20 pm: **Real-time car detection system**, Marcin Rosner, SLR Engineering OG (Austria). . . . . .[7878-10]

2:40 pm: **Real-time people and vehicle detection from UAV imagery**, Anna Gaszczak, Toby Breckon, Jiwan Han, Cranfield Univ. (United Kingdom). . . . . .[7878-11]

3:00 pm: **Real-time pose invariant logo and pattern detection**, Oliver Sidla, SLR Engineering OG (Austria) . . . . . .[7878-12]

3:20 pm: **FirstAidAssistanceSystem: improvement of first aid measures by using Car2Car-communication**, Sven Tuchscheerer, Tobias Hoppe, Christian Kraetzer, Jana Dittmann, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . . . .[7878-13]

Coffee Break . . . . . 3:40 to 4:00 pm

### SESSION 4

**Sandpebble Room C . . . . . Mon. 4:00 to 5:20 pm**

#### Tracking Methods for Intelligent Robots

*Session Chairs*: **Terrell N. Mundhenk,** HRL Labs., LLC; **Ernest L. Hall,** Univ. of Cincinnati

4:00 pm: **The report of estimating the egomotion of the moving stereo cameras in the environment including moving objects and reconstructing the observed space in 3D**, Naotomo Tatematsu, Jun Ohya, Waseda Univ. (Japan). . . . . .[7878-14]

4:20 pm: **A multiple feature based particle filter using mutual information maximization**, Kihyun Hong, Kyuseo Han, Purdue Univ. (United States). . . . . .[7878-15]

4:40 pm: **High precision object segmentation and tracking for use in super-resolution video reconstruction**, Terrell N. Mundhenk, Rashmi N. Sundareswara, Yang Chen, HRL Labs., LLC (United States) . . . .[7878-16]

5:00 pm: **Robust pedestrian detection and tracking from a moving vehicle**, Nguyen Xuan Tuong, Nanyang Technological Univ. (Singapore); Thomas Müller, Alois Knoll, Technische Univ. München (Germany) . . . . . .[7878-17]

## Tuesday 25 January

**Grand Peninsula Ballroom A . . . . . Tues. 8:20 to 9:20 am**

### Plenary Session and Society Award Presentations

8:25 am: **New Dimensions in Visual Quality**, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

## SESSION 5

**Sandpebble Room C . . . . . Tues. 9:30 to 10:50 am**

### Human Robot Interaction and Manipulation

*Session Chair*: **Oliver Sidla,** SLR Engineering OG (Austria)

9:30 am: **Design and evaluation of security multimedia warnings for interaction between human and industrial robots**, Jana Fruth, Jana Dittmann, Christian Krätzer, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . . . .[7878-18]

9:50 am: **Dual mode fingertip guiding manipulator for blind persons enabling passive/active line-drawing explorations to create mental images**, Syed Najib Syed Yusoh, Mie Univ. (Japan) . . . . . .[7878-19]

10:10 am: **Augmented reality user interface for mobile ground robots with manipulator arms**, Steven Vozar, Dawn Tilbury, Univ. of Michigan (United States). . . . . .[7878-20]

10:30 am: **An embedded omnidirectional vision nmavigator for automatic guided vehicles**, Weijia Feng, Tianjin Univ. (China); Baofeng Zhang, Zuoliang Cao, Xiaoning Zong, Tianjin Univ. of Technology (China); Juha Röning, Univ. of Oulu (Finland). . . . . .[7878-21]

Coffee Break . . . . . .10:50 to 11:10 am

## SESSION 6

**Sandpebble Room C . . . . . .Tues. 11:10 am to 12:30 pm**

### Vision Navigation and Target Detection

*Session Chair*: **Bernard L. Theisen,** U.S. Army Tank Automotive Research, Development and Engineering Ctr.

11:10 am: **Detecting stationary human targets in FLIR imagery**, Alex L. Chan, U.S. Army Research Lab. (United States). . . . . .[7878-23]

11:30 am: **Spectrally queued feature selection for robotic visual odometery**, Philip A. Frederick, U.S. Army Tank Automotive Research, Development and Engineering Ctr. (United States); David Pirozzo, Booz Allen Hamilton (United States); Michael S. Del Rose, U.S. Army Tank Automotive Research, Development and Engineering Ctr. (United States) . . . . . .[7878-24]

11:50 am: **Intuitive control of robotic manipulators**, David Rusbarsky, RE2, Inc. (United States); Jeremy P. Gray, U.S. Army Tank Automotive Research, Development and Engineering Ctr. (United States); Douglas J. Peters, RE2, Inc. (United States). . . . . .[7878-25]

12:10 pm: **Vision based low cost, precise, and robust localization method in GPS denied environments**, Jacqueline Walter, U.S. Army Tank Automotive Research, Development and Engineering Ctr. (United States); Darrin C. Bentivegna, Seegrid Corp. (United States) . . . . . .[7878-26]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 7

**Sandpebble Room C . . . . . Tues. 2:00 to 3:20 pm**

### Visual Algorithms

*Session Chairs*: **Ernest L. Hall,** Univ. of Cincinnati; **Zuoliang Cao,** Tianjin Univ. of Technology (China)

2:00 pm: **Curved solid and dotted line characters segmentation and classification**, Khader Mohammad, Sos S. Agaian, Hani Saleh, The Univ. of Texas at San Antonio (United States) . . . . . .[7878-27]

2:20 pm: **Accelerating robust 3D pose estimation utilizing a graphics processing unit**, Adam R. Gerlach, Bruce K. Walker, Univ. of Cincinnati (United States). . . . . .[7878-28]

2:40 pm: **Calibration and rectification research for fish-eye lens application**, Weijia Feng, Tianjin Univ. (China); Baofeng Zhang, Zuoliang Cao, Xiaoning Zong, Tianjin Univ. of Technology (China); Juha Röning, Univ. of Oulu (Finland) . . . . . .[7878-29]

3:00 pm: **A hardware-software co-design approach to a JPEG encoder design for a planetary micro-rover application**, Santanu Sarma, K. Parameswaran, S. Udupa, K. M. Bharadwaj, Indian Space Research Organisation (India) . . . . . .[7878-30]

Coffee Break . . . . . 3:20 to 4:00 pm

## SESSION 8

**Sandpebble Room C . . . . . Tues. 4:00 to 5:00 pm**

### Intelligent Ground Vehicle Competition

*Session Chair*: **Bernard L. Theisen,** U.S. Army Tank Automotive Research, Development and Engineering Ctr.

4:00 pm: **Phobetor: Princeton University's entry in the 2010 Intelligent Ground Vehicle Competition**, Joshua Newman, Solomon O. Abiola, Ryan M. Corey, Srinivasan A. Suresh, Laszlo J. Szocs, Brenton A. Partridge, Derrick D. Yu, Han Zhu, Princeton Univ. (United States) . . . . . .[7878-31]

4:20 pm: **Application of parallelized software architecture to an autonomous ground vehicle**, Rahul Shakya, Adam Wright, Young Ho Shin, Orko Momin, Steve Petkovsek, Paul Wortman, Prasanna Gautam, Adam Norton, Trinity College (United States) . . . . . .[7878-32]

4:40 pm: **WOAH: an obstacle avoidance technique for high speed path following,** Nat Tuck, Michael McGuinness, Fred W. Martin, Univ. of Massachusetts Lowell (United States) . . . . . .[7878-33]

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Continuous target tracking based on multiple views**, Yahui Liu, Beijing Univ. of Posts and Telecommunications (China). . . . . .[7878-35]

**A target detection method in multimodal images with complex backgrounds and different views**, Zhixiang He, Xiaoqing Ding, Tsinghua Univ. (China) . . . . . .[7878-36]

**Gender classification robust to face pose variation and partial occlusion**, Pingping Zeng, Nanchang Univ. (China); Yu-Jin Zhang, Tsinghua Univ. (China). . . . . .[7878-37]

**Lane marking detection by extracting white regions with predefined width from bird's-eye road images**, Sadayuki Abe, Utsunomiya Univ. (Japan). . . . . .[7878-38]

**Selective locality preserving projections for face recognition**, Fadi Dornaika, Univ. of the Basque Country (Spain); Ammar Assoum, Lebanese Univ. (Lebanon) . . . . . .[7878-39]

# Conference 7879

Wednesday-Thursday 26-27 January 2011 • Proceedings of SPIE Vol. 7879

# Imaging and Printing in a Web 2.0 World II

*Conference Chairs:* **Qian Lin,** Hewlett-Packard Labs.; **Jan P. Allebach,** Purdue Univ.; **Zhigang Fan,** Xerox Corp.

*Program Committee:* **Patricia Albanese,** Rochester Institute of Technology; **Kathrin Berkner,** Ricoh Innovations, Inc.; **Susanne C. J. Boll,** Univ. of Oldenburg (Germany); **Jerry Liu,** Hewlett-Packard Labs.; **Jiebo Luo,** Eastman Kodak Co.; **Robert J. Rolleston,** Xerox Corp.; **David N. Slatter,** Hewlett-Packard Labs. (United Kingdom); **Yonghong Tian,** Beijing Univ. (China); **Wiley H. Wang,** Shutterfly; **Shengjin Wang,** Tsinghua Univ. (China)

## Wednesday 26 January

**Grand Peninsula Ballroom A . . . . . Wed. 8:20 to 9:20 am**

### Plenary Session and Conference Award Presentations

8:25 am: **Problems in Biological Imaging: Opportunities for Signal Processing**, Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[EI11SE-102]

## SESSION 1

**Sandpebble Room D . . . . . Wed. 9:30 to 10:30 am**

### Web Printing and Publishing I

*Session Chair*: **Qian Lin,** Hewlett-Packard Labs.

9:30 am: **Web-based magazine design for self publishers**, Andrew A. Hunter, David N. Slatter, Hewlett-Packard Labs. (United Kingdom) . . . . . .[7879-01]

9:50 am: **Improve artwork design through data tracking system**, Wiley H. Wang, Russ Muzzolini, Shutterfly, Inc. (United States). . . . . .[7879-02]

10:10 am: **DOM-based print-link detection for web article extraction**, Sam J. Liu, Suk Hwan Lim, Jerry Liu, Hewlett-Packard Labs. (United States) . . . . . .[7879-03]

Coffee Break . . . . . .10:30 to 11:00 am

## SESSION 2

**Sandpebble Room D . . . . . Wed. 11:00 am to 12:30 pm**

### Web Printing and Publishing II

*Session Chair*: **Kathrin Berkner,** Ricoh Innovations, Inc.

11:00 am: **How Web 2.0 technologies lead to more tangible printed output** *(Invited Paper)*, Reiner Fageth, CeWe Color AG & Co. OHG (Germany) . . . . . .[7879-16]

11:30 am: **A web-based troubleshooting tool to help customers self-solve color issues with a digital printing workflow**, Hector J. Santos-Villalobos, Purdue Univ. (United States); Victor Loewen, Hewlett-Packard Co. (United States); Mark R. Letho, Jan P. Allebach, Purdue Univ. (United States) . . . . . .[7879-05]

11:50 am: **Language-based color editing for mobile device**, Yonghui Zhao, Raja Bala, Karen M. Braun, Zahra Langford, Robert J. Rolleston, Xerox Corp. (United States). . . . . .[7879-06]

12:10 pm: **Personalized imaging: moving closer to reality**, Hengzhou Ding, Purdue Univ. (United States); Raja Bala, Zhigang Fan, Xerox Corp. (United States); Charles A. Bouman, Jan P. Allebach, Purdue Univ. (United States) . . . . . .[7879-07]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 3

**Sandpebble Room D . . . . . Wed. 2:00 to 3:20 pm**

### Web Design and Layout Analysis

*Session Chair*: **Jerry Liu,** Hewlett-Packard Labs.

2:00 pm: **Document distance measures and document browsing**, Ildus Ahmadullin, Purdue Univ. (United States); Jian Fan, Niranjan Damera-Venkata, Suk Hwan Lim, Qian Lin, Jerry Liu, Sam J. Liu, Eamonn O'Brien-Strain, Hewlett-Packard Labs. (United States); Jan P. Allebach, Purdue Univ. (United States) . . . . . .[7879-08]

2:20 pm: **Adaptive removal of background and white space from document images using seam categorization**, Claude S. Fillion, Zhigang Fan, Xerox Corp. (United States). . . . . .[7879-09]

2:40 pm: **Aesthetic role of transparency and layering in the creation of a photo layout**, Maria V. Ortiz Segovia, Purdue Univ. (United States); Niranjan Damera-Venkata, Eamonn O'Brien-Strain, Jian Fan, Suk Hwan Lim, Sam J. Liu, Jerry Liu, Qian Lin, Hewlett-Packard Labs. (United States); Jan P. Allebach, Purdue Univ. (United States) . . . . . .[7879-10]

3:00 pm: **Automatic picture orientation detection based on classifier combination**, Changsong Liu, Yuejia Sun, Xiaoqing Ding, Tsinghua Univ. (China) . . . . . .[7879-11]

Coffee Break . . . . . 3:20 to 4:00 pm

## SESSION 4

**Sandpebble Room D . . . . . Wed. 4:00 to 5:20 pm**

### Digital Libraries/Information Sharing

*Session Chair*: **Wiley H. Wang,** Shutterfly

4:00 pm: **Whiteboard sharing: capture, process, and print or email**, Michael J. Gormish, Berna Erol, Daniel G. Van Olst, Tim Li, Andrea Mariotti, Ricoh Innovations, Inc. (United States) . . . . . .[7879-12]

4:20 pm: **Building a print on demand web service**, Prakash D. Reddy, Hewlett-Packard Labs. (United States); Benedict Rozario, V. Anil Dev, Shariff Dudekula, Hewlett-Packard Labs. India (India) . . . . . .[7879-13]

4:40 pm: **An unsupervised fusion method for large scale cross-media meta-search engine with clickthrough data**, Yali Cao, Yonghong Tian, Tiejun Huang, Wen Gao, Peking Univ. (China) . . . . . .[7879-14]

5:00 pm: **iULib: where UDL and Wikipedia could meet**, Yonghong Tian, Tiejun Huang, Wen Gao, Peking Univ. (China) . . . . . .[7879-15]

## Thursday 27 January

## SESSION 5

**Sandpebble Room D . . . . . Thurs. 8:30 to 10:10 am**

### Web Content Analysis and Understanding I

*Session Chair*: **Zhigang Fan,** Xerox Corp.

8:30 am: **Book Widget: embedding automated photo-document publication on the web and in mobile devices**, Eamonn O'Brien-Strain, Hewlett-Packard Labs. (United States); Andrew A. Hunter, Hewlett-Packard Labs. (United Kingdom); Jerry Liu, Qian Lin, Daniel Tretter, Hewlett-Packard Labs. (United States); Jiayan Wang, Hewlett-Packard Labs. China (China); Xuemei Zhang, Hewlett-Packard Labs. (United States) . . . . . .[7879-04]

8:50 am: **Semantic photo books: leveraging blogs and social media for photo book creation**, Mohamad Rabbath, Philipp Sandhaus, OFFIS e.V. (Germany); Susanne C. J. Boll, Carl von Ossietzky Univ. Oldenburg (Germany) . . . . . .[7879-17]

9:10 am: **Automatic image selection scheme utilizing comments for insertion of images into weblogs**, Tomoaki Konno, Emi Myodo, Koichi Takagi, Ryoichi Kawada, KDDI R&D Labs., Inc. (Japan) . . . . . .[7879-18]

9:30 am: **Title identification of web article pages using html and visual features**, Jian Fan, Hewlett-Packard Labs. (United States); Ping Luo, Hewlett-Packard Labs. China (China); Parag Joshi, Hewlett-Packard Labs. (United States) . . . . . .[7879-19]

9:50 am: **Creating 3D realistic head: from two orthogonal photos to multiview face contents**, Yuan Lin, Tsinghua Univ. (China); Qian Lin, Feng Tang, Hewlett-Packard Labs. (United States); Liang Tang, Hewlett-Packard Labs. China (China); Suk Hwan Lim, Hewlett-Packard Labs. (United States); Shengjin Wang, Tsinghua Univ. (China) . . . . . .[7879-20]

Coffee Break . . . . . .10:10 to 10:40 am

## SESSION 6

**Sandpebble Room D . . . . . Thurs. 10:40 am to 12:30 pm**

### Web Content Analysis and Understanding II

*Session Chair*: **Jan P. Allebach,** Purdue Univ.

10:40 am: **Mobile multimedia understanding applications: an overview** *(Invited Paper)*, Xiaofan Lin, Vobile, Inc. (United States) . . . . . .[7879-21]

11:10 am: **Learning object detectors from web image search**, Feng Tang, Daniel Tretter, Hewlett-Packard Labs. (United States) . . . .[7879-22]

11:30 am: **Image categorization for marketing purposes**, Mishari I. Almishari, Haengju Lee, Nathan Gnanasambandam, Xerox Corp. (United States) . . . . . .[7879-23]

11:50 am: **Text extraction from web images**, Changsong Liu, Cheng Yang, Xiaoqing Ding, Tsinghua Univ. (China) . . . . . .[7879-24]

12:10 pm: **Web image annotation using two-step filtering on social tags**, Sunyoung Cho, Jaeseong Cha, Hyeran Byun, Yonsei Univ. (Korea, Republic of) . . . . . .[7879-25]

# Conference 7880

Monday-Wednesday 24-26 January 2011 • Proceedings of SPIE Vol. 7880

# Media Watermarking, Security, and Forensics XIII

*Conference Chairs:* **Nasir D. Memon,** Polytechnic Institute of NYU; **Jana Dittmann,** Otto-von-Guericke-Univ. Magdeburg (Germany); **Adnan M. Alattar,** Digimarc Corp.; **Edward J. Delp III,** Purdue Univ.

*Program Committee:* **Mauro Barni,** Univ. degli Studi di Siena (Italy); **Jeffrey A. Bloom,** Dialogic Media Labs; **Patrick Bas,** Ecole Nationale Supérieure de Physique de Grenoble (France); **Hany Farid,** Dartmouth College; **Jessica Fridrich,** Binghamton Univ.; **Jiwu Huang,** Sun Yat-Sen Univ. (China); **Ton Kalker,** Hewlett-Packard Co.; **Andrew D. Ker,** Univ. of Oxford (United Kingdom); **Alex Chichung Kot,** Nanyang Technological Univ. (Singapore); **Benoît M. Macq,** Univ. Catholique de Louvain (Belgium); **Bangalore Manjunath,** Univ. of California, Santa Barbara; **Pierre Moulin,** Univ. of Illinois at Urbana-Champaign; **Dulce B. Ponceleon,** IBM Almaden Research Ctr.; **Regunathan Radhakrishnan,** Dolby Labs., Inc.; **Husrev Taha Sencar,** TOBB Ekonomi ve Teknoloji Üniv. (Turkey); **Gaurav Sharma,** Univ. of Rochester; **Claus Vielhauer,** Otto-von-Guericke-Univ. Magdeburg (Germany); **Svyatoslav V. Voloshynovskiy,** Univ. of Geneva (Switzerland); **Min Wu,** Univ. of Maryland, College Park; **Chang D. Yoo,** Korea Advanced Institute of Science and Technology (Korea, Republic of)

*Cosponsored by:* DIGITAL WATERMARKING ALLIANCE

## Monday 24 January

### SESSION 1

**Harbour Room B . . . . . Mon. 8:20 to 9:20 am**

#### Keynote Presentation I

8:20 am: **Signal rich art: enabling the vision of ubiquitous computing**, Bruce Davis, Digimarc Corp. (United States) . . . . . .[7880-01]

### SESSION 2

**Harbour Room B . . . . . Mon. 9:20 to 10:10 am**

#### Security

*Session Chair*: **Scott A. Craver,** Binghamton Univ.

9:20 am: **Comparison of three solutions to correct erroneous blocks to extract an image of a multiplicative homomorphic cryptosystem**, Naveed Islam, William Puech, Robert Brouzet, LIRMM (France) .[7880-02]

9:45 am: **Homomorphic encryption-based secure SIFT for privacy-preserving feature extraction**, Chao-Yong Hsu, Chun-Shien Lu, Academia Sinica (Taiwan); Soo-Chang Pei, National Taiwan Univ. (Taiwan) . . . . . .[7880-03]

Coffee Break . . . . . .10:10 to 10:40 am

### SESSION 3

**Harbour Room B . . . . . Mon. 10:40 am to 12:20 pm**

#### Forensics I

*Session Chair*: **Gaurav Sharma,** Univ. of Rochester

10:40 am: **Determining approximate age of digital images using sensor defects**, Miroslav Goljan, Jessica Fridrich, Binghamton Univ. (United States) . . . . . .[7880-04]

11:05 am: **Performance comparison of denoising filters for source camera identification**, Andrea Cortiana, Valentina Conotter, Giulia Boato, Francesco G. B. De Natale, Univ. degli Studi di Trento (Italy). . . .[7880-05]

11:30 am: **Identifying image forgeries using change point detection**, Babak Mahdian, Stanislav Saic, Institute of Information Theory and Automation (Czech Republic) . . . . . .[7880-06]

11:55 am: **Enhancing ROC performance of trustworthy camera source identification**, Xiangui Kang, Yinxiang Li, Zhenhua Qu, Jiwu Huang, Sun Yat-Sen Univ. (China) . . . . . .[7880-07]

Lunch Break . . . . . 12:20 to 2:00 pm

### SESSION 4

**Harbour Room B . . . . . Mon. 2:00 to 3:40 pm**

#### Watermark I

*Session Chair*: **Adnan M. Alattar,** Digimarc Corp.

2:00 pm: **Using feature point-based extraction for STDM 3D-mesh watermarking that withstands the cropping attack**, Mireia Montañola Sales, Ir. Rony M. Darazi, Joachim Giard, Univ. Catholique de Louvain (Belgium); Patrice Rondao Alface, Alcatel-Lucent Bell Labs. (Belgium); Benoît M. Macq, Univ. Catholique de Louvain (Belgium) . . . . . .[7880-08]

2:25 pm: **a perceptually driven hybrid additive-multiplicative watermarking technique in the wavelet domain**, Florent Autrusseau, Sylvain David, Vinod Pankajakshan, Univ. de Nantes (France); Patrizio Campisi, Univ. degli Studi di Roma Tre (Italy) . . . . . .[7880-09]

2:50 pm: **Assessment of camera phone distortion and implications for watermarking**, Aparna Gurijala, Alastair M. Reed, Eric Evans, Digimarc Corp. (United States) . . . . . .[7880-10]

3:15 pm: **A new metric for measuring the visual quality of video watermarks**, Daniel Trick, Technische Univ. Darmstadt (Germany); Stefan Thiemert, Fraunhofer-Institut für Sichere Informations-Technologie (Germany) . . . . . .[7880-11]

Coffee Break . . . . . 3:40 to 4:00 pm

### SESSION 5

**Harbour Room B . . . . . Mon. 4:00 to 5:15 pm**

#### Steganography

*Session Chair*: **Jessica Fridrich,** Binghamton Univ.

4:00 pm: **A curiosity regarding steganographic capacity of pathologically nonstationary sources**, Andrew D. Ker, Univ. of Oxford (United Kingdom). . . . . .[7880-12]

4:25 pm: **Design of adaptive steganographic schemes for digital images in spatial domain**, Tomas Filler, Jessica Fridrich, Binghamton Univ. (United States) . . . . . .[7880-13]

4:50 pm: **Feature restoration and distortion metrics**, Ventsislav Chonev, Andrew D. Ker, Univ. of Oxford (United Kingdom) . . . . . .[7880-14]

## Tuesday 25 January

**Grand Peninsula Ballroom A . . . . . Tues. 8:20 to 9:20 am**

#### Plenary Session and Society Award Presentations

8:25 am: **New Dimensions in Visual Quality**, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

## SESSION 6

**Harbour Room B . . . . . Tues. 9:30 to 10:30 am**

### Keynote Presentation II

9:30 am: **Image and video manipulation: Past, present, and future**, , . . . . . .[7880-15]

Coffee Break . . . . . .10:30 to 11:10 am

## SESSION 7

**Harbour Room B . . . . . .Tues. 11:10 am to 12:00 pm**

### Watermark II

11:10 am: **Lossless image data embedding in plain areas**, Mehdi Fallahpour, David Megias, Univ. Oberta de Catalunya (Spain); Yun Q. Shi, New Jersey Institute of Technology (United States) . . . . . .[7880-16]

11:35 am: **Re-synchronizing audio watermarking after nonlinear time stretching**, Martin Steinebach, Sascha Zmudzinski, Fraunhofer-Institut für Sichere Informations-Technologie (Germany). . . . . .[7880-17]

Lunch Break . . . . . 12:00 to 2:00 pm

## SESSION 8

**Harbour Room B . . . . . Tues. 2:00 to 3:15 pm**

### Steganalysis I

*Session Chair*: **Andrew D. Ker,** Univ. of Oxford (United Kingdom)

2:00 pm: **On locating steganographic payload using residuals**, Tu-Thach Quach, Sandia National Labs. (United States) . . . . . .[7880-19]

2:25 pm: **Steganalysis using logistic regression**, Ivans Lubenko, Andrew D. Ker, Univ. of Oxford (United Kingdom) . . . . . .[7880-20]

2:50 pm: **Steganalysis in high dimensions: fusing classifiers built on random subspaces**, Jan Kodovsky, Jessica Fridrich, Binghamton Univ. (United States). . . . . .[7880-21]

Coffee Break . . . . . 3:15 to 3:45 pm

## SESSION 9

**Harbour Room B . . . . . Tues. 3:45 to 5:00 pm**

### Content Identification I

*Session Chair*: **Regunathan Radhakrishnan,** Dolby Labs., Inc.

3:45 pm: **Private content identification based on soft fingerprinting**, Svyatoslav V. Voloshynovskiy, Taras S. Holotyak, Oleksiy J. Koval, Fokko P. Beekhof, Univ. of Geneva (Switzerland) . . . . . .[7880-22]

4:10 pm: **Geometrically robust perceptual fingerprinting: an asymmetric case**, Oleksiy J. Koval, Svyatoslav V. Voloshynovskiy, Univ. of Geneva (Switzerland). . . . . .[7880-23]

4:35 pm: **Trade-offing privacy-complexity of identification problem**, Taras S. Holotyak, Svyatoslav V. Voloshynovskiy, Oleksiy J. Koval, Fokko P. Beekhof, Univ. of Geneva (Switzerland) . . . . . .[7880-24]

# Wednesday 26 January

**Grand Peninsula Ballroom A . . . . . .Wed. 8:20 to 9:20 am**

### Plenary Session and Conference Award Presentations

8:25 am: **Problems in Biological Imaging: Opportunities for Signal Processing**, Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[EI11SE-102]

## SESSION 10

**Harbour Room B . . . . . Wed. 9:30 to 10:45 am**

### Forensics II

*Session Chair*: **Hany Farid,** Dartmouth College

9:30 am: **A context model for microphone forensics and its application in evaluations**, Christian Krätzer, Kun Qian, Maik Schott, Jana Dittmann, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . . . .[7880-25]

9:55 am: **Double H.264/AVC compression detection using quantized nonzero AC coefficients**, Dandan Liao, Rui Yang, Hongmei Liu, Sun Yat-Sen Univ. (China). . . . . .[7880-26]

10:20 am: **Forensic printer detection using intrinsic signatures**, Aravind K. Mikkilineni, Nitin Khanna, Edward J. Delp III, Purdue Univ. (United States) . . . . . .[7880-27]

Coffee Break . . . . . .10:45 to 11:10 am

## SESSION 11

**Harbour Room B . . . . . Wed. 11:10 am to 12:25 pm**

### Steganalysis II

*Session Chair*: **Chad D. Heitzenrater,** Air Force Research Lab.

11:10 am: **Non-destructive forensic latent fingerprint acquisition with chromatic white light sensors**, Marcus Leich, Stefan Kiltz, Jana Dittmann, Claus Vielhauer, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . . . .[7880-28]

11:35 am: **Detecting messages of unknown length**, Tomas Pevny, Czech Technical Univ. in Prague (Czech Republic) . . . . . .[7880-29]

12:00 pm: **A new paradigm for steganalysis via clustering**, Andrew D. Ker, Univ. of Oxford (United Kingdom); Tomas Pevny, Czech Technical Univ. in Prague (Czech Republic) . . . . . .[7880-30]

Lunch Break . . . . . 12:25 to 2:00 pm

## SESSION 12

**Harbour Room B . . . . . Wed. 2:00 to 3:15 pm**

### Content Identification II

*Session Chair*: **Ton Kalker,** Hewlett-Packard Co.

2:00 pm: **Collusion-secure patchwork embedding for transaction watermarking**, Waldemar Berchtold, Sascha Zmudzinski, Marcel Schäfer, Martin Steinebach, Fraunhofer-Institut für Sichere Informations-Technologie (Germany) . . . . . .[7880-31]

2:25 pm: **Probabilistic fingerprinting codes used to detect traitor zero-bit watermark**, Mathieu Desoubeaux, Gaëtan Le Guelvouit, Orange Labs. (France); William Puech, LIRMM (France) . . . . . .[7880-32]

2:50 pm: **Rihamark: perceptual image hash benchmarking**, Martin Steinebach, Fraunhofer-Institut für Sichere Informations-Technologie (Germany); Hermann Eckehard, Christoph Zauner, FH OÖ Studienbetriebs GmbH (Austria) . . . . . .[7880-33]

Coffee Break . . . . . 3:15 to 3:45 pm

## SESSION 13

**Harbour Room B . . . . . Wed. 3:45 to 5:00 pm**

### Miscellaneous

3:45 pm: **A spatio-temporal framework based on eigenvectors for improved face recognition**, Mourad Ouaret, Jean-Luc E. Dugelay, EURECOM (France). . . . . .[7880-34]

4:10 pm: **Contrast-enhancing and deterministic tone mapping method in natural image hiding scheme for entertainment applications**, Emi Myodo, Koichi Takagi, Ryoichi Kawada, KDDI R&D Labs., Inc. (Japan) . . . . . .[7880-35]

4:35 pm: **Toward the identification of DSLR lenses by chromatic aberration**, Jun Yu, Scott A. Craver, Enping Li, Binghamton Univ. (United States) . . . . . .[7880-36]

# Conference 7881A

Wednesday 26 January 2011 • Part of Proceedings of SPIE Vol. 7881

# Multimedia on Mobile Devices 2011

*Conference Chairs:* **David Akopian,** The Univ. of Texas at San Antonio; **Reiner Creutzburg,** Fachhochschule Brandenburg (Germany)

*Program Committee:* **Sos S. Agaian,** The Univ. of Texas at San Antonio; **Nina T. Bhatti,** Hewlett-Packard Labs.; **Faouzi Alaya Cheikh,** Gjøvik Univ. College (Norway); **Linda Breitlauch,** Mediadesign Hochschule Düsseldorf (Germany); **Chang Wen Chen,** Univ. at Buffalo; **Philip C. L. Chen,** The Univ. of Texas at San Antonio; **Kenneth J. Crisler,** Motorola, Inc.; **David S. Doermann,** Univ. of Maryland, College Park; **Elizabeth Dykstra-Erickson,** Kinoma; **Stefan Edlich,** Technische Fachhochschule Berlin (Germany); **Atanas P. Gotchev,** Tampere Univ. of Technology (Finland); **Lajos Hanzo,** Univ. of Southampton (United Kingdom); **Zhihai He,** Univ. of Missouri-Columbia; **Hendrik O. Knoche,** Univ. College London (United Kingdom); **Catalin Lacatus,** Telcordia Technologies, Inc.; **Xin Li,** West Virginia Univ.; **Manzur M. Murshed,** Monash Univ. (Australia); **Sethuraman Panchanathan,** Arizona State Univ.; **Kari A. Pulli,** Nokia Research Ctr.; **Matthias Rauterberg,** Technische Univ. Eindhoven (Netherlands); **Phillip A. Regalia,** TELECOM & Management SudParis (France); **Phanikrishna K. Sagiraju,** The Univ. of Texas at San Antonio; **Abhay Samant,** National Instruments (India); **Thomas Schwotzer,** FHTW (Germany); **Olli J. Silvén,** Univ. of Oulu (Finland); **Jarmo Henrik Takala,** Tampere Univ. of Technology (Finland); **Kaisa Anneli Väänänen-Vainio-Mattila,** Tampere Univ. of Technology (Finland); **Haitao Zheng,** Univ. of California, Santa Barbara

## Tuesday 25 January

**Grand Peninsula Ballroom A . . . . . Tues. 8:20 to 9:20 am**

**Plenary Session and Society Award Presentations**

8:25 am: **New Dimensions in Visual Quality**, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

## SESSION 1

**Bayside Room B. . . . . Tues. 9:30 to 10:40 am**

### Emerging Mobile Applications I

*Session Chairs*: **Reiner Creutzburg,** Fachhochschule Brandenburg (Germany); **David Akopian,** The Univ. of Texas at San Antonio

9:30 am: **Towards a multimedia remote viewer for mobile thin clients**, Mihai P. Mitrea, Bojan Joveski, Ludovico Gardenghi, TELECOM & Management SudParis (France); Pieter Simoens, IBBT (Belgium); Jamie Marshall, Prologue (France); Bert Vankeirsbilck, IBBT (Belgium); Françoise J. Prêteux, TELECOM & Management SudParis (France); Bart Dhoedt, IBBT (Belgium). . . . . [7881A-01]

9:50 am: **Multimodal sensing-based camera applications**, Miguel Bordallo Lopez, Jari Hannuksela, Olli J. Silvén, Univ. of Oulu (Finland); Markku Vehviläinen, Nokia Research Ctr. (Finland) . . . . . [7881A-02]

10:10 am: **A mobile service architecture for obesity prevention** *(Invited Paper)*, David Akopian, Varun Jayaram, Abhinav Kumar, The Univ. of Texas at San Antonio (United States); Cynthia Mojica, Deborah Parra-Medina, The Univ. of Texas Health Science Ctr. at San Antonio (United States) . . . . . [7881A-03]

Coffee Break . . . . . .10:40 to 11:00 am

## SESSION 2

**Bayside Room B. . . . . .Tues. 11:00 am to 12:30 pm**

### Data Processing and Evaluation for Mobile Applications

*Session Chairs*: **Reiner Creutzburg,** Fachhochschule Brandenburg (Germany); **Sos S. Agaian,** The Univ. of Texas at San Antonio

11:00 am: **Quality and noise measurements in mobile phone video capture** *(Invited Paper)*, Doina Petrescu, John Pincenti, Motorola, Inc. (United States). . . . . [7881A-04]

11:30 am: **3D scene reconstruction based on multiview distributed video coding in the Zernike domain for mobile applications**, Veronica Palma, Marco Carli, Alessandro Neri, Univ. degli Studi di Roma Tre (Italy) . . . . . [7881A-05]

11:50 am: **Psycho-physiological effects of head-mounted displays in ubiquitous use: a comparison of see-through and non-see-through, binocular, and monocular conditions**, Takashi Kawai, Waseda Univ. (Japan); Jukka P. Häkkinen, University of Helsinki (Finland) and Nokia Research Center (Finland) and Aalto University (Finland); Keisuke Oshima, Waseda University (Japan); Hiroko Saito, Takashi Yamazoe, Waseda Univ. (Japan); Hiroyuki Morikawa, Waseda University (Japan); Göte S. Nyman, University of Helsinki (Finland) . . . . . [7881A-06]

12:10 pm: **Progressive imagery with scalable vector graphics**, Georg A. Fuchs, Heidrun Schumann, Univ. Rostock (Germany); René U. Rosenbaum, Sr., Univ. of California, Davis (United States). . . . [7881A-07]

Lunch Break . . . . . 12:30 to 1:50 pm

## SESSION 3

**Bayside Room B. . . . . Tues. 1:50 to 4:40 pm**

### 3D Media for Mobile Devices

*Session Chairs*: **Atanas P. Gotchev,** Tampere Univ. of Technology (Finland); **Namho Hur,** Electronics and Telecommunications Research Institute (Korea, Republic of)

1:50 pm: **Mobile 3D quality of experience evaluation: a hybrid data collection and analysis approach** *(Invited Paper)*, Atanas P. Gotchev, Satu Jumisko-Pyykkö, Atanas R. Boev, Timo Utriainen, Jyrki Häyrynen, Maija Mikkola, Tampere Univ. of Technology (Finland); Miska Hannuksela, Nokia Research Ctr. (Finland) . . . . . [7881A-08]

2:20 pm: **Overcome the shortcoming in mobile stereoscopy**, Kwanghoon Lee, Sung-Kyu Kim, Korea Institute of Science and Technology (Korea, Republic of) . . . . . [7881A-09]

2:40 pm: **Comparative study of autostereoscopic displays for mobile devices**, Atanas R. Boev, Jyrki Häyrynen, Atanas P. Gotchev, Tampere Univ. of Technology (Finland) . . . . . [7881A-10]

3:00 pm: **Subjective evaluation of mobile 3D content: depth range versus compression artifacts**, Tomi Haustola, Satu Jumisko-Pyykkö, Atanas R. Boev, Atanas P. Gotchev, Tampere Univ. of Technology (Finland). . . . . [7881A-11]

Coffee Break . . . . . 3:20 to 3:50 pm

3:50 pm: **Development of a 3D mobile receiver for stereoscopic video and data service in T-DMB** *(Invited Paper)*, Gwangsoon Lee, Hyun Lee, KwangHee Jung, Namho Hur, Soo-In Lee, Electronics and Telecommunications Research Institute (Korea, Republic of) . [7881A-12]

4:20 pm: **A right scaled depth sense formed by using a distorted objective space based on CG stereoscopy**, Kwanghoon Lee, Korea Institute of Science and Technology (Korea, Republic of) and Konkuk Univ. (Korea, Republic of); Dong-Wook Kim, Korea Institute of Science and Technology (Korea, Republic of); Gi-Mun Um D.V.M., Eun-Young Chang, Gun Bang, Namho Hur, Electronics and Telecommunications Research Institute (Korea, Republic of); Sung-Kyu Kim, Korea Institute of Science and Technology (Korea, Republic of) . . . . . [7881A-13]

## SESSION 4

**Bayside Room B. . . . . Tues. 4:40 to 5:20 pm**

### Emerging Mobile Applications II

*Session Chair*: **David Akopian,** The Univ. of Texas at San Antonio

4:40 pm: **Smart travel guide: from internet image database to intelligent system**, Gaël Chareyron, Jérôme Da Rugna, Pôle Univ. Léonard de Vinci (France) . . . . . [7881A-14]

5:00 pm: Revised benchmarking of contact-less fingerprint scanners for forensic fingerprint detection: challenges and results for chromatic white light scanners (CWL), Stefan Kiltz, Christian Kraetzer, Jana Dittmann, Claus Vielhauer, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . [7881A-15]

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**A new mobile service: automatic lottery winning identification system**, Fei Tan, The Hong Kong Polytechnic Univ. (Hong Kong, China)[7881A-16]

**Development of testbeds for AGPS mobile applications**, David Akopian, Ganesh K. Ramachandran, Arpine Soghoyan, G. V. S. Raju, The Univ. of Texas at San Antonio (United States) . . . . . [7881A-17]

**Integrity monitoring and mobile platform implementation for WLAN positioning**, David Akopian, Sireesha Yalamanchili, Arsen Melkonyan, The Univ. of Texas at San Antonio (United States) . . . . . [7881A-18]

**Optimizing bandwidth and storage requirements for mobile images using perceptual-based JPEG recompression**, Dror Gill, Tamar Shoham, Sharon Carmel, ICVT Ltd. (Israel) . . . . . [7881A-19]

**Wi-Fi assistance to a SUPL based A-GPS simulator for indoor positioning**, Mohanapriya Chittoor Sundaramurthy, Sandesh N. Chayapathy, Abhinav Kumar, David Akopian, The Univ. of Texas at San Antonio (United States) . . . . . [7881A-20]

**mQIM principles for MPEG-4 AVC watermarking**, Mihai P. Mitrea, Marwen Hasnaoui, Maher Belhaj, Françoise J. Prêteux, TELECOM & Management SudParis (France) . . . . . [7881A-21]

**Generalized Phi number system and its applications in image decomposition and encryption**, Sarkis Agaian, Stanford Uni. (United States); Yicong Zhou, Tufts Univ. (United States). . . . . [7881A-22]

**Local polynomial approximation and local binary pattern based face classification**, Rakesh Mehta, Jirui Yuan, Karen Egiazarian, Tampere Univ. of Technology (Finland) . . . . . [7881A-23]

**Anisotropic multiscale Lucas Kanade pyramid**, Jirui Yuan, Karen Egiazarian, Tampere Univ. of Technology (Finland) . . . . . [7881A-24]

**iPhone forensics with Mac OS X based open source tools**, Reiner Creutzburg, Thomas Höne, Fachhochschule Brandenburg (Germany) . . . [7881A-25]

**Forensic investigation of certain types of mobile devices**, Reiner Creutzburg, Silas Luttenberger, Fachhochschule Brandenburg (Germany) [7881A-26]

**SENSC algorithm for object and scene categorization**, Baodi Liu, Yu-Jin Zhang, Tsinghua Univ. (China). . . . . [7881A-27]

**Parameterized logarithmic image processing model for image enhancement**, Yicong Zhou, Karen A. Panetta, Tufts Univ. (United States); Sos S. Agaian, The Univ. of Texas at San Antonio (United States). . . . . [7881A-28]

**Practical vision based degraded text recognition system**, Khader Mohammad, Sos S. Agaian, Hani Saleh, The Univ. of Texas at San Antonio (United States). . . . . [7881A-29]

**Pixel- and region-based image fusion using the parameterized logarithmic stationary wavelet transform**, Shahan C. Nercessian, Karen A. Panetta, Tufts Univ. (United States); Sos S. Agaian, The Univ. of Texas at San Antonio (United States) . . . . . [7881A-30]

**Practical automatic Arabic license plate recognition system**, Khader Mohammad, Sos S. Agaian, Hani Saleh, The Univ. of Texas at San Antonio (United States). . . . . [7881A-32]

**Background subtraction using distribution of pixel positions for intensity clusters in images**, Suil Son, Young-Woon Cha, Suk I. Yoo, Seoul National Univ. (Korea, Republic of) . . . . . [7881A-33]

**Semi-supervised classification of emotional pictures based on feature combination**, Shuo Li, Yu-Jin Zhang, Tsinghua Univ. (China) . [7881A-34]

**Color and hyperspectral imaging sensors applied to manufactured stone products**, Giuseppe Bonifazi, Silvia Serranti, Univ. degli Studi di Roma La Sapienza (Italy). . . . . [7881A-35]

**Hyperspectral sensing techniques applied to olive husks characterization**, Silvia Serranti, Giuseppe Bonifazi, Univ. degli Studi di Roma La Sapienza (Italy). . . . . [7881A-36]

**Improved image registration by using hybrid model of ML estimator and Wiener filter**, Prakash Duraisamy, Xiaohui Yuan, Yao Shen, Univ. of North Texas (United States) . . . . . [7881A-37]

**Comparative review of studies on aging effects in context of biometric authentication**, Tobias Scheidat, Juliane Heinze, Claus Vielhauer, Jana Dittmann, Christian Krätzer, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . . . [7881A-38]

# Conference 7881B

Tuesday-Wednesday 25-26 January 2011 • Part of Proceedings of SPIE Vol. 7881

# Multimedia Content Access: Algorithms and Systems V

*Conference Chairs:* **Cees G. M. Snoek,** Univ. van Amsterdam (Netherlands); **Nicu Sebe,** Univ. degli Studi di Trento (Italy); **Lyndon Kennedy,** Yahoo! Labs

*Conference Co-Chairs:* **Theo Gevers,** Univ. van Amsterdam (Netherlands); **Raimondo Schettini,** Univ. degli Studi di Milano-Bicocca (Italy); **Simone Santini,** Univ. Autónoma de Madrid (Spain)

*Program Committee:* **John Adcock,** FX Palo Alto Lab.; **Noboru Babaguchi,** Osaka Univ. (Japan); **Tat-Seng Chua,** National Univ. of Singapore (Singapore); **Matthew L. Cooper,** FX Palo Alto Lab.; **Francesco G. B. De Natale,** Univ. degli Studi di Trento (Italy); **Alberto Del Bimbo,** Univ. degli Studi di Firenze (Italy); **Jianping Fan,** The Univ. of North Carolina at Charlotte; **Yuli Gao,** Hewlett-Packard Co.; **Alan Hanjalic,** Technische Univ. Delft (Netherlands); **Alexander G. Hauptmann,** Carnegie Mellon Univ.; **Winston H. Hsu,** National Taiwan Univ. (Taiwan); **Gang Hua,** Nokia Research Ctr. Hollywood; **Xian-Sheng Hua,** Microsoft Research Asia (China); **Yu-Gang Jiang,** Columbia Univ.; **Paul H. Lewis,** Univ. of Southampton (United Kingdom); **Rainer W. Lienhart,** Univ. Augsburg (Germany); **Vasileios Mezaris,** Informatics and Telematics Institute (Greece); **Chong-Wah Ngo,** City Univ. of Hong Kong (Hong Kong, China); **Alan F. Smeaton,** Dublin City Univ. (Ireland); **John R. Smith,** IBM Thomas J. Watson Research Ctr.; **Hari Sundaram,** Arizona State Univ.; **Qi Tian,** The Univ. of Texas at San Antonio; **Luc J. Van Gool,** Katholieke Univ. Leuven (Belgium); **Dong Wang,** Hulu (China); **Meng Wang,** Microsoft Research Asia (China); **Changsheng Xu,** Institute of Automation (China); **Rong Yan,** Facebook; **Jun Yang,** Facebook

## Tuesday 25 January

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**No-reference blur estimation based on the average cone ratio in the wavelet domain**, Ljiljana Platiša, Aleksandra Pizurica, Ewout Vansteenkiste, Wilfried R. Philips, Univ. Gent (Belgium). . . . . [7881B-52]

**Texture based Markovian modelling for image retrieval**, Dalila Benboudjema, Ecole Nationale Supérieure de l'Electronique et de ses Applications (France). . . . . [7881B-53]

**Non-supervised macro segmentation of the large-scale TV videos**, Hongliang Bai, Yuan Dong, France Telecom R&D Beijing (China)[7881B-54]

## Wednesday 26 January

**Grand Peninsula Ballroom A . . . . . Wed. 8:20 to 9:20 am**

### Plenary Session and Conference Award Presentations

8:25 am: **Problems in Biological Imaging: Opportunities for Signal Processing**, Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[EI11SE-102]

## SESSION 5

**Bayside Room B. . . . . Wed. 9:30 to 10:30 am**

### Multimedia Tagging

*Session Chair*: **Cees G. M. Snoek,** Univ. van Amsterdam (Netherlands)

9:30 am: **Material classification and automatic content enrichment of images using supervised learning and knowledge bases**, Gerald Knapp, Sri A. Mallepudi, Ricardo A. Calix, Louisiana State Univ. (United States) . . . . . [7881B-39]

9:50 am: **Personal photo album summarization for global and local photo annotation**, Mattia Broilo, Francesco G. B. De Natale, Valentina Conotter, Univ. degli Studi di Trento (Italy) . . . . . [7881B-40]

10:10 am: **Event-driven people re-identification across photo collections**, Liliana Lo Presti, Marco Morana, Marco La Cascia, Univ. degli Studi di Palermo (Italy) . . . . . [7881B-41]

Coffee Break . . . . . .10:30 to 11:10 am

## SESSION 6

**Bayside Room B. . . . . Wed. 11:10 to 11:50 am**

### Keynote Presentation I

11:10 am: **Web-scale multimedia processing**, Malcom Slaney, Yahoo! Inc. (United States) . . . . . [7881B-42]

## SESSION 7

**Bayside Room B. . . . . Wed. 11:50 am to 12:30 pm**

### Multimedia Systems

*Session Chair*: **Nicu Sebe,** Univ. degli Studi di Trento (Italy)

11:50 am: **Spatially organized visualization of image query results**, Gianluigi Ciocca, Claudio Cusano, Univ. degli Studi di Milano-Bicocca (Italy); Simone Santini, Univ. Autónoma de Madrid (Spain); Raimondo Schettini, Univ. degli Studi di Milano-Bicocca (Italy). . . . . [7881B-43]

12:10 pm: **Image retrieval considering people co-occurrence relations using relevance feedback**, Kazuya Shimizu, Naoko Nitta, Noboru Babaguchi, Osaka Univ. (Japan) . . . . . [7881B-45]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 8

**Bayside Room B. . . . . Wed. 2:00 to 2:40 pm**

### Keynote Presentation II

2:00 pm: **Computer vision for ambient intelligence**, Hamid K. Aghajan, Stanford Univ. (United States). . . . . [7881B-46]

## SESSION 9

**Bayside Room B. . . . . Wed. 2:40 to 5:00 pm**

### Bay Area Multimedia

*Session Chair*: **Lyndon Kennedy,** Yahoo! Labs

2:40 pm: **Face detection and recognition in Facebook**, Rong Yan, Jun Yang, Facebook (United States) . . . . . [7881B-47]

3:00 pm: **Applications of consumer photo content understanding**, Daniel Tretter, Hui Chao, Hewlett-Packard Labs. (United States); Yuli Gao, Hewlett-Packard Co. (United States); Nic Lyons, Feng Tang, Chris Willis, Peng Wu, Jun Xiao, Tong Zhang, Xuemei Zhang, Qian Lin, Hewlett-Packard Labs. (United States). . . . . [7881B-48]

Coffee Break . . . . . 3:20 to 4:00 pm

4:00 pm: **Know your data: understanding implicit usage versus explicit action in video content classication**, Jude Yew, David A. Shamma, Yahoo (United States) . . . . . [7881B-49]

4:20 pm: **Multimedia information retrieval at FX Palo Alto Laboratory**, Matthew L. Cooper, John Adcock, Andreas Girgensohn, Jeremy Pickens, Lynn D. Wilcox, FX Palo Alto Lab. (United States) . . . . . [7881B-50]

4:40 pm: **Image and video content analysis: challenges of scale,** Jay Yagnik, Google Inc. (United States) . . . . . [7881B-51]

**Bayside Room B . . . . . Wed. 5:00 to 5:30 pm**

**Panel Discussion**

# Conference 7882

Tuesday-Wednesday 25-26 January 2011 • Proceedings of SPIE Vol. 7882

# Visual Information Processing and Communication II

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## Tuesday 25 January

**Grand Peninsula Ballroom A . . . . . Tues. 8:20 to 9:20 am**

### Plenary Session and Society Award Presentations

8:25 am: **New Dimensions in Visual Quality**, Alan C. Bovik, The Univ. of Texas at Austin (United States) . . . . . .[EI11SE-101]

## SESSION 1

**Sandpebble Room B . . . . . Tues. 9:30 to 10:30 am**

### Keynote Presentation I

9:30 am: **Visual search: a tutorial overview**, Radek Grzeszczuk, Nokia Research Ctr. (United States) . . . . . .[7882-12]

Coffee Break . . . . . .10:30 to 11:00 am

## SESSION 2

**Sandpebble Room B . . . . . .Tues. 11:00 am to 12:30 pm**

### Image and Video Coding

11:00 am: **A hybrid video codec based on extended block sizes, recursive integer transforms, improved interpolation, and flexible motion representation** *(Invited Paper)*, Marta Karczewicz, Peisong Chen, Rajan Joshi, Xianglin Wang, Wei-Jung Chien, Rahul Panchal, Muhammed Coban, In Suk Chong, Qualcomm (United States); Yuriy A. Reznik, Qualcomm Inc. (United States) . . . . . .[7882-02]

11:30 am: **Achieving H.264/AVC performance using distributed video coding combined with super-resolution**, Robert Klepko, Demin Wang, Gregory Huchet, Communications Research Ctr. Canada (Canada) . . . . . [7882-03]

11:50 am: **Real-time priority-aware transfer of SVC encoded video over MIMO communications system**, Daniela Radakovic, Yingwei Yao, Rashid Ansari, Univ. of Illinois at Chicago (United States) . . . . . .[7882-04]

12:10 pm: **Optimal power allocation and joint source-channel coding for wireless DS-CDMA visual sensor networks**, Katerina Pandremmenou, Lisimachos P. Kondi, Konstantinos E. Parsopoulos, Univ. of Ioannina (Greece) . . . . . .[7882-05]

Lunch Break . . . . . 12:30 to 1:50 pm

## SESSION 3

**Sandpebble Room B . . . . . Tues. 1:50 to 4:40 pm**

### Image and Video Processing I

1:50 pm: **A device and an algorithm for the separation of visible and near infrared signals in a monolithic silicon sensor** *(Invited Paper)*, Giacomo Langfelder, Politecnico di Milano (Italy); Thomas Malzbender, Hewlett-Packard Labs. (United States); Antonio F. Longoni, Federico Zaraga, Politecnico di Milano (Italy) . . . . . .[7882-06]

2:20 pm: **Localization of buildings with a gable roof in very-high-resolution aerial images**, Lykele Hazelhoff, CycloMedia Technology B.V. (Netherlands) and Technische Univ. Eindhoven (Netherlands); Peter H. N. de With, Technische Univ. Eindhoven (Netherlands) and CycloMedia Technology B.V. (Netherlands) . . . . . .[7882-07]

2:40 pm: **Impact of near-lossless and lossy coding on information extraction from hyperspectral data**, Agnieszka C. Miguel, Seattle Univ. (United States). . . . . .[7882-08]

3:00 pm: **Motion adaptive Kalman filter for superresolution**, Martin Richter, Fabian Nasse, Hartmut Schroeder, Technische Univ. Dortmund (Germany) . . . . . .[7882-09]

Coffee Break . . . . . 3:20 to 4:00 pm

4:00 pm: **Hyper-cube watermarking scheme**, Marc Chaumont, Dalila Goudia, William Puech, LIRMM (France). . . . . .[7882-10]

4:20 pm: **A joint JPEG2000 compression and watermarking system using a TCQ-based quantization scheme,** Dalila Goudia, Marc Chaumont, William Puech, LIRMM (France); Naima Hadj Said, Univ. Mohamed Boudiaf Des Sciences Et De La Technologie d'Oran (Algeria) . . . . . .[7882-11]

**Grand Peninsula Ballroom E . . . . . Tues. 5:30 to 8:00 pm**

### Interactive Paper and Symposium Demonstration Session

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters. . . . . 5:30 to 7:00 pm**

*Interactive papers will be placed on display after 9:00 am on Monday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 7:00 pm.*

**Depth map coding based on color motion information**, Byung Tae Oh, Samsung Advanced Institute of Technology (Korea, Republic of) and The Univ. of Southern California (United States); Ho-Cheon Wey, Dusik Park, Samsung Advanced Institute of Technology (Korea, Republic of)[7882-23]

**A color video compression technique using key frames and a low complexity color transfer**, Rakesh Agarwal, Vara P. Gude, Sumana Gupta, Indian Institute of Technology Kanpur (India) . . . . . .[7882-24]

## Wednesday 26 January

**Grand Peninsula Ballroom A . . . . . Wed. 8:20 to 9:20 am**

### Plenary Session and Conference Award Presentations

8:25 am: **Problems in Biological Imaging: Opportunities for Signal Processing**, Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[EI11SE-102]

## SESSION 4

**Sandpebble Room B . . . . . Wed. 9:30 to 10:30 am**

### Keynote Presentation II

9:30 am: **Joint design of optics and image processing for application-specific sensors: overthrowing old optical design principles in the new era of electro-optics**, David G. Stork, Ricoh Innovations, Inc. (United States) . . . . . .[7882-25]

Coffee Break . . . . . .10:30 to 11:10 am

## SESSION 5

**Sandpebble Room B . . . . . Wed. 11:10 am to 12:30 pm**

### Motion and Tracking

11:10 am: **Robust HOSVD-based multi-camera motion trajectory indexing and retrieval**, Qun Li, Xiangqiong Shi, Dan Schonfeld, Univ. of Illinois at Chicago (United States) . . . . . .[7882-13]

11:30 am: **Particle filtering with missing frames and its application to video tracking over lossy networks**, Jing Huang, Dan Schonfeld, Univ. of Illinois at Chicago (United States) . . . . . .[7882-14]

11:50 am: **Affine image registration with curve mapping**, Yong Li, Robert L. Stevenson, Univ. of Notre Dame (United States) . . . . .[7882-15]

12:10 pm: **Optimal optical flow based disparity map estimation for lossless stereo image coding**, Amit Kumar K. C., Ir. Rony M. Darazi, Benoît M. Macq, Univ. Catholique de Louvain (Belgium) . . . . . .[7882-16]

Lunch Break . . . . . 12:30 to 2:00 pm

## SESSION 6

**Sandpebble Room B . . . . . Wed. 2:00 to 4:40 pm**

### Image and Video Processing II

2:00 pm: **Background subtraction using pixel-wise adaptive learning rate for object tracking initialization**, Ka Ki Ng, Edward J. Delp III, Purdue Univ. (United States) . . . . . .[7882-17]

2:20 pm: **Background estimation and update in cluttered surveillance video via the radon transform**, Nicola Conci, Univ. degli Studi di Trento (Italy); Ebroul Izquierdo, Queen Mary, Univ. of London (United Kingdom) . . . . . .[7882-18]

2:40 pm: **People re-identification in camera networks based on probabilistic color histograms**, Angela D'Angelo, Jean-Luc E. Dugelay, EURECOM (France). . . . . .[7882-19]

3:00 pm: **Estimating the number of people in crowded scenes**, Minjin Kim, Wonjun Kim, Changick Kim, KAIST (Korea, Republic of) . . .[7882-20]

Coffee Break . . . . . 3:20 to 4:00 pm

4:00 pm: **MD/PNC with feedback for heterogeneous video multicast in lossy networks**, Adarsh K. Ramasubramonian, John W. Woods, Rensselaer Polytechnic Institute (United States) . . . . . .[7882-21]

4:20 pm: **Object-adaptive depth compensated inter-prediction for depth video coding in 3D video system**, Min-Koo Kang, Gwangju Institute of Science and Technology (Korea, Republic of); Jaejoon Lee, Ilsoon Lim, Samsung Advanced Institute of Technology (Korea, Republic of); Yo-Sung Ho, Gwangju Institute of Science and Technology (Korea, Republic of) . . . . . .[7882-22]

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